

Digitized by the Internet Archive
in 2014

<https://archive.org/details/canadiantransport1916>

Canadian Railway and Marine World

GENERAL INDEX FOR 1916

ACTON BURROWS LIMITED, PUBLISHERS
70 BOND STREET, TORONTO, CANADA

Items marked with an asterisk are accompanied by maps,
portraits or other illustrations.

STEAM RAILWAY AND GENERAL MATTER

- A**
- Adams Express Co. 126
Air Brake Association 258
Alaska Railways 400
Alberta & Great Waterways Ry.—
 Appointments 62, 104
 Development 10, 49, 106, 281
 Alberta Public Utilities Commission, Rules
 of Practice 51
Algoma Central & Hudson Bay Ry.—
 Appointments 190, 411
 Finance, Meetings, etc. 20, 137, 189, 359, 492
Algoma Eastern Ry.—
 Appointments 411
 Finance, meetings, etc. 179
 Rolling stock 185, 226
American Express Co. 126
American Railway Master Mechanics' Association,—
 Canadian officials at convention 270
 Flange and screw coupling dimensions.... 255
 Fuel economy and smoke prevention.....*268
 Locomotives,—Modernizing existing*266
 Locomotive boilers, design and maintenance 271
 Mechanical stokers 256
 Officials 272
 Pistons, valves, rings and bushes*259
 Powdered fuel on locomotives 255
 Superheater locomotives 257
 Supply exhibits 265
Anglo-American Telegraph Co. 126
Appointments, Transportation.... 22, 62, 104,
 144, 190, 234, 290, 328, 370, 411, 455, 493
Athabasca & Fort Vermillion Ry. 106, 138
Atlantic, Quebec & Western Ry. 290
Atlin Ry. 182
Audit Department and its relation to railway organization 96
- B**
- Birthdays of Transportation Men.... 6, 50, 87,
 133, 172, 216, 278, 309, 355, 394, 434, 479
Blake, W. C., Audit department and its relation to railway organization 96
Blomidon Ry. 281
Board of Railway Commissioners,—
 Car supply for western grain 491
 Collecting cartage tolls by railway companies 43
 Demurrage charges on private cars 183
 Demurrage collection at destination 274
 Eastern freight rates,—judgment 307
 Explosives, shipment by Canadians Northern Ry. 134, 146
 Fire protection on railways 236
 Flagging rules for impassable track.... 188
 Freight rates, application for increase.... 495
 Freight rate on tank and still structural material 129
 Freight tariffs, filing on less than statutory notice 453
 Grain congestion in Goose Lake District.. 140
 Handling milling-in-transit grain 18
 Hand rails for locomotives and tenders.. 407, 435
 Joint freight rates and concurrence notices 45
 Joint tariffs, cancellation forbidden 496
 Lights for cars and locomotives on main track 133
 Lumber on flat cars, minimum weights.... 324
 Orders by, summaries of 289
 8, 65, 90, 149, 192, 220, 292, 314, 356, 398, 440
 Release form for beer shipments 7
 Safety appliances, extension of time for installing 277
 Sittings of 289
 Telegraph tolls 211
 Traffic interchange with Canadian Northern Ry. 136
 Traffic Orders 11, 53,
 99, 146, 179, 237, 282, 329, 372, 402, 450, 497
Book Reviews 87, 211 371
Boston & Maine Rd. 453
- Bridge floor with old guard rails*352
Burard Inlet Tunnel & Bridge Co..49 182, 317, 416
- C**
- Calgary & Edmonton Ry. 138
Campbellford, Lake Ontario & Western Ry.
 Construction Suit 137
Canada's business prosperity 21, 61
Canada Southern Ry. 20, 280
Canada Western Ry. 138
Canadian Car Service Bureau 352
Canadian Express Co. 81, 113, 126, 132, 168, 212, 254, 347, 396, 463
Canadian Freight Association 188, 416
Canadian Government Railways,—
 Appointments 22, 62, 144, 328, 370, 411, 455, 493
 Claims, small, against 230
 Development 184
 Fort William business 313
 Locomotives 316, *435
 Mileage, operation, etc. 180
 Officials' salaries, etc. 183, 233
 Quebec station*360
 Rolling stock 15, 51,
 94, 139, 178, 185, 226, 291, 320, 360, 404, 451
 Snow ploughs 479
 Stock cars*276
 Wages 285
Canadian Northern Alberta Ry. 94
Canadian Northern Express Co.
 126, 168, 243, 254, 306, 347, 463
Canadian Northern Ontario Ry.—
 Development 12, 145, 178, 360, 409, 452, 490
 Finance, meetings, etc. 137
Canadian Northern Pacific Ry.
 12, 54, 145, 178, 278, 361, 409, 452, 490
Canadian Northern Quebec Ry. 12, 490
Canadian Northern Ry.—
 Aid by Dominion Government 224
 Appointments 22, 62,
 104, 144, 190, 234, 290, 328, 370, 411, 455, 493
 Cars,—sleeping, dining and observation, com-

Construction	12, 54, 94, 145, 178, 278, 325, 361, 409, 452, 490
Earnings	17, 54, 99, 141, 185, 236, 274, 320, 371, 401, 451, 495
Explosives, shipments of	134, 146
Finance, meetings, etc.	91, 179, 313, 359, 399, 453
Grain congestion in Goose Lake District	140
Making fill from pontoon bridge	*46
Niagara Peninsula railway interests	117, 153, 221
Passenger cars for transcontinental service	*83
Port Mann shops	108
Report, annual	412
Riviere des Prairies bridge	*2
Rolling stock	15, 51, 94, 139, 185, 226, 320, 360, 404, 485
Securities	289
Step ladder for sleeping cars	*43
Tank cars	*131
Traffic interchange	136
Vancouver station	273, *358
Canadian Northern Telegraph Co.	254
Canadian Overseas Railway Construction Corps	87, 226
Canadian Pacific Ry.—	
Additions and improvements, expenditures on	439
Appointments	22, 62, 104, 144, 190, 234, 290, 328, 370, 411, 455, 493
Bridge engineering features in British Columbia	*367
Changes in names of divisions	454
Colonization plans	146
Developments	10, 49, 91, 138, 182, 222, 285, 331, 361, 403, 441, 492
Earnings, etc.	17, 54, 99, 141, 185, 236, 274, 320, 359, 371, 401, 451, 495
Earnings, remarkable	107
Engineering Department plan room	*349
Finance, meetings, etc.	20, 52, 91, 399
Handling service telegrams and mailgrams	53
Honor roll	16, 98, 232, 324, 410, 440, 481
Inspection trip	404
Mileage, etc.	394
North Toronto station	*287, *361
Officials' meeting at Winnipeg	366
Pension fund	394
Quebec station	*360, *403
Report, annual, and meeting	396, 442
Rogers Pass tunnel construction	15, 61, 103, 137, *169, 176, 315
Rogers Pass tunnel, cost and speed of construction	11, 274, 318, 357
Rogers Pass tunnel, Was tunnel advisable?	183
Rolling stock	15, 51, 94, 139, 185, 226, 320, 451, 485
Scholarships	233, 274
Scientific research work	221
Spokane International Ry., rumored purchase	494
Telegraph efficiency	147
Telegraphs	254, 299, 390, 409, 432, 456
Track section prize competition	16
Traffic statistics	438
Tree windbreaks	7
Wages increase to western shop employees	373
Welding at Winnipeg shops	*395
Canadian Railway Club	102, 176, 184, 233, 439
Canadian railways, gross earnings of	*439
Canadian Society of Civil Engineers	4, 102, 171, 184, 231, 233, 365, 473
Canadian Terminal Ry.	49
Canadian Ticket Agents' Association	103, 131, 177, 289
Canadian Transfer Co.	99
Canmore Ry.	106, 222
Canton & Grand Lake Ry.	138, 182
Cape Breton Ry.	364
Car building plant at Fort William, proposed removal	188
Carroll, J. M. S.—Use of rubber goods in railway service	217
Car supply for western grain shipments	491
Cars.—Passenger car construction and design, improvements in	*92
Carter, G. W.—Handling railway service telegrams and mailgrams	53
Cascade Scenic Ry.	484
Central Canada Ry.—	
Appointments	63
Development	10, 49, 106
Central Ry. of Canada	52, 232, 315, 492
Central Vermont Ry.—	
Appointments	290, 328
Development	222
Finance, meetings, etc.	280
Rolling stock	51
Central Western Canada Ry.	49
Chapman, W. P., Outside frictionless rails for curves	*213
Chicago, Milwaukee & St. Paul Ry.	455
Chicago terminals, electrification difficulties	7
Churchill Southern Ry.	49, 106
Columbia & Western Ry. land grants	176
Commercial Cable Co.	432
Construction battalion for overseas	235, *279
Delaware & Hudson Co.'s report	277
Detroit, Grand Haven & Milwaukee Ry. earnings	108, *127
ings	17, 54, 99, 141, 185, 236, 274, 320, 371, 401, 451, 495
Diamond Coal Co.'s Railway	179
Dominion Atlantic Ry.—	
Appointments	235, 494
Development	364, 447
Finance, meetings, etc.	400
Dominion Express Co.	21, 42, 82, 91, 126, 168, 254, 306, 348, 463
Dominion Government Telegraphs	254, 348
Dominion Telegraph Co.	348
Downey, W.—Spring and summer track work	177
Drawbridge post spindle breakage	*52
Drayton, Sir Henry L.—Analysis of increases in railway operating expenses	351
Duluth, South Shore & Atlantic Ry.	63, 144, 360
Duluth, Winnipeg & Pacific Ry.—	
Appointments	104, 144, 370
Rolling stock	320, 438
Dunn, S. O.—Government versus private ownership of railways	473
Eastern Canadian Passenger Association	50, 53, 183
Eastern British Columbia Ry.	23
Edmonton & South Western Ry.	182
Edmonton, Dunvegan & British Columbia Ry.	
Appointments	23, 63
Development	10, 49, 106, 182, 281, 317, 364, 446
Efficiency testing	403
Engineers' Club of Montreal	278
Esquimalt & Nanaimo Ry.	357, 484
Essex Terminal Ry.	20, 49, 138, 222
Express Companies, Among the	81, 126, 168, 212, 254, 306, 347, 463, 498
Express Companies' statistics	212
Express rates on fruit, Oregon to Manitoba	313
Express Traffic Association of Canada	456
Farnham & Granby Ry.	182
Fort William elevator tracklaying dispute	9
Fort William Terminal Development Co.	280
Fort William terminal facilities for grain	323, 410
Freight and Passenger Traffic Notes	12, 52, 109, 148, 184, 223, 286, 318, 357, 401, 446, 492
Freight classification ratings in U.S.	66
Freight rate increases in U.S.	50
Freight rates and interswitching in British Columbia	64
Freight tariffs, filing on less than statutory notice	453
French State Railways,—Freight cars	*130
Gananogue & Arnprior Ry.	106, 222
Grain congestion in Goose Lake District	140
Grain inspection at western points	103, 143, 188, 233, 277, 330, 413, 449
Grain in store at terminal elevators	20, 122, 148, 185, 252, 305, 371, 430, 443, 496
Grain moved from prairie provinces by railway	66
Grain trade enquiry	291
Grand Lake Ry. & Transportation Co.	446
Grand Trunk Pacific Ry.—	
Aid by Dominion Government	224
Annual meeting	409
Appointments	23, 63
Development	105, 144, 191, 235, 291, 328, 371, 411, 455, 494
Earnings	17, 54, 99, 141, 185, 236, 274, 320, 451, 495
Finance, meetings, etc.	359, 443
Improvements	23
Rolling stock	51, 291, 320
Grand Trunk Pacific Telegraph Co.	30, 254
Grand Trunk Ry.—	
Appointments	23, 63, 104, 144, 190, 235, 290, 328, 370, 411, 455
Apprentices examinations	273, 494
Black Rock station and office building	*330
Bonaventure station, Montreal, fire at	*141
Development	10, 49
Earnings	106, 138, 182, 222, 281, 317, 364, 400, 447, 484
Finance, meetings, etc.	17, 54, 99, 141, 145, 185, 236, 274, 320, 371, 401, 451, 495
First aid work	15
G.T.R. and New York, New Haven & Hartford Rd.	16
Report	220
Rolling stock	15, 94, 139
Steel suburban cars	*44
Track inspection	446
Train men, advice to	214
Grand Trunk Western Ry. earnings	17, 54, 99, 141, 236, 274, 320, 371, 451, 495
Rates	360
Greater Winnipeg Water District Ry.	10, 137, 447
Great Northern Ry.—	
Appointments	191, 235
Development	10, 49, 106, 182, 222, 281, 317, 364, 400, 447, 484
Reports	5, 478
Great Northern Mining & Ry. Co.	52, 315
Great North Western Telegraph Co.	43, 81, 126, 254, 299, 348, 390, 432, 456, 463
Guelph Jct. Ry.	280
Hamilton, Ont., track elevation or depression	108, *127
Harris, R. W. D., What efficiency testing really means	403
Henry, M.—Tie renewals and distribution	6
High River, Saskatchewan & Hudson Bay Ry.	106, 138, 222, 281
Hudson Bay, Peace River & Pacific Ry.	182
Hudson Bay Ry. (Dominion Government)	10, 106, 219, 222, 281, 364, 400, 447, 484
Illinois Central Rd.	191
Imperial Rolling Stock Co.	357
Intercolonial Ry.—	
Appointments	23, 64, 371, 412
Development	10, 106, 138, 182, 231, 281, 317, 364, 400, 447, 484
Elevator at St. John, N.B.	478
Hospital train	23
(See also Canadian Government Railways)	
International Railway Fuel Association	226, 260
Inverness Ry. & Coal Co.	359
James Bay & Eastern Ry.	145
Joliette & Lake Manuan Colonization Ry.	49, 182
Kettle Valley Ry.	10, 49, 182, 222, 317, 364
Klondike Mines Ry.	399
Kootenay & Alberta Ry.	106, 400
Labor problem, co-operation as a means of solving	325
Lachine, Jacques Cartier & Maisonneuve Ry.	484
Lake Huron & Northern Ontario Ry.	138, 182
Lake Superior Corporation's subsidiary transportation companies	477
Lewish Valley Rd.	494
Lewis, S.—Thermit welding in N.T.R. shops	*353
Lights for cars and locomotives on main tracks	137
Live stock transportation in U.S.	18
Lockport Ry.	222
Locomotive flange oiling	482
Locomotive fuel coal tests	483
Locomotives,—French Government double bogie	*363
Hand rails for	401, 419
Relation between tractive effort and adhesive weight	5
Russian, built in Canada	*19
Lumber rates	109
McCooe, D.—Co-operation as a means of solving labor problem	325
McManama, J. W.—Selection and education of section forces	365
McVeigh, E. J.—Handling of railway scrap or salvage	392
Magdalene River Ry.	107
Magnetawan River Ry.	399
Mainly About Railway People	13, 57
100, 142, 186, 228, 282, 321, 362, 405, 448, 480	
Manitoba-Ontario Ry.	49, 281
Manitoba Public Utilities Commission	107
Marconi Wireless Telegraph Co.	432
81, 126, 348, 390, 433	
Maritime Coal, Ry. & Power Co.	231, 400
Margaree Coal & Ry. Co.	281
Master Car Builders' Association.—	
Canadian officials at convention	270
Car construction	255
Car trucks	257
Car wheels	*26
Officials	273
Safety appliances	255
Settlement prices for reinforced wooden cars	256
Supply exhibits	263
Welding cast steel truck frames and bolsters	258
Michigan Central Rd.—	
Appointments	105, 235, 291, 412, 455
Development	182, 222, 281, 317
Finance, meetings, etc.	91, 137
Rolling stock	51, 481
Tool and derrick car	*329
Mineral Range Rd.	14
Minneapolis, St. Paul & Sault Ste. Marie Ry.—	
Appointments	191, 235
Development	10, 222
Finance, meetings, etc.	173
Rolling stock	481
Moncton & Buctouche Ry.	10
Montreal,—proposed union station	230
Montreal & Province Line	399
Montreal Central Terminal Ry.	222, 281
Montreal Telegraph Co.	120
Montreal Tunnel & Terminal Co.	278, 325, 409, 452, 490
Montreal Warehousing Co.	131
Morrissey, Fernie & Michel Ry.	179
Naas & Skeena Rivers Ry.	10
National Transcontinental Ry.—	
Appointments	23, 64, 105, 144, 235, 291, 328, 371
Cost of	147
Development	107, 138, 182, 281, 317, 364
Elevator at Transcona	433
Grain shipments	147
High level air pump at Quebec	*363
Operation	363

Port Arthur connection	413	Railway industry, magnitude of	85	Roberval-Saguenay Ry.	139
Shell making at Transcona shops	17	Railway land grants extended by Quebec Legislature	181	Rubber goods in railway service	*217
Tank car for fire fighting	*42	Railway lands patented	17, 102, 147, 215, 285, 348, 359, 404, 451, 489	S	
Thermit welding at Transcona shops	*353	Railway location and construction through muskeg swamps	*433	St. Francis Valley Ry.	50, 139
Transcona shops	109	Railway location economics	176	St. John & Quebec Ry.—	
Winter grain rates	17	Railway materials and supplies, increase in prices	232	Appointments	64
(See also Canadian Government Railways)		Railway Mechanical Methods and Devices.—		Development	11, 54, 139, 183, 280, 318, 364, 447, 484
New Brunswick & Prince Edward Island Ry.	231	Adjustable driving device for lathe	*47	Finance, meetings, etc.	91, 231, 400
Newfoundland Ry. and Train Ferry Syndicate.	10	Auxiliary chuck for piston packing rings	*396	St. Lawrence & Adirondack Ry.	20
New York Central Rd.—		Boring chime whistles	*135	Section forces, selection and education of	369
Appointments	64, 191, 291, 412, 456	Boring stuffing boxes	*3	Skeels, E. B.—Unique engineering features of C.P.R. bridge	*367
Canadian lines leased	232	Bucket guard for gears	*48	Southern New England Ry.	222, 447
Niagara & Eastern Ry.	447	Car wheel handling truck	*89	Spokane & British Columbia Ry.	137
Niagara Frontier Summer Rate Committee ..	66	Casting valve gland packing rings	*135	Standard lettering of freight cars	*41
Nigerian Railway freight cars	*133, *438	Cleaning water filters	*396	Sullivan, J. G.—Cost and speed of constructing Rogers Pass tunnel	183
Nova Scotia Coal, Iron & Ry. Co.	400	Coal oil storage tank	*89	Methods adopted in construction of Rogers Pass tunnel	*169
Nystrom, K. F.—Improvements in passenger car construction and design	*92	Cutting off rivet heads	*3	T	
O		Cutting out tubes	*4	Taber Transit Co.	139, 222
Ontario Niagara Connecting Bridge Co.	11, 138, 182	Drawbar rivet shearing machine	*215	Tariffs, joint, cancellation forbidden	496
Oregon-Washington Rd. & Navigation Co.	291	Drip pans for presses	*215	Telegraph, Telephone and Cable Matters ..	
Ottawa & New York Ry.	20	Grease press	*483	.....51, 126, 254, 299, 348, 390, 432, 456, 498	
Ottawa Terminals Ry.	453	Home made bar bender	*3	Telegraph tolls	211
P		Hose band opener	*135	Temiscouata Ry.	91, 137, 199
Pacific Cable Board	81	Hydraulic pressure control for tube testing	*48	.....231, 280, 315, 359, 399, 492	
Pacific Great Eastern Ry.—		Hydraulic tube end expanding machine	*88	Thermit welding at National Transcontinental Ry. shops	*353
Annual meetings	7, 456	Laying off segmental packing rings	*88	Ticket salesmanship	214
Development	11, 49, 107, 138, 183, 282, 317, 364, 400, 447, 484	Locomotive stack crane	*4	Tie renewals and distribution	6
Finance, meetings, etc.	407	Locomotive washing	*310	Ties, British Columbia, tests made in England	134, 189
Litigation	274, 358	Long arm grinder	*311	Timiskaming & Northern Ontario Ry.—	
Location and construction	*308	Machining bushings	*175	Appointments	329
Pacific, Peace River & Athabaska Ry.	183	Machining hub liners	*89	Finance, meetings, etc.	137, 483
Paris, Lyons & Mediterranean Ry. freight cars	*173	Magnetic separator	*482	Report	231
Passenger fares in U.S. increased	18	Oxy-acetylene welding	*175	Rolling stock	51, 94, 139, 291, 451
Passenger rate meetings at Buffalo, N.Y.	66	Piston rod drift pin	*48	Toronto as a railway centre	323
Peace River Tramway & Navigation Co.	11, 138, 183, 484	Piston rod V blocks on planer	*396	Toronto Belt Line Ry.	280
Pere Marquette Rd.—		Racks for triple valves	*47	Toronto city industrial sidings	485
Appointments	23, 64, 456	Removing and mounting wheel tires	*216	Toronto, Hamilton & Buffalo Ry.—	
Development	49, 401	Ring centring jig	*437	Appointments	64
Finance, meetings, etc.	137	Riveting dolly	*436	Development	50, 139, 223, 282
Pickles, J. L.—Railway location and construction through muskeg swamps	*434	Salvaging shears and hammer	*89	Finance, meetings, etc.	91, 280, 359, 453
Port Arthur—Terminal facilities for grain ..	323	Small rod jigs	*437	Grade separation in Hamilton	108, *127
Powers, J. W.—Causes and preventatives of heaving track	95	Stationary locomotive stack blower	*215	Report	327
Spring track work	132	Straddle milling tender axle boxes	*310	Wages	12, 94
Prince Edward Island Ry.—		Stripping spring buckles	*3	Toronto, Niagara & Western Ry.	485
Appointments	64, 235, 494	Taper test pin block	*437	Toronto railway viaduct	443
Development	138, 182, 223, 364, 484	Testing air valves	*175	Toronto Terminals Co.	11, 139, 282, 443
(See also Canadian Government Railways)		Vacuum cleaner	*176	Track heaving, causes and preventatives ..	95
Q		Vise for triple valves	351	Track work, spring and summer	132, 177
Quebec & Saguenay Ry.	15, 183, 317, 359, 447	Railway operating expenses, analysis of increases	108	Trade and Supply Notes 82, 254, 306, 348, 472, 512	
Quebec Bridge	107, 191, 223, 282, 317, 364, *414, *417, 447	Railway profiles based on mean sea level ..	56, 108	Transportation Club of Vancouver ..	147, 280, 357
Quebec Central Ry.—		Railway rolling stock notes	15, 51, 94, 139, 185, 226, 291, 320, 360, 404, 451, 485	Transportation interests' pre-eminent position.	61
Appointments	145	Railway scrap or salvage, handling of	391	U	
Development	11, 50, 138	Railway situation, Royal Commission to enquire into	230, 318, 359, 408, 445	Union Pacific Rd.	371
Rolling stock	485	Railway statistics	174, 218, 312	United States Express Co.	306
Quebec, Montreal & Southern Ry.	11, 139, 447	Railway taxation in Manitoba	102	V	
Quebec Transportation Club	291	Railway track laid in 1915	15, 60, 105, 133	Vancouver Terminal Ry.	401
R		Railway tracklaying record in Canada	61	Venezuela railways	128
Rail orders	18	Railway turnout problem	*326	W	
Rails, steel, and customs duty	441	Railways,—fire protection on	237	Wabash Ry.—	
Rails, outside frictionless, for curves	*214	Railways,—government directors	315	Appointments	23, 64, 105, 144
Railway accommodation at Camp Borden ..	273	Railways,—government versus private ownership	473	Development	50
Railway and steamship bill of lading combined ..	478	Railways, Quebec, acquired by Dominion Government	227	Water distiller, a simple	*60
Railway building in China by Americans	478	Rates, freight, application for increases	495	Weather conditions in the west	108
Railway construction aid, Alberta	146	Rates, freight, Eastern case, judgment	307	Weighing carload freight at Detroit	146
Railway construction aid, Dominion	187	Rates, freight, increases in western U. S., classification territory	147	Welding in C.P.R. Winnipeg shops	*395
Railway Construction Battalion	277	Rates, freight, lake and rail cancellations forbidden	191	Welding in railway shops, savings effected ..	310
Railway Development	10, 49, 106, 138, 182, 222, 281, 317, 364, 400, 447, 484	Rates, freight, on tank and still structural material	129	Welland Ship Canal Construction Railway ..	*1
Railway earnings	17, 54, 99, 141, 185, 236, 274, 320, 371, 401, 451, 495	Rates, grain, Saskatchewan to Minnesota ..	331	Western Canada Railway Club	54
Railway earnings and expenses in U.S.	318	Rates, passenger, Toronto-Port Arthur summer fares reduced	320	Western Union Telegraph Co.	126, 348, 390
Railway finance, meetings, etc.	20, 52, 91, 137, 179, 231, 280, 315, 359, 399, 452, 492	Reid Newfoundland Co.—		White Pass & Yukon Ry.—	
Railway freight statistics	8	Development	11	Annual meeting	64
		Finance, meetings, etc.	191	Finance, meetings, etc.	20, 52, 137, 231, 359, 399, 492
		Richardson, A. G.—Ticket salesmanship ..	214	Winnipeg Traffic Club	147
				Winnipeg Transportation Social Club	54

ELECTRIC RAILWAY DEPARTMENT.

A		British Columbia Electric Ry.—		Car equipment, recent developments	150, 193
Alien's right to sue as a tutor in Quebec ..	500	Annual report	69	Cars, one-man operation	337
American Electric Railway Association	26	Bulletins	298	Charlottetown Street Car Co.	242
Answers to Questions	31, 242, 380, 459	Development	30, 156, 242, 379, 425, 460, 502	Chatham, Wallaceburg & Lake Erie Ry.—	
Athabasca Power Co.	70	Finance, meetings, etc.	31, 74, 117, 157, 199, 241, 297, 339, 379, 423, 462, 504	Appointments	144
B		Jitney business	501	Development	30
Berlin & Northern Ry.	460	Safety first prize sentences	500	Chestermere & Calgary Suburban Ry.	73
Berlin & Waterloo St. Ry.	113	Testing air brakes	*297	Concrete header along rails, cost of	*75
Brandon Municipal Ry.—		Vancouver car schedules	73	Concrete poles for electric railways	70
Construction costs	242	Buffalo & Fort Erie Ferry & Rd. Co. 73, 151, 242		D	
Development	421	C		Detroit United Ry.—interurban service	374
Finance	423, 459	Calgary Municipal Ry.—		Dominion Power & Transmission Co.—	
Meters, use of	26	Development	200, 242, 295, 378, 425, 502	Annual report	197
Brantford & Hamilton Ry.—		Finance	152, 199, 422, 504	Development	425
Brantford union station	*240	Future of	337	Finance, meetings, etc.	462
Development	200, 460, 502	Organization	29	Rolling stock	380
Brantford Municipal Ry.—		Wage schedule	112	Shareholder's suit	461
Commission	72	Canadian Electric Railway Association,—		E	
Development	115, 154, 200, 379, 425, 502	Officials	330	Edmonton,—hydro electric power projects ..	155
Finance	31, 117, 127, 199	Officials	340	Edmonton & South Western Ry.	73
Report	199	Cape Breton Electric Co.		Edmonton Interurban Ry.	73, 156
Wages	294	31, 74, 117, 157, 241, 297, 339, 423, 462, 504			

Edmonton Power Co.'s railway projects	72, 115
Edmonton Radial Ry.—	
Development	30, 379, 460, 502
Finance	31, 112, 195, 298, 459
Electric railway traffic, and regulation of vehicle traffic	241
Employees, electric railway, six-day week for	337

Ferris, H. R.—Cost of concrete header along rails	*75
Finance, meetings, etc.	31, 74, 117, 157, 199, 241, 297, 339, 379, 423, 462, 504
Fort William Electric Ry.—	
Development	400
Wages	423

Gordon, W. G.—Recent developments in electric car equipment	150, 193
Grand Valley Ry.	241
Great Lakes Power Co.	298
Guelph Radial Ry.—	
Development	425
Finance	31
Wages	425

Halifax Electric Tramway Co.—	
Development	156, 502
Finance, meetings, etc.	423
Hamilton, Grimsby & Beamsville Electric Ry.	
Development	378
Lavatory accommodation on cars	377, 421
Hamilton Radial Ry.	30, 112
Hamilton St. Ry.—	
Development	295
Finance, meetings, etc.	117, 504
Hull Electric Co.	156, 425, 502
Hydro Electric Power Commission of Ontario, proposed radial railways	*27, 76, 151, 195, 243, 337, 378, 379, 424, 459, 502

International Transit Co.	244
Interurban railways, platforms for	239

Jitney situation in Canada	28, 29, 70, 114
Jitney Traffic Notes	152, 241, 299, 337, 377, 424

Kingston, Portsmouth & Cataraqui Electric St. Ry.—	
Fare changes	294
Wages	115

Lacombe & Blindman Valley Electric Ry.	30, 156, 183
Lake Erie & Northern Ry.—	
Brantford union station	*240
Cars	*67, 139, *112, 115
Development	156, 200, 242, 295, 338, 378, 425, 460
Electricification	*457
Electric locomotives	*71
Finance, meetings, etc.	504
Grand Valley Ry. purchase	28, 76
Operation	112
Portable substation	*239
Lethbridge Municipal Ry.—	
Finance	117, 199, 336
One-man car operation	240
Levis County Ry.	339, 462
London & Lake Erie Ry. & Transportation Co.	30, 73, 378
London & Port Stanley Ry.—	
Car barn	29
Cars	499
Development	30, 73, 156, 295, 338, 378, 425, 460
Finance	31, 72, 339, 379, 500
Michigan Central Rd. traffic	29, 66
Operation, equipment, etc.	463
Summer traffic rates	111
London St. Ry.—	
Development	115, 378, 460
Finance, meetings, etc.	31, 74, 117, 379, 423, 504
Report	113
Sunday service	299

Algoma Central Steamship Line	104
American Association of Port Authorities	430
Atlantic and Pacific Ocean Notes	37, 79, 120, 163, 205, 249, 302, 344, 386, 428, 468, 510

Batiscan-Bengore Head collision damages	104
British Columbia and Pacific Coast Notes	38, 80, 121, 164, 207, 250, 303, 345, 388, 429, 470, 512
British Columbia Merchant Marine Ltd.	81, 119
British Columbia shipping legislation	508
British vessels trading between foreign ports	36

Canada Steamship Lines Ltd.—	
Appointments	144, 190, 204, 234, 290, 411
Notes	34, 68, 246, 305, 345, 385, 430, 471
Organization	162

Moncton Tramways, Electricity & Gas Co.—	
Annual meeting	117, 199
Development	30, 73, 295, 338, 425
Rolling stock	195
Montreal & Southern Counties Ry.—	
Development	30, 156, 242, 338, 460
Extension, St. Cesaire to Granby	*332
Finance, meetings, etc.	462
Montreal & Southwestern Ry.	73
Montreal Tramways Co.—	
Conduits	421
Development	73, 242, 295, 460, 502
Finance, meetings, etc.	378, 423
Franchise	329, 380, 422
Munition manufacturing	29
Mutual Benefit Association	380
Report	375
Wages	298
Moose Jaw Electric Ry.—Wages	503
Morrisburg & Ottawa Electric Ry.	73, 115, 200, 239, 297, 460
Mount McKay & Kakabeka Falls Ry.	115, 156, 242
Municipal electric railways in Western Canada	461

Nelson St. Ry.	200, 242
Niagara Falls Park & River Ry.—	
Accident	73, 242
Compensation for injuries	155
Safety provisions	296, 424
Niagara Peninsula railway charters, extension opposed	117, 153
Niagara, St. Catharines & Toronto Ry.—	
Appointments	329
Development	30, 200
Nipissing Central Ry.	157, 200
Notes	32, 75, 117, 152, 201, 244, 299, 340, 380, 423, 463, 504
Nova Scotia Tramways & Power Co.	74, 115

Ontario West Shore Ry.	499
Oshawa Ry.—	
Development	73, 425, 502
Rolling stock	299, *500
Ottawa Electric Ry.—	
Accident case	116
Development	200, 242, 502
Safety first	114
Wage agreement	335
Ottawa Traction Co., annual meeting	111

Personal	32, 74, 116, 157, 198, 244, 296, 339, 378, 422, 462, 503
Peterborough Radial Ry.—	
Sale of	154, 240, 421
Pictou County Electric Co.	295
Porcupine Rand Belt Electric Ry.	460
Port Arthur Civic Ry.—	
Development	200, 338, 502
Finance	199, 297, 339, 504
Rolling stock	201
Work car	152
Postmen, transportation of	76, 504
Projects, construction, betterments, etc.	30, 73, 115, 156, 200, 242, 295, 338, 379, 425, 460, 502
Public utilities and the public	503

Quebec Ry., Light & Power Co.—	
Accident talks	459
Development	295, 338, 460
Report and meeting	422
Rolling stock	201, 504

Regina Municipal Ry.—	
Damage liability	70
Development	295
Finance	30, 151, 201, 294, 334, 375, 459, 503
Transportation of postmen	504

St. Clair Tunnel electrification data	68
St. John Ry.—	
Annual report	197
Development	73, 156, 200, 460
Franchise and rights	154

MARINE DEPARTMENT.

s.s. W. C. Moreland, rebuilding of	384
Canada West Coast Navigation Co. Ltd.	346, 386
Canada's Mercantile Marine, its development and future	340
Canadian Atlantic ocean mail port	35
Canadian Import Co.'s vessels	369
Canadian Lake Protective Association	123, 431
Canadian Northern Ry. car floats	427
Canadian Northern Steamships Ltd., sale of vessels	247
Canadian Pacific Ocean Services Ltd.	22, 62, 104, 144, 235, 328, 370, 432, 455
Canadian Pacific Ry. Great Lakes steamships	253
Canal statistics for 1915	246
Certified officers on motor vessels	209
Coast, Lake and River Officers for 1916	158, 210
Coastwise Steamship & Barge Co. Ltd.	79
Collisions with navy vessels, regulations regarding	466

St. Thomas St. Ry.	199
Sandwich, Windsor & Amherstburg Ry.—	
Attempted confiscation	241
Development	295, 425
Difficulties in Walkerville	377
Franchise	68
Rolling stock	32, 152, 201, 380, 503
Wages	461, 501
Sarnia St. Ry.	30, 338
Saskatoon Municipal Ry.—	
Development	338, 378, 425, 502
Finance	28, 75, 151, 157, 189, 199, 458
Officials	111
Sault Ste. Marie Electric Ry.	156
Schomberg & Aurora Ry.	30, 73
Shawinigan Water & Power Co.	68, 113
Sherbrooke Ry. & Power Co.—	
Development	194
Finance, meetings, etc.	199, 297, 423, 463, 504
Report	458
Rolling stock	117
Snow plough operation, difficulties of	334
South East Calgary Electric Ry.	29
Statistics	238
Sudbury-Copper Cliff Suburban Electric Ry.—	
Cars	117
Development	115, 156, 377, 378, 425, 502
Finance, meetings, etc.	423

Taxation in Manitoba	200
Three Rivers Traction Co.—	
Development	73, 115, 156, 425, 500
Line opened	28
Rolling stock	201, 299
Toronto, Advisory transportation committee	154
Radial entrances, report on	*24
Toronto & York Radial Ry.—	
Farnham Ave. diversion appeal	151, 461
Finance, meetings, etc.	31, 74, 200, 241, 297, 339, 379, 423, 462, 504
Toronto, Barrie & Orillia Ry.	115
Toronto Civic Ry.—	
Cars	72, 151, 236, 297, 504
Development	30, 242, 295, 338, 425, 460
Earnings	151, 152, 157, 241
Toronto Ry.—	
Cars	111
and City of Toronto	155
Development	460
Finance, meetings, etc.	31, 74, 117, 157, 199, 240, 241, 297, 339, 379, 423, 462, 504
Free transportation for soldiers	74
Outside running board	75
Report	113
Rights on Yonge St.	294, 336
Toronto Suburban Ry.—	
Car barn at Lambton	*196
Cars, interurban	*110, 152
Change of gauge	376
Development	30, 156, 295, 425, 463, 502
Franchises	115, 198
Lambton diversion	299, 334, 424
Office building	194
Track laid in 1915	30, 75
Transcona, Man., electric railway project	338, 502

Vancouver jitney situation	504
Van Zandt, A. D. B., Detroit's interurban service	374
Vercheres, Chambly & La Prairie Tramways Co.	73, 156

Weeding on interurban railways	299
Western Canada Power Co.	425
Windsor, Essex & Lake Shore Rapid Ry.—	
Appointments	194
Development	30, 115, 295, 425
Winnipeg.—	
Car operation on bridge approaches	*293
Winnipeg Electric Ry.—	
Automobile collisions	111
Development	30, 156, 200, 242, 295, 338, 378, 425
Finance, meetings, etc.	31, 74, 117, 153, 200, 241, 297, 339, 379, 423, 462, 504
Jitney competition	422
Winnipeg, Selkirk & Lake Winnipeg Ry.	31

Deutschland, German submersible vessel	383
Dominion Government dredge for St. Lawrence Ship Channel	381, 508
Dominion Government icebreaking s.s. J. D. Hazen for St. Lawrence	68, *202, *245
Dominion Government s.s. Minto sold to Russia	36
Dominion Government shipping rumors	512
Dominion Government steamships and ice-breakers	119
Dominion Government vessel building at Sorel	*505
Dominion Marine Association and the U.S. Seamen's Act	211
Dominion Marine Association, annual meeting	125
Dry dock projects at Vancouver	118

Empress of Britain-Helvetic collision, judgment	36
---	----

F	
Family tickets on ferries	35
Fort William, shipping letters	161
Furness, Withy & Co., report	384

G	
Grain Clearance Association	162
Grand Trunk Pacific Coast Steamship Co.—	
Appointments	371
Steamship records	79
Great Lakes & St. Lawrence River Rate Com-	
mittee	66
Great Lakes Transit Co.	205
Great Lakes Transportation Co.'s new vessel	347
Great Lakes vessels in ocean and coasting	
trade	119
Great Northern Pacific Steamship Co.	191

H	
Hudson Bay navigation and the port of Que-	
bec	36

I	
Ice patrol in North Atlantic Ocean	168
Imperial Merchant Service Guild	79
Imperial Oil Co.'s steel tank vessels	163
Intercolonial Ry. ferry s.s. Scotia No. 2	93
International Joint Waterways Commission	131
International Mercantile Marine Co.	384, 465
International Water Lines Passenger Asso-	
ciation	66
Interstate Commerce Commission and lake	
traffic	25

L	
Lake freight steamships sold for ocean service	
Leonard, R. W.—Economic and strategic as-	
pects of Welland and Georgian Bay Canals	165
Licensing Canadian vessels for foreign busi-	
ness	209
Lighthouse Board of Canada	161
Lights and fog alarms	167
Livingstone channel regulations	472
Longshoremen and shipping companies at St.	
John	159
Longshoremen's agreement at Montreal	210
Longshoremen's dispute at St. John	79

M	
Manitoba, Saskatchewan and Alberta Notes	
.....164, 250, 303, 345, 429, 512	
Marine votes for 1916-1917	253
Maritime Provinces and Newfoundland 37, 80,	
121, 163, 205, 249, 302, 344, 387, 428, 469, 510	
Masters with coasting certificates, navigation	
by	119
Montreal Harbor Commissioners' Ry., propos-	
ed electrification	122
Montreal harbor traffic	39
Montreal Transportation Co.'s new steamship	161
Reported sale	253

A	
Abbott, G.	234
Abbot, J.	105
Adam, W.	191
Ades, A. C.	23
Agate, E. T.	283
Akin, H. B.	379
Albertsen, A. G.	58, 63
Allanach, S.	64, 412, 455
Allen, C. L.	234
Allison, W. E.	100, 104
Amiot, R. G.	328
Amy, H. A.	62
Anderson, A.	105
Anderson, James	22
Annable, W. G.	22
Ansley, W. M.	111
Arms, W. H.	190
Armstrong, W. M.	22
Arnold, W. E.	193
Arthur, H. R.	493
Ashman, W.	144
Astle, A.	64
Audrain, J. A.	63
Auld, A. A.	204
Ayre, L. E.	141

B	
Bain, A. U.	22
Baker, J. H.	23
Baldwin, R. A.	190
Balkwill, James	412, 448
Bamford, W. B.	229, 234
Barber, E. B.	104
Barber, H. G.	23
Barber, W. J.	144, 190
Barclay, J.	62
Bard, M. W.	321, 328
Barker, A. C.	455, 486
Barnet, W. R. B.	61
Barnwell, R.	370
Barry, W. F.	370
Batchelor, C. H.	198
Bate, T.	411
Batten, B.	204
Beatt, P. S.	104
Beatty, E. W. *57, 59, 62, 455	

Beatty, Dr. H. A.	455
Beeston, G.	370
Beetham, E.	104
Beidelman, P. B.	191
Bell, R. H.	144
Benaglia, A.	190
Benjamin, C. E.	22
Berger, L.	370
Berger, N.	190, 388
Berger, R. E.	23
Berry, J. E.	370, 455, 493
Bertram, Sir Alex.	56
Bevers, H. M.	190, 234
Birch, F. E.	370
Birze, John	455, 493
Black, H. J.	455
Black, J.	22
Black, R. A.	64
Blair, J. B.	104
Blaisdell, A. J.	62, 251
Blake, W. C.	*96
Boardman, C.	23
Bond, G. A.	144
Bonter, C. C.	201, 208
Borden, H. P.	143
Bosworth, G. M.	22
Boucher, W. R.	411
Boughton, V. T.	328
Bourgeois, C. J.	67
Bovard, C. D.	412
Bowden, H. W.	328
Bowen, E.	62, 231
Boyd, H. P.	328
Boyd, H. H.	190
Boyes, J. M.	23, 63
Boyle, J. H.	101, 104, 455, 188, 189
Brent, J. R.	111
Brewer, J.	64
Briggs, G. C.	104, 143, *186, 190
Brooker, A. G.	190
Brown, A.	63, 161, 181
Brown, A. C.	111
Brown, B.	111
Brown, C. B.	111
Brown, H. H.	191

Brown, S. T.	21
Brown, W. B.	328, 370
Bryson, G. L.	235, 328
Burke, W. E.	120
Burns, T. J.	62, 455
Burpee, F. D. *116, 198, 199	
Burpee, G. B.	144
Bury, J.	144
Butterworth, G. H.	104
Buttler, P. M.	111
Byrom, J. S.	370, *400, 407, 411
C	
Callahan, J. J.	198
Cameron, H. D.	190, 229
Campbell, D. R.	22
Campbell, John	144
Campbell, J. R.	456
Campbell, J. W.	144
Canfield, G. C.	22
Cant, L. H.	141
Cardell, M. A.	22, 234
Carmichael, H. S.	*120
Carpenter, R. G.	144
Carruthers, J. C.	405
Carruthers, J. S.	190
Cartmel, W. J.	370
Casey, W. C.	62
Cassidy, T. J.	144
Cassidy, J. R.	23, 105
Caye, G. W.	58, 63
Chapman, R. F.	190
Chapman, W. P.	190
Chappell, B. T.	59, *62
Chesser, J. M.	141
Chisholm, W. W.	157
Chown, T. C.	22, 411
Christie, W.	104
Clark, A. W.	104
Clark, G.	104
Clark, G. H.	104
Clark, H. A.	105
Clark, R. F.	105
Clarke, G. S.	493
Clarke, H. S.	64

Cline, W. E.	455
Clissold, G.	104
Coates, L. J.	191
Colclough, R.	493
Coleman, E. P.	379
Coleman, G. T.	62, 143
Coleman, Jas.	284
Collins, G.	370
Collins, T. 229, 234, 328, 411	
Comeau, F. G. J.	234
Condon, F. O.	234
Condon, W. R.	64
Conway, W. R.	328
Cook, K. A.	371
Cook, W.	188
Cooper, F. W.	59, 62, 188
Corey, F. L.	494
Cottigan, H.	191
Cottrell, C. A. 187, 190, *228	
Cottrell, E. D.	23
Coughlin, J.	190
Coulter, W.	22
Courtney, G. L.	328
Cousins, E. L.	*24, 32
Cowan, H. W.	204
Cowan, W. A.	489, 493
Cowie, G. E.	370
Coyle, H. F.	284
Coyle, T. E.	144
Craig, J. H.	493
Craig, W. J.	370
Crawford, E.	493
Creehan, A. R.	101
Crites, D. M.	204
Croft, C. E. 144, 204, 208, 251	
Crowley, P. E.	493
Crowley, C. J.	234
Crumpton, A.	63
Cullingford, G. H.	22
Cunningham, G. R.	487
Cunningham, E. R. 231, 411	
Curle, W. J.	144, 188
Curley, R. C.	234, 411
D	
Dafoe, A. M.	104

Dales, A. E.	379
Daniel, A. I.	234
Darby, H.	141
Davidson, W. R.	494
Davies, E. C.	141
Davis, A. S.	329
Deacon, W. H.	190, 234
Decker, G. E.	23
Deed, J.	370
Delano, E. W.	488, 193
Denman, J. G.	144
Dennis, S. S.	493
DesBrisay, N. R.	411, 449
Devenish, W. R.	406, *411, 412
Deving, A.	105
Dewey, F. E.	188
Dewey, S. E.	166
Dickinson, E. C.	22
Dickson, J.	321
Dickson, R. S.	370
Doctor, C. T.	22
Doherty, W. B.	491
Dolan, J. F.	251
Dooner, J. J.	166
Doran, J. B.	195
Drayton, Sir Henry L.	419
Drew, E. H.	23, 161
Dring, H. G.	329, 331
Duff, W. A.	412, 455, 188, 189
Dugan, G. H.	101
Duguid, R.	101
Dunnean, J. N.	2, 62
Dunlop, N. S.	141, 188
Dunphy, John	411
Dupuis, M. J.	411
Durnford, A. M.	101, 234
duVal, E. W.	101, 234
Dymond, F. E.	456
E	
Eagleson, W.	62
Edmonds, A. E.	104
Edwards, A.	104
Edwards, R. B.	104

N	
Navigation aids in winter	78
New Brunswick-Prince Edward Island winter	
steamship service	68
New York State Barge Canal	77
Newton Navigation Co.,	191

O	
Oil burning tug in New York harbor	81

P	
Pacific Coast steamship companies and the	
Interstate Commerce Commission, a wel-	
come test	507
Pacific port authorities	431
Panama Canal Act, and steamboats with Cana-	
dian connections	382
Peace River Tramway & Navigation Co.—	
s.s. D. A. Thomas	345
Personal	39, 80,
120, 164, 208, 251, 305, 345, 385, 430, 171,	
Port Dover, Ont., dock and harbor improve-	
ments	346
Prince Edward Island, steamship service with	
main land	205, 248

Q	
Quebec Province notes	38,
80, 163, 206, 249, 302, 304, 388, 428, 469, 511	
Quebec Transportation & Forwarding Co.—	
Change in ownership	421

S	
St. Lawrence & Chicago Steam Navigation Co.—	
Absorption of	204, 384
Report	80
St. Lawrence River navigation	118
St. Lawrence Ship Channel improvements	118
Sault Ste. Marie canals traffic	38,
78, 250, 302, 343, 387, 431, 469, 509	
Shipbuilding—British Columbia, aid to	77
Conditions in	301
Dominion, aid to	246
Asked to start	426
Conditions	168, 254
Customs drawback	507
Minister of Marine on	509
Proposed mercantile marine	248
Shipbuilding in United States	300
Shipmasters Association of Great Lakes	79
Shipping companies and longshoremen at St.	
John	159
Shipping companies, North Atlantic, reported	
rearrangement	50
Shipping documents and censorship delays	381
Shipping Federation of Canada	120
Shipping statistics	510
Shipping under war conditions	118
Signalling requirements for British vessels	163
Status of shipping contract in war time	80
Steamships building at Port Arthur	300, 467
Steamship values, enormous increases	346

T	
Thorjerd and Blaamyra, steamships building	
at Port Arthur	300, 467
Toronto, Hamilton & Buffalo Navigation Co.—	
Appointments	194
Car ferry service	342, 472, *506
Toronto harbor improvements	78, 204
Transfer of Canadian vessels restricted	512
Trent Valley Canal	162

V	
Vancouver dry dock	506
Vancouver harbor improvement scheme	389
Vessel casualties on the Great Lakes	385
Vessel property, depreciation of	37
Vessels registered	248, 301, 346, 386, 428, 468

W	
Water diversion from Great Lakes proposed ...	301
Water pollution on Great Lakes	342
Welland Canal and Georgian Bay Canal, econ-	
omic and strategic aspects	165
Welland Canal lock accidents	253, 508
Welland Ship Canal construction	162, 253
Wreck Commissioners' investigations in 1914. 35	
Wreck Commissioners' judgments—	
Arachne, stranding	383
Batiscan-Bengore Head case criticized	78
Case reviewed	118
Borghild-Orion collision	466
British criticism of	432
Camoun, stranding	247
Constance, loss of	35
Edward Long, loss of	39
English Monarch, grounding	369
Ennisbrooke, stranding	300
Fairfield, stranding	430
Frank C. Barnes, loss of	347
Frankier, stranding	168
Fremona, stranding	432
Haulwen, stranding	386
Hochelaga-Etoile collision	465
Indutimare, stranding	506
Kalibia, stranding	510
Kenkon Maru 3, stranding	252
Matatua, fire on	210
Matatua, stranding	467
Middleham Castle, stranding	389

Flinter, W. C.	328, 455
Fletcher, R. S.	63
Fletcher, G. L.	187
Fletcher, J. A.	411, 418

F

Farr, R. J.	453, 487
Farrington, F.	63
Fish, R. H.	486, 494
Fisher, L.	23, 101
Fitzpatrick, W. R.	406, 412
Fitzpatrick, P. D.	328
Fitzsimmons, H. H.	494
Flynn, J. F.	64, 145
Flynn, P. J.	489, 494
Foss, W. H.	371
Ford, L. A.	141
Ford, A.	370
Forrester, C.	486, 499, 494
Forster, J. V.	22
Foster, A. deWitt	455
Fournier, A.	22
Fowler, G. F.	411
Fox, C. H.	493
Fox, G. J.	234, 488, 493
Foy, J. V.	204
Fraine, J. D.	328
Fraser, J. D.	340
Fraser, J. M.	63
Fullington, M. A.	284

G

Gadsby, R. C.	190
Galloway, A. K.	448
Galloway, C. L.	455
Gayfer, A. J.	13
George, W. K.	315
Germain, W. E.	144, 186
Gibson, G. C.	190
Gill, R. A.	328
Glass, C. D.	493
Goad, G. N.	58, 62
Godfrey, I. L.	104
Godwin, E. H.	455
Gorham, A. B.	455
Gracey, T. J.	329
Grady, T. B.	494
Graham, F. J.	204
Grant, J.	104, 234
Grant, O. C.	22
Grant, W.	328
Grant, W. H.	14, 144
Greene, S. M.	191
Greenwood, Lt. Col. H.S.	226
Greiner, J. A.	411
Grey, A.	22
Gribbin, C.	234
Griffin, G. H.	144
Groom, G. W.	363
Grosset, W. D.	104
Guscott, R. S.	144
Guthrie, J. H.	370

H

Haanel, H. E.	14
Halkett, A.	190
Hall, R. E.	190
Hallisey, J. T.	64, 406, 412
Hamilton, T. H.	190
Handford, John	456
Hannah, A. T.	234
Hardin, A. T.	456
Harper, W. H.	329
Harris, A. C.	x1, 14
Harris, C. L.	370
Harris, R. W. D.	283, 322
Harrison, G. A.	235
Harshaw, V. A.	62
Hart, L. R.	58, 63
Hawkins, J.	328
Hawkins, J. T.	142, 145
Head, H. S.	455
Heels, P. C.	144
Heflin, W. F.	328
Henderson, J. V.	329
Herlick, H.	104
Herring, J.	22
Hess, G. H., Jr.	235
Hickey, T.	235
Hicks, H.	234
Hicks, S.	22
Hill, J. J.	279
Hillier, G.	23
Hills, A. J.	370
Hilton, Jas.	198
Hoag, G. A.	190, 370
Holmes, R. G.	486, 493
Honan, J.	145
Hone, Jules	315
Hood, C.	190, 322, 328
Hopkins, W. A.	23
Horn, J. M.	144
Houston, P.	145, 329
Howard, C. C.	64
Howard, C. K.	144, 187
Howard, W. B.	62, 100, 104
Howell, W. S.	142
Hudson, C.	22
Hulatt, H.	63
Humphrey, H. J.	22, 488, 493
Humphreys, E.	23
Hutchinson, R. S.	104
Hutchinson, W. P.	228, 235, 328

I

Inglis, M. M.	199
Ingram, W. N.	328
Innesides, A. J.	328
Irving, H. A.	155
Irwin, J.	144

J

Jacklin, W. M.	493
Jackson, G. M.	62
Jackson, G. W.	370
Jackson, H. A.	191, 208
Jackson, J. W.	190
Jarrett, J.	190
Jarvis, H.	234
Jelly, R. R.	23
Johnson, A. L.	234
Johnson, J. W.	22
Johnson, R.	328
Johnston, A. L.	411
Johnston, Gilbert	204
Jones, A. H.	23
Jones, C. N.	22
Jones, T. J.	23
Jones, W.	64
Joseph, K. deS.	14, 487, 493, 494
Joyce, S. R.	105
Judah, N. F.	23, 63

K

Kavanagh, C. J.	234, 370, 411
Kelly, W. R.	144
Kendal, A. H.	406, 411
Kennedy, Sir John	566
Kennedy, T. J.	404
Kersey, H. M.	22
Ketterson, A. R.	62
Kew, W. M.	411
King, W. J.	204
Kirby, C. C.	62, 101
Knowlton, C. T.	39
Kyle, G. A.	488

L

Labrecque, E.	411
Landolph, E. L.	284
Lang, G. W.	157
Langevin, C. A.	328
Latham, R. L.	487, 494
Lavoie, O. M.	322, 328
Lawrence, A. R.	191, 208
LeClair, H. J.	190, 455
Ledingham, A.	58, 63
Lees, T.	494
Leger, S. E.	411
Leidich, C.	191
Lemay, O.	145
Lewis, E. R.	63
Lifsey, W. V.	64
Lister, D. I.	328
Little, C. A.	23
Lock, A. E.	59, 64
Long, W. H.	22, 190
Lott, C. W.	22
Lounsbury, J. E.	455
Lowe, R. L.	104
Lozo, F. J.	144
Lukes, H. N.	22
Lydon, F. C.	328

M

McAlpine, J. H.	22
McAuley, J. D.	191, 229
McCall, H.	63
McCormack, W. J.	104
McCormick, F. E.	62
McDonald, Donald	363
McDonald, E.	57, 63
McEwan, R. J.	370
McGaan, W. H.	370
McGill, J. A.	328, 362
McGill, W. E.	493
McGowan, Jas., Jr.	104, 190
McGregor, Jas.	412
McGuinness, W. G.	370
McGuire, J. F.	22
McHattie, T.	488
McIlvaine, F. B.	105
McIntosh, R. B.	62
McIntyre, D.	22
McIsaac, J. R.	494
McKay, D.	234
McKay, G. C.	328
McKay, G. G.	455
McKean, A. T.	58, 63
McKee, J. L.	412
McKenzie, K.	370
McKeown, T. M.	63
McKillop, R.	62, 142
McKinnon, J. H.	144
McLardy, J. A.	144
McLaren, J. B.	63
McLaughlin, J.	494
McLean, N.	234
McLennan, Ross	494
McLeod, E. E.	455
McMaster, A. E.	499, 455
McMath, C. N.	191
McMillan, J. D.	186, 190
McNab, W.	63
McNamara, J. D.	64
McNaughton, R. F.	411, 448
McNicholl, G. A.	58, 59

McNicholl, David	489
McPhail, H.	144
McPherson, P.	455
McPherson, R. A.	190
McRae, J.	493
McRea, J.	22
McWood, W.	487
Macallum, A. F.	322
MacArthur, J. A.	190
MacArthur, J. M.	23, 63, 229
MacCallum, H. M.	62
MacDonald, D. G.	23
Macdonald, P. A.	74, 116
MacGowan, A. R.	62
MacKenzie, H. A.	62
MacKenzie, K.	104
MacLeod, T. R.	104
Macrae, John	144, 190
Madill, Jos.	363, 370
Maguire, A.	494
Main, D.	22
Main, D. T.	411
Mallinson, A.	22
Manahan, P. K.	104
Manders, W. G.	144, 187
Mansfield, A. H.	22
Margetts, H. L.	412
Martin, G. R.	449
Martin, J. A.	22
Martin, R. H.	371
Massey, A.	494
Masters, A. K.	105
Maxwell, W. C.	23
Maynard, A. S.	144
Mays, A.	22
Melrose, E. J.	62
Melville, J. R.	190
Metivier, J. A.	362, 370
Midgley, F. H.	143
Miles, H. R.	370
Miles, J.	370
Miller, A. L.	412
Miller, R. A.	22
Miller, W. F.	22
Milliken, R. M.	22
Millman, W.	234
Mills, E. R.	104
Mills, W.	64
Minnis, J. L.	23
Moffatt, J. F.	144
Moffatt, W. J.	235
Montgomery, G. A.	406, 407, 411
Mooney, Neil	405, 412
Moore, C. R.	228, 229, 235
Moore, E.	455
Moore, G. J. P.	328
Moore, W. C.	22
Morazain, J. E.	229, 235, 285, 488, 493
Morgan, J. H.	493
Morice, D.	406
Morton, H.	412
Moriarty, J.	105
Mortimer, G.	493
Moth, G.	23
Moulton, C. H.	105
Muir, J. D.	190
Mulkern, L.	229, 234
Munroe, C. A.	105
Murphy, D. J. Jr.	235
Murphy, M. G.	59, 62, 411, 449, 455
Murphy, S. J.	204
Murray, D.	494
Murray, W. R.	145
Myers, E. W.	104, 144

Naismith, P. L.	494
Nason, F. L.	58, 63
Neal, W. H.	493
Neill, J.	104
Newby, J. C. L.	411
Newcomer, R. E.	144, 191
Nicholson, R. V.	190
Nix, E. A.	411
North, G. A.	22
Nowell, G. H.	23, 58

O'Connor, C. F.	62
O'Donnell, J. C.	487, 493
O'Keefe, D. C.	190, 235
O'Keefe, W. H.	412
Oliver, E. W.	190
Oliver, D.	204
Omer, L. E.	371
Opie, E.	145
Orman, W. H.	370
Orr, R. E.	190, 328

Paisley, Sir George	319
Paisley, D. C.	104, 186
Panser, E.	23
Panter, J. A.	63, 405
Parker, F. H.	191
Parke, S. J.	23
Parry, Harry	59, 64
Parsons, D. R. W.	104
Patrick, A.	22
Patterson, B. T.	104
Peck, J. S.	411
Pentland, A. J.	190

Perry, C. A.	190
Phelps, C. E.	190, 191
Phillips, William	486, 489, 493
Pickrell, W. J.	411, 449
Pierce, J. F.	204
Piers, A.	63
Porteous, Jas.	456
Porter, A. D.	322
Pottle, S. A.	190
Powell, G.	191
Powell, W. G.	229
Pratt, G.	190
Proctor, C. S.	328
Pretty, R. K.	191
Price, C. W.	371
Purcell, P. E.	23
Purvis, Allan	230, 234, 455, 487, 489, 493
Pyne, R. A.	406, 411

Quinn, R.	190
Rahilly, T. F.	190, 229
Raleigh, J. J.	191
Ramsey, C. W. P.	282, 284
Rankin, A. E.	204
Ray, A. S.	104
Redmond, A. V.	329, 493
Redmond, T.	22
Reece, I. G.	190
Reed, H. J.	234
Reeves, J.	64
Reid, G. S.	144
Reid, H. G.	284, 449, 455
Reid, J. A.	190
Reid, Sir William D.	55, 196
Renix, W. J.	63, 190, 234
Rennie, W. J.	58, 63
Reycroft, J. L.	186
Richardson, A. G.	101, 104
Richardson, H. T.	104
Rioux, F.	321, 322
Rioux, J. E.	105
Ripley, Blair	235
Roberts, A. J.	105
Roberts, W. C.	328
Robertson, F. W.	22, 58, 455
Robinson, W. J.	204
Rodger, T.	105
Rogers, L. G.	455
Rooke, G. T.	22
Roper, E. L.	370
Rose, B. A.	455
Roth, I.	328
Roy, A. J.	362, 370
Royce, G. C.	339
Rudd, J.	234
Rueger, J. H.	23
Ruhl, H. T.	14
Rule, N. A.	411, 471
Russell, John	104
Russell, W. A. B.	455, 487
Ruthven, W. H.	494
Rutledge, A.	455
Rutter, F. M.	101, 104
Ryan, L. E. N.	370

Sadlier, F.	190
Sadlier, F. W.	234
Sample, W. H.	449, 455
Sands, T. E.	229, 235
Sarney, C. E.	234
Saunders, H.	144
Schreiber, Sir Collingwood	55
Scoles, C. R.	285
Scott, A.	235, 283, 284
Scott, J. H.	234
Scott, J. R.	144
Scott, L. G.	145
Scott, R. W.	493
Senay, C.	234, 283, 284
Sergeant, W. J.	104
Sharp, A. S.	494
Shaughnessy, Lord	55
Shaw, A. T.	370
Shaw, J. R.	62, 328, 405
Shea, J. M.	234, 251
Shearer, H.	421
Sheehan, E. L.	104
Shepherd, W.	62
Sheridan, A. C.	234
Sheridan, M. J.	145, 329, 371
Shields, A.	59
Silcox, L. K.	187
Silliman, J. M.	143, 141
Simmons, W. E.	456
Simpson, J. E.	105
Siverton, P. J.	370
Skelley, L. J.	493
Smallwood, W. F.	64
Smith, A. H.	319
Smith, A. L.	411
Smith, G. H.	63
Smith, H. G.	235
Smith, H. H.	412
Smith, J. B.	455
Smitten, G. H.	191
Somers, G. O.	229
Speakman, J. F.	362
Spier, H. A.	63

Sproule, G. St. G.	*13, 14
Stanger, C. T.	486, 494
Stebbing, E. T.	235
Stephen, G.	143, 144, 487, 493
Stephens, D.	63
Stevens, A. E.	234
Stewart, A. F.	102, 104, 190
Stickney, A. B.	373
Stinson, C. H.	23
Stinson, W. J.	328
Stokes, C. R.	104, 493
Suckling, I. E.	62
Summerville, R.	371
Sumner, F. W.	64
Sutherland, P. D.	62, 208
Sweetman, A. H.	22

P	
Paish, Sir George	3
Paisley, D. C.	104, 1
Panser, E.	
Panther, J. A.	63, 4
Parker, F. H.	1
Parke, S. J.	
Parry, Harry	69,
Parsons, D. R. W.	1
Patrick, A.	
Patterson, B. T.	1
Peck, J. S.	4
Pentland, A. J.	

Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 215

TORONTO, CANADA, JANUARY, 1916

Subscription Rates, Page 21

Special Shell Tools

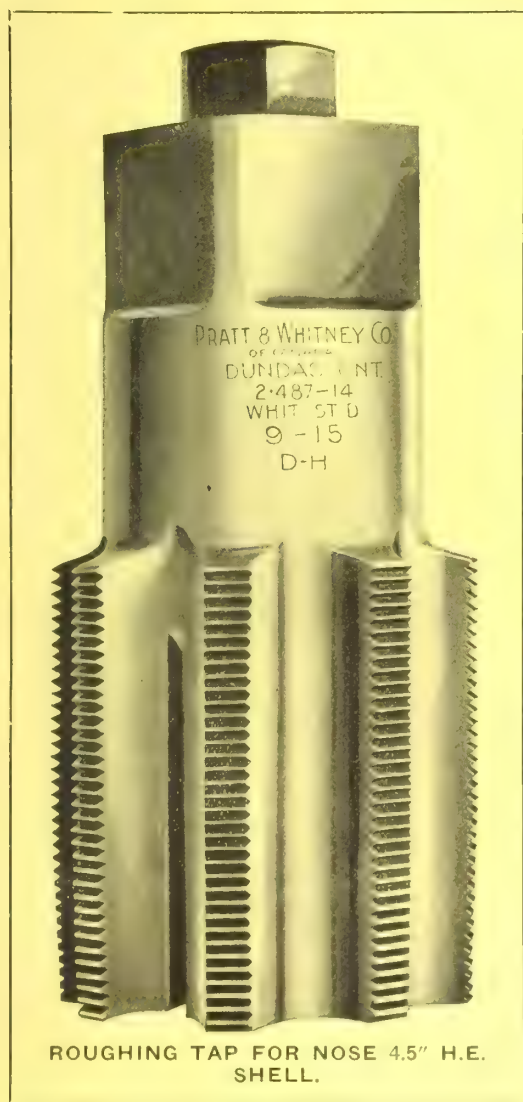
for 18 Pr. Shrapnel and H.E. Shells
also for 4.5" Howitzer Shells.

We stock at all our branches a
complete line of adjustable taps for
shells up to 4.5" H.E.

Easily adjusted to maintain ac-
curacy to size.

Guaranteed true to form in
thread and accurate in pitch.

Let us send you our lists and blue
prints of these tools.



Pratt & Whitney Co. of Canada, Limited
DUNDAS, ONTARIO, CANADA

MONTREAL
723 Drummond Bldg.

VANCOUVER
609 Bank of Ottawa Bldg.

WINNIPEG
1205 McArthur Bldg.

Westinghouse

Cross-Compound Steam-Driven Air Compressors



10-inch Westinghouse Cross-Compound Compressor as used in building construction.

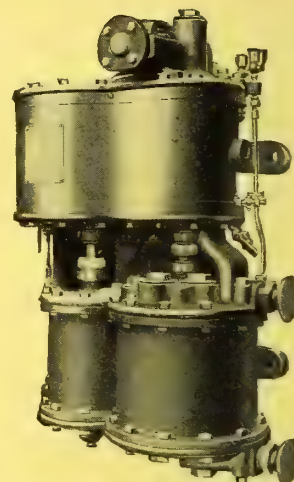
Particularly efficient for railroad construction work.

Mechanically strong and self-contained.

Operation simple—no expert attendance required.

Easy to move about, and can be set up almost anywhere; against a wall, on a column or post, or even the trunk of a tree. Many are in use attached to the boiler of a hoisting engine, also installed on steam shovels.

Our nearest office will tell you all about them; write,



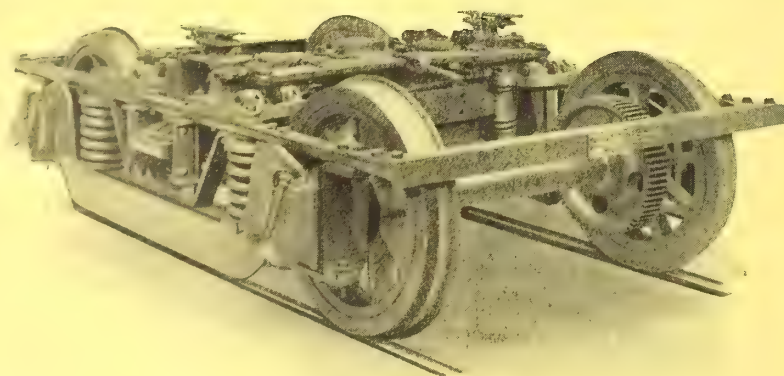
Westinghouse Cross Compound Compressor.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

TORONTO MONTREAL OTTAWA HALIFAX FT. WILLIAM WINNIPEG CALGARY EDMONTON VANCOUVER
Traders Bank Bldg. 52 Victoria Square Ahearn & Soper, Ltd. 105 Hollis St. Telfer Bldg. 158 Portage Ave. E. Grain Exchange Bldg. Dominion Bldg. Bank of Ottawa Bldg.

Canadian Baldwin Electric Trucks

INTERURBAN SERVICE



Canadian Baldwin Trucks, Class 84-30-AA, built for Lake Erie and Northern Ry., Ontario.

The truck illustrated is designed for high speed on electric railways, and has a rated carrying capacity of 30,000 pounds on the centre plate.

It has frictional side bearings and is of the equalized pedestal type.

Canadian Baldwin trucks, solve the problem of minimum weight, economical maintenance, simple construction, noiseless operation and easy riding.

There is comfort in riding on roads where Canadian Baldwin Trucks are used.

Manufactured in Canada by

Canadian Locomotive Company, Limited
KINGSTON, ONTARIO

January, 1916.]

CANADIAN RAILWAY AND MARINE WORLD.



Sanitary
Dustproof
Weatherproof
Durable
Uncrackable
Unshrinkable
Unflakable

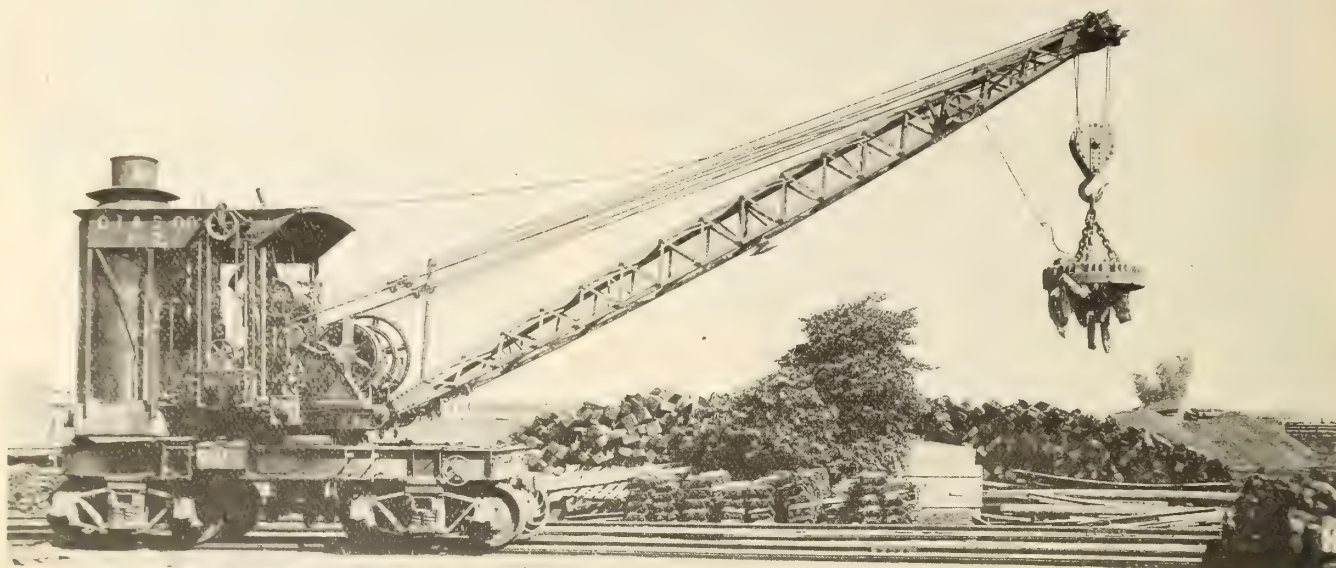


For Car Seating and Curtains

More than a satisfactory substitute for leather.
Non-splitting, non-peeling, tough, weatherproof.
Test its durability. Free samples on request.



DU PONT FABRIKOID COMPANY
Du Pont Building, Wilmington, Del.
Canadian Office and Factory, TORONTO, CANADA
WENDELL & MacDUFFIE COMPANY
R.R. Department Representatives, 63 Broadway, N.Y.



Why employ 20 to 40 men to handle your material? A

BROWNHOIST Locomotive Crane

will do the same amount of work with a decided saving to you. Its cost, including 6% interest on investment, depreciation, and operating costs, is only \$6.00 to \$10.00 per day. It is one man operated, powerful, quick-acting, and built to withstand hard and continuous service. Records prove this.

ADAPTABILITY. The equipment is interchangeable. It only takes a short time to apply the Grab Bucket, Bottom Block, Drag-Line Bucket, Pile Driving Attachment, Lifting Magnet, or Shovel Equipment. This makes practically six machines in one.

RAILROADS all over the country are realizing more and more the advantage and economy of having a Brownhoist Locomotive Crane on the job, because it is always ready to work in case of emergency. A Brownhoist Crane can be relied upon. One road uses thirty of them.

INVESTIGATE TO-DAY. Catalogue I shows
how and where some of these cranes are used.

THE BROWN HOISTING MACHINERY CO.
CLEVELAND, OHIO

MONTREAL OFFICE, 145 St. James Street

Galena-Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil

in Headlights, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and Correspondence Solicited.

S. A. MEGEATH,
PRESIDENT.

SHELL BOX HANDLES

Approved by the Shell Committee.

If you have any
WIRE ROPE

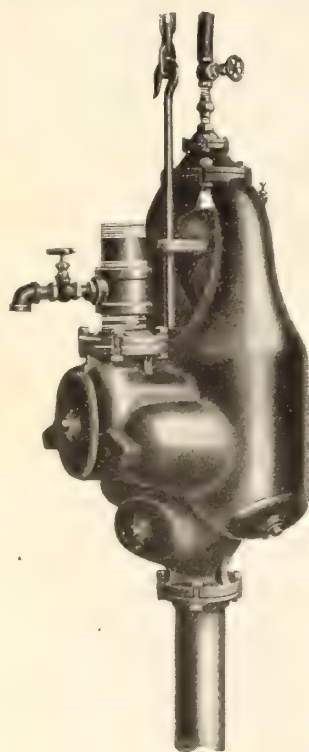
troubles let us help
you.



All sizes and qualities
of
WIRE ROPE

carried in our
Montreal, Winnipeg and
St. Catharines' Stock.

The DOMINION WIRE ROPE CO., Limited, MONTREAL



“Pulsometer” Pumps

“Hayward” Buckets

“Napanee” Hoisting Engines

“Ransome” Concrete Mixers

“Andrews” Drill and Tool Steel

“MARION”

Railroad Ditchers
Steam Shovels
Drag Line Excavators
Dredges, etc.



BRANCH:
St. Catharines, Ont.

F. H. Hopkins & Co

HEAD OFFICE
MONTREAL

The Steel Company of Canada, Limited

HAMILTON, CANADA

Special Steel Marine Forgings

When forgings are required to stand the strain of rough weather, and to prove themselves reliable and dependable, write us for particulars and prices.

We have the facilities for the production of heavy steel forgings of all kinds, including:

Connecting Rods

Crank Shafts

Eccentric or
Cam Forgings

Marine Engine
Forgings

Piston Heads

Piston Rods

Shafting



Stern Frame of Steamship Hamonic

Rounds

Squares

Rudder Frames

Stern Frames

Side Rods

Steam Engine
Forgings

District Sales Offices:

HAMILTON

MONTREAL

TORONTO

WINNIPEG

W. A. MacLennan, Vancouver, B.C.
J. B. H. Rickaby, Victoria, B.C.

H. G. Rogers, St. John, N.B.
Geo. D. Hatfield, Halifax, N.S.

Nova Scotia Steel and Coal Co., Limited

Manufacturers of

MARINE, RAILWAY AND GENERAL ENGINEERING FORGINGS OF ALL SHAPES AND UP TO 40 TONS IN WEIGHT, MADE FROM BEST ORDINARY OR HARMET FLUID COMPRESSED OPEN-HEARTH STEEL. OUR FORGE IS EQUIPPED WITH THE MOST MODERN STEAM HYDRAULIC PRESSES. RAILWAY TRACK MATERIAL, fish plate, tie plate, track bolts, spikes, tee rails—12 to 40 lbs. per yard.

ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

ALSO MINERS AND SHIPPERS OF THE CELEBRATED "OLD SYDNEY" COAL. HIGH CALIFORIC VALUE—LOW ASH—UNEXCELLED FOR STEAM-RAISING PURPOSES. BEST HOUSE COAL MINED IN CANADA.

Collieries, Iron and Steel
Furnaces:
SYDNEY MINES, C. B.

Coal Shipping
Piers:
NORTH SYDNEY, C. B.

Finishing Mills, Forge, and
Engineering Shops:
NEW GLASGOW, N.S.

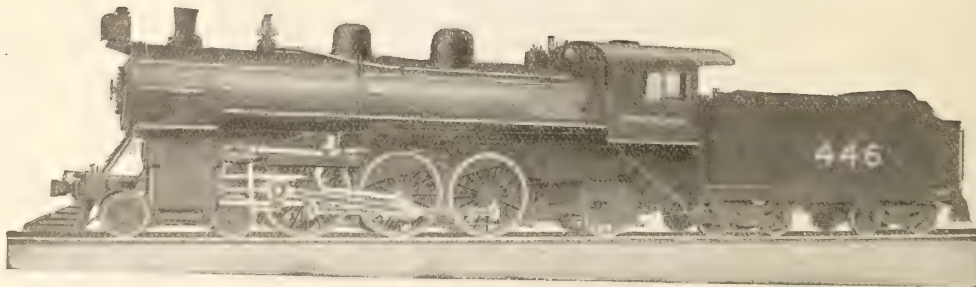
ENQUIRIES SOLICITED

Western Steel Sales Office
Room 14, Windsor Hotel,
Montreal, Que.

Western Coal Sales Office:
219, Board of Trade Bldg.,
Montreal, Que.

Head Office :
NEW GLASGOW, N.S.

Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE — INTERCOLONIAL RAILWAY.

Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

MONTREAL LOCOMOTIVE WORKS, LIMITED,
DOMINION EXPRESS BUILDING, MONTREAL, CANADA

January, 1916.]



O-B Trolley Retriever

Simplified design and rugged construction account for the very satisfactory performance of this retriever in service.

It acts quickly when the trolley jumps and is easily reset by the conductor. Requires little, if any, attention at other times.

Repair bills are small where O-B Retrievers are used.

LET US SEND A RETRIEVER FOR FREE TRIAL ON YOUR ROAD

The Ohio Brass Co., Mansfield, Ohio, U.S.A.

HART CONVERTIBLE CARS ARE MONEY SAVERS IN BALLAST WORK



In Construction Work with Side Plow and Lidgerwood Car



In Ballast Work Centre Dump with Rodger Double Plow Distributing Car

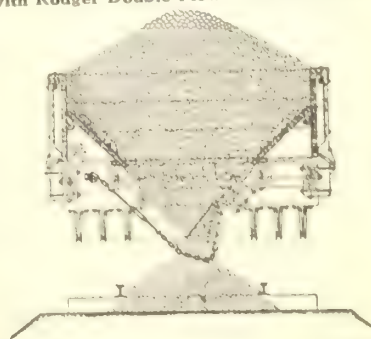
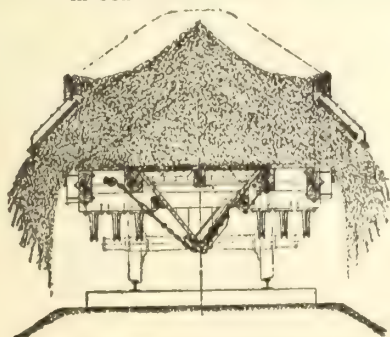
Three Cars in One

BALLAST CAR
CONSTRUCTION CAR
GONDOLA CAR

Use centre dump for ballast and maintenance work and save \$200.00 per mile over any other method.

Use side dump for heavy construction work.

THE HART-OTIS CAR CO. LIMITED
MONTREAL



Coast to Coast Service

BETWEEN

TORONTO AND VANCOUVER

BY

Canadian Northern Railway

THE NEW ROUTE to Port Arthur, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Prince Albert, North Battleford, Calgary, Edmonton, Kamloops, New Westminster, Vancouver and All Western Points.

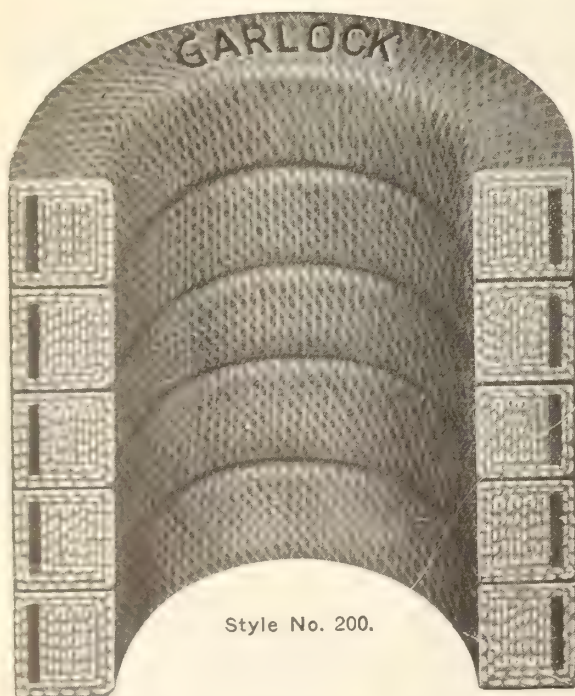
Leave TORONTO 10.45 P.M.
Mon., Wed., Fri.



Connections to and from
all points.

ELECTRIC LIGHTED SLEEPERS, DINING CARS AND FIRST-CLASS COACHES.

For full particulars, through tickets to all points and Berth reservations, apply or write to R. L. FAIRBAIRN, General Passenger Agent, 68 King St. E., Toronto, Ont.



Style No. 200.

Garlock High Pressure Piston Rod Packing

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.

THE GARLOCK PACKING COMPANY

Hamilton, Ontario

Branches:

Montreal, Quebec
Toronto, Ontario
Winnipeg, Manitoba

342 St. James St. East
Continental Life Bldg.
Galt Building





Where "Time Is The Essence Of The Contract"

you can't afford to let your men use inefficient tools.

Yet the probability is that they are wasting time trying to get the last bit of wear from their files.

And at a certain point in the life-time of a file, the time lost in its use is money wasted.

By using a half-worn file your men may be slowing up a contract that means thousands of dollars to you.

They'll do better work with a new file—in less than half the time. And the saving goes into your pocket.

But, be sure the files used are of the following brands:

**KEARNEY & FOOT
AMERICAN**

ARCADE

(Made in Canada)

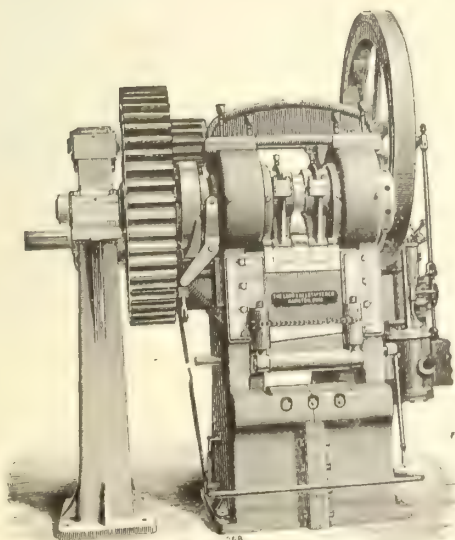
**GREAT WESTERN
GLOBE**

The Files with our 50 years' experience at back of them. They last!
Write for our FREE copy of "File Philosophy."

NICHOLSON FILE COMPANY,
(Dealers Everywhere)

PORT HOPE

POWER PUNCHING AND SHEARING MACHINERY



Gate Shear—Steam-Driven

Over 350 sizes and styles for all kinds of light and heavy work designed and manufactured by

THE LONG & ALLSTATTER CO.

Hamilton, Ohio, U. S. A.

Riveting Machines

Tire Welding Machines

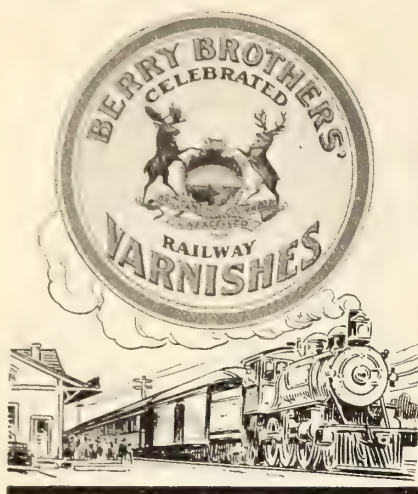
Armature Disc Notching Machines

Tire Bending Rolls

Beam Coping Machines

Bending and Forming Machines

Write for Catalogue if interested. Correspondence invited.



Appearance is an Outward Sign of Prosperity

A farm, with rich soil, may have nothing but unpainted, rambling looking buildings. It brings a small price. A farm with poorer soil may have new buildings and everything looking UP-TO-DATE and bring a higher price. Looks please or displease—create prejudice for or against.

BERRY BROTHERS' RAILWAY and MARINE VARNISHES supply a means of continuing good appearance.

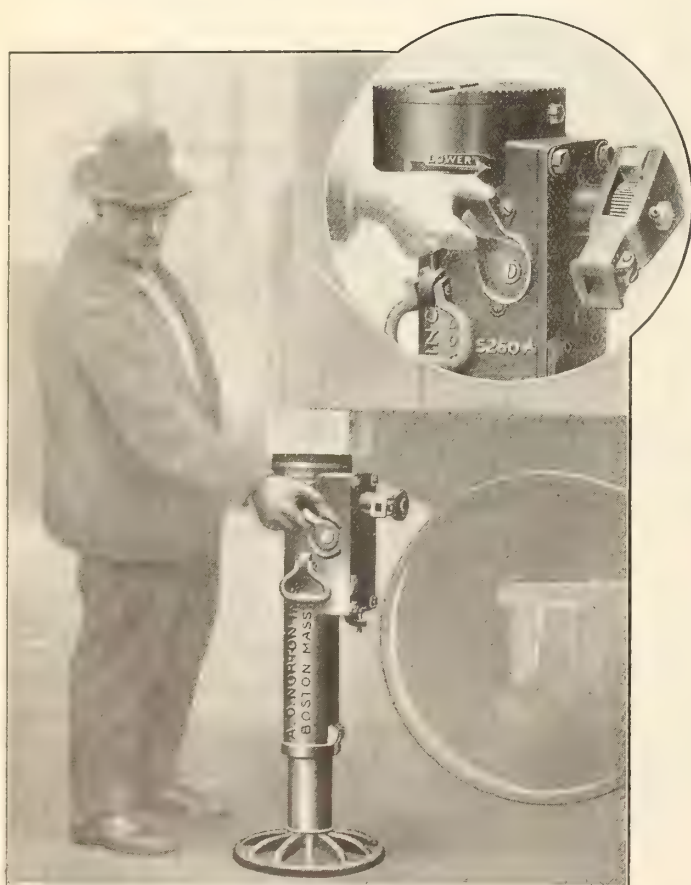
BERRY BROTHERS' VARNISHES have given over half a century's satisfaction to users. Their rich tone and wonderful wear resisting qualities have demonstrated their superiority wherever used.

Let us send you some interesting literature on varnish problems

BERRY BROTHERS
(INCORPORATED)
World's Largest Varnish Makers

WALKERVILLE

ONTARIO



Don't Pump Your Jack Down

Lower the Load by "Pressing the Button"

THE NORTON SELF LOWERING JACK

is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

Send for Illustrated Catalogue No. 28

A. O. NORTON, Limited
Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents: **MUSSENS LIMITED**
Montreal Toronto Winnipeg Cobalt Calgary Vancouver



GRAND TRUNK HOTELS

The Chateau Laurier, Ottawa, Ont.

Accommodation 350 Rooms. Rates
\$2.00 per day and upwards. Euro-
pean Plan.

The Fort Garry, Winnipeg, Man.

Accommodation 300 Rooms. Rates
\$2.00 per day and upwards. Euro-
pean Plan.

The Macdonald, Edmonton, Alta.

Accommodation 250 Rooms. Rates
\$2.00 per day and upwards. Euro-
pean Plan.

Hotels under construction—

The Qu' Appelle, Regina.

The Prince Rupert, Prince Rupert.

G. T. BELL,
Passenger Traffic Manager,
Montreal.

The Double Track Route

Provides

SERVICE	COMFORT
SAFETY	COURTESY
SPEED	CONVENIENCE

WINTER TOURS to California and all Pacific Coast Points. Florida, Texas, New Orleans, Etc.

Winter Tours Tickets now on sale. Stop over privilege allowed.

The New Way West

Via the Transcontinental and Grand Trunk Pacific Railway affords new scenery, new interests. Write to any Agent of the Company for a verifying matter, rates, and all particulars.

W. S. COOKSON,
General Passenger Agent,
Montreal.



Pintsch Mantle Light

No other system of car lighting gives clean, safe and efficient light without intricate mechanism, subject to defects and failures. Pintsch Mantle Light is the only absolutely dependable method of lighting railway cars.

The Safety Car Heating and Lighting Company

2 RECTOR STREET, NEW YORK

718 TRANSPORTATION BUILDING, MONTREAL

465 Railroad Shops in the United States and Canada Use the Thermit Welding Process



Let us send you this pamphlet.

This comprises practically all the shops of importance in North America, and it can be said without exaggeration that the list of railroads using Thermit includes practically every system from the small road having only three or four locomotives to the largest system in the world having many thousand locomotives.

If by any chance your shop is not using Thermit, you should investigate the process and see how effectively and economically it will handle the many repairs on locomotive frames and other sections.

Remember that the greatest railway systems in the world use hundreds of thousands of pounds of Thermit. They do not use it for any reason except that it "delivers the goods" and has proven itself a profitable investment.

Let us mail you our new pamphlet, No. 2144, which contains full information on the use of Thermit in Railroad Shops.

We have a well equipped shop in Toronto, Ont., for the manufacture of Thermit and appliances used with it.

Goldschmidt Thermit Company

103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco

7300 So. Chicago Ave., Chicago

90 West Street, New York



The No. 25 McLain Pressed Steel Headlight

is equipped with triple nickel-plated polished reflector of special parabolic design which centralizes the rays of a concentrated filament Mazda bulb perfectly focused, throwing a straight, strong beam of light down the track, far ahead of the car.

Extremely light—weighing three pounds less than any other Headlight.

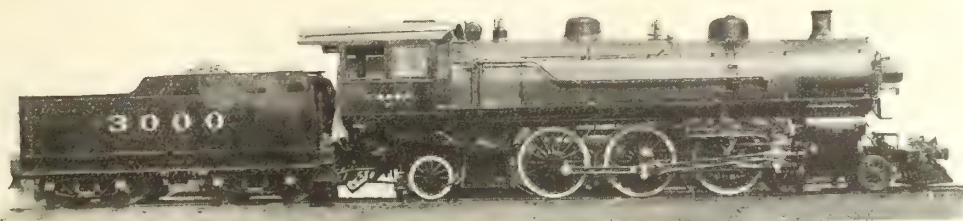
No sacrifice has been made to attain this lightness of weight for the McLAIN No. 25 is as strong as any Headlight made, and has an illuminating power in excess of other Headlights employing an incandescent globe.

Has extended dash—Dust and waterproof.

Guaranteed to give good service.

Write for booklet and prices.

The Trolley Supply Co.
Canton, Ohio



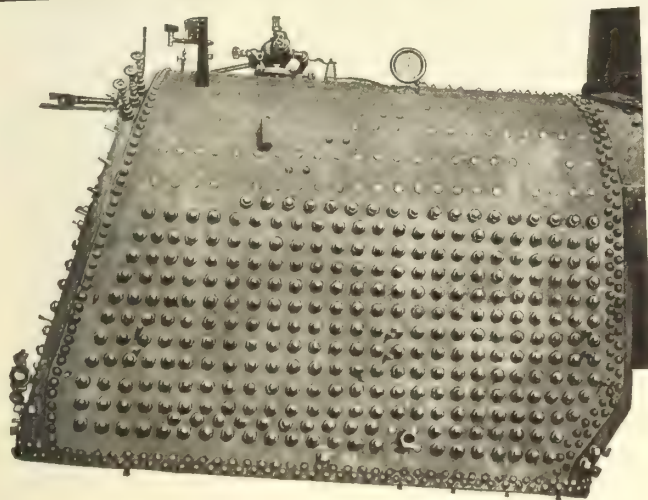
Scientific Treatment of Boiler Waters Dearborn Service to Railroads

Every time an engine failure takes place it means a large expense in dollars to the railroad company in time lost, impairment of service, and cost to send another engine to the rescue. Every time a locomotive goes to shop for repairs, it represents many thousands of dollars invested capital which is earning no revenue.

By the use of Dearborn Treatment engine failures due to the boiler foaming or leaking can be entirely eliminated. Dearborn Treatment counteracts the foaming tendency in waters of that type, and prevents scale formation, and the corrosive and pitting action that results in leaks. By thus overcoming the bad effects of the waters used, and

keeping the boiler tubes and sheets free from incrustation, the engine may be kept in service longer between boiler washings, and the period between shoppings for repairs of this character will be much longer. There are also great savings in fuel and lubricating oil, and the engine will always be in condition to haul full tonnage.

DEARBORN CHEMICAL COMPANY OF CANADA, Limited
Office and Works: 1220-1230 Dundas Street, Toronto, Canada



The Perfect Stay

For Locomotive Fire Boxes

Tate Flexible Staybolts

Are now in use on 425 Railroads of the United States as well as the main Railroad Systems of Canada.

RECOGNIZED AS THE MOST ECONOMIC FLEXIBLE STAYBOLT now in the market, because the Tate Bolt has demonstrated its true functions as a mechanical appliance to service fire box requirements.

MANY RAILROAD SYSTEMS have kept accurate service records and show remarkable increase in the earning power of the locomotives that have been equipped with complete installations of the Tate Flexible Staybolt.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.
Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.

MODERN HIGH-CLASS ROLLING STOCK



Passenger, Freight
and
Electric Railway,
Car Castings,
Forgings and Repair
Parts.

CROSSEN CAR COMPANY, LTD.
COBOURG ONTARIO

PEDLAR'S "PERFECT" PRODUCTS MADE IN CANADA


The First Cost is the Only Cost



WHEN you are figuring on a culvert installation, it is well to consider the importance of permanent construction. It is poor economy to saddle the corporation with a heavy burden of maintenance cost.

PEDLAR'S 'Perfect' Rivetted CULVERT

is the most satisfactory and least costly form of Culvert Construction. Easy to install, and once installed the job is PERMANENT. No maintenance required.

Made of heavy gauge, anti-corrosive, galvanized  possessing wonderful strength, ductibility and malleability.

Shipped assembled in lengths up to 40 feet—coupling bands supplied free for greater lengths. Diameters 8 ins. to 54 ins.—special sizes made to order.

Write for Culvert Reference Book No. 4 "R.M." containing drainage tables and important data.

Address Nearest Branch.

THE PEDLAR PEOPLE, LIMITED
(Established 1861.)

Executive Office and Factories: OSHAWA, Ont.

Branches: Montreal Ottawa Toronto London Winnipeg.

10-5



**CANADIAN
STEEL FOUNDRIES
LIMITED**

STEEL CASTINGS - MANGANESE STEEL CASTINGS
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK
BAR STEEL

GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
BRANCH OFFICE — TORONTO

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL

Canadian Pacific

When You Travel—Travel In Comfort

"The Canadian Pacific Railway offer to the travelling public service and equipment second to none. They build, own and operate their Compartment Observation Cars, Standard Sleepers, Dining Cars, Coaches and Motive Power."

"The Canadian Pacific own and operate a line of palatial hotels along the Railway from Atlantic to Pacific, thus affording their patrons every possible comfort."

Those contemplating a trip will receive full details and literature on application to any C. P. R. agent, or write

W. FULTON,
Asst. Dist. Pass'r. Agent, Toronto.

M. G. MURPHY,
Dist. Pass'r. Agent, Toronto.

Thor

Reversible, Pneumatic, Wood-Boring Machines

Size AW boring holes $3\frac{1}{4}$ " in diameter for car floor washers. Maximum capacity 4". Equipped with Corliss valves, roller bearings and one piece connecting rods. Economical and reliable. Especially adapted for marine work. Free trial.

Ask for Circular W Showing Complete Line

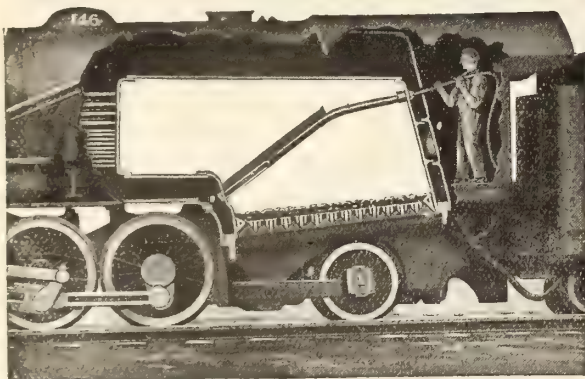
Independent Pneumatic Tool Company

334 St. James St., Montreal, Que.

W. H. Rosevear & Son, Winnipeg, Man.



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes.

LAGONDA ARCH TUBE CLEANERS

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

Other Lagonda Boiler Room Specialties are described in our General Catalogue L-8. Send for Copy.

Babcock and Wilcox, Limited

Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Building

The Parmelee Pipe Wrench "The Toothless Wonder"



PRICE LIST C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	$\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{8}$, 1 in.	\$5.00	\$2.25	$\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{8}$, 1 in. \$.75
20 in.	2 $\frac{1}{2}$	$\frac{3}{4}$, 1, 1 $\frac{1}{4}$, 1 $\frac{1}{2}$, 2 in.	7.50	2.50	$\frac{3}{4}$, 1, 1 $\frac{1}{4}$ in. 1.00
25 in.	3 $\frac{1}{2}$	1 $\frac{1}{4}$, 2, 2 $\frac{1}{2}$, 3 in.	7.50	3.00	1 $\frac{1}{4}$, 2, 2 $\frac{1}{2}$, 3 in. 1.25

Prices on larger sizes furnished upon application.

DESIGNED ESPECIALLY to handle pipes spaced closely as in coil work. No. 2 $\frac{1}{2}$ wrench illustrated requires but three-quarter inch space between pipes.

POSITIVE GRIP instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

RATCHET-LIKE ACTION. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

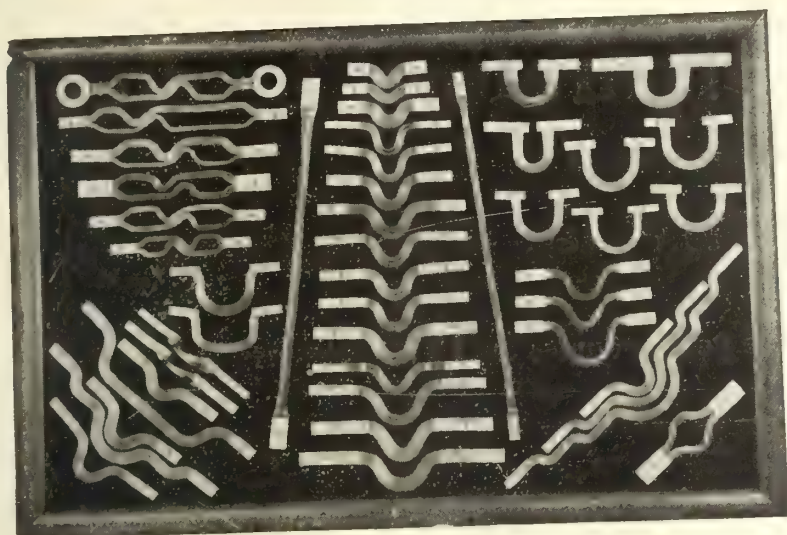
CAN'T CHEW. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

CAN'T CRUSH. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.

Rice Lewis & Sons, Ltd.

TORONTO, CANADA.

January, 1916.]



Electric Weld Rail Bonds

meet every condition.

Neither do they corrode at the terminals.

**The Electric Railway
Improvement Co.**
Cleveland, Ohio

DOMINION IRON & STEEL CO., Limited

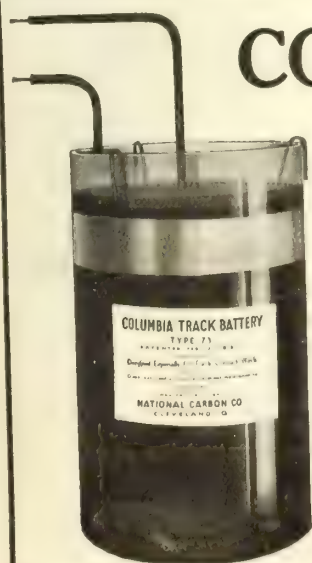
MANUFACTURERS OF

BASIC OPEN HEARTH STEEL RAILS

We will be pleased to have your enquiries for 1916 shipments

HEAD OFFICES
AND WORKS

SYDNEY, CAPE BRETON, CANADA



COLUMBIA TRACK BATTERIES

are used by railroads in all parts of this continent. They are favored because

1. They are reliable in operation. They furnish a constant current regardless of weather or service conditions.
2. They are simple in construction. They are easy to set up, and easy to maintain.
3. They reduce the cost of battery operation. They are low in initial cost and low in cost of renewals.
4. They can be used with or without external resistance. They will operate satisfactorily either way.

Write us for detailed information.

CANADIAN NATIONAL CARBON COMPANY, Limited
99 Paton Road
TORONTO, ONTARIO

Algoma Steel Corporation, Limited

Manufacturers of

Steel Rails, Splice Bars, Tie Plates, Forging Billets, etc.

We would be pleased to have your enquiries for 1916 deliveries.

Works and Sales Department: Sault Ste. Marie, Ontario, Canada

DROP FORGINGS

Made in the Champion Way

Also Steam Hammer and Heading Machine Forgings

Let us have your Blue Prints

THE CHAMPION MACHINE & FORGING COMPANY
CLEVELAND, OHIO

New York Office:
30 Church St.

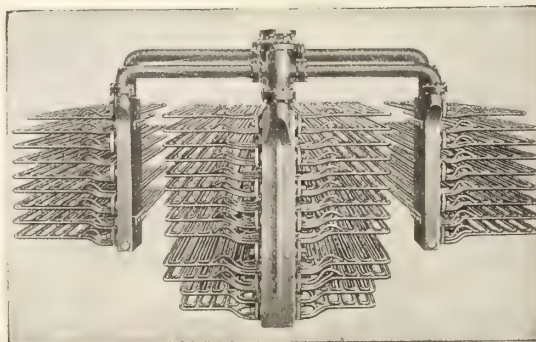
Philadelphia Office:
Bourse Building.

Detroit Office:
H. B. Kendal,
56 Cadillac Sq.

Chicago Office:
1623 Monadnock Block.

Fire Tube Marine Superheater--Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler horse power from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 CHURCH ST., NEW YORK, N.Y.

PEOPLES GAS BLDG., CHICAGO, ILL.

JAS. W. PYKE & COMPANY, LIMITED

IRON, STEEL AND METAL MERCHANTS

LOCOMOTIVE, DRIVING, ENGINE AND TENDER TRUCK AXLES, PASSENGER, FREIGHT, AND ELECTRIC TRAM CAR AXLES—To Standard or Railway's own Specification.
 STAYBOLT AND ENGINE BOLT IRON—Quality and Service Unexcelled.
 STEEL PLATES—Firebox, Flange and Tank Qualities.
 STRUCTURAL SHAPES—Beams, Channels, Angles, Tees, Zees, etc.
 STEEL BILLETS & FORGINGS—of all descriptions.
 LOCOMOTIVE BOILER AND SUPER HEATER TUBES—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
 232 ST. JAMES STREET,

MONTREAL

The Light of Day on the Right of Way

HEADLIGHTS

Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

CAR LIGHTING

Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency and economy. Standard cylinder supplies from one to two months' lighting of the average car.

SIGNALS

Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

Commercial Acetylene Railway Light and Signal Company

103 BAY STREET, TORONTO

Main Office 80 Broadway, New York

Branches: Atlanta, Boston, Chicago, San Francisco



Triple Elliptic Tender Spring, Cast Ends

RAILWAY SPRINGS

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.
 EQUALIZING, DRAWBOARD, BUFFER AND SPIRAL SPRINGS of all kinds.

STREET RAILWAY SPRINGS, from the largest to the smallest.
 TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE SANDERS, CHAIN, Etc.

MANUFACTURED BY

B. J. COGHLIN COMPANY, LIMITED

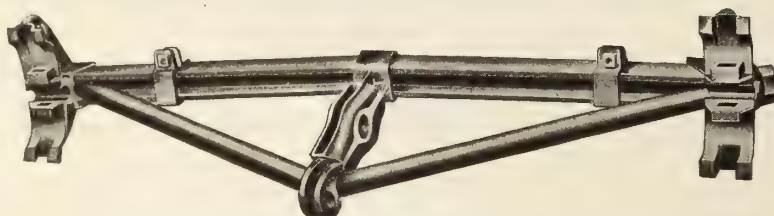
MONTREAL - - CANADA

Buffalo Brake Beam Company

BUFFALO BEAMS ARE BEST BEAMS

OFFICES :

NEW YORK
30 Pine Street
ST. LOUIS
Syndicate Trust Bldg.
MONTREAL
195 Commissioner St.



WORKS :

Buffalo, New York

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment



MADE IN CANADA

Pratt & Whitney Co. of Canada, Limited

DUNDAS, ONTARIO

VANCOUVER

MONTREAL

WINNIPEG

DIES!

FOR ALL KINDS OF SCREW CUTTING

REAMERS - DRILLS
CUTTERS - TAPS

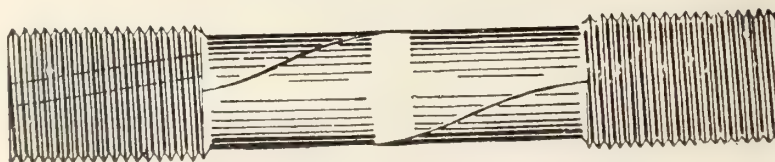
"The Guaranteed Line"

SOLD on MERIT

Get Our No. 8 Catalogue

American Flexible Staybolts

Manufactured in Montreal



Made of the best standard staybolt iron, adding flexibility by process of making as shown above--closely approximating a rope structure.

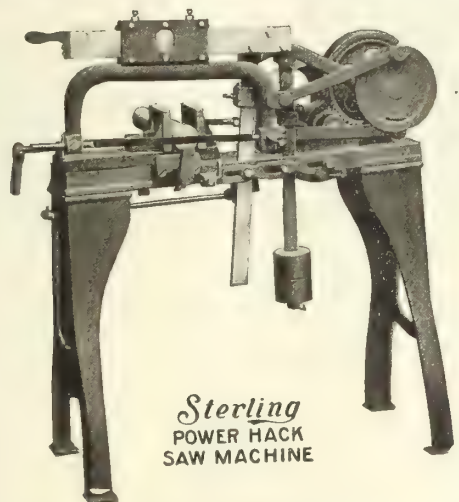
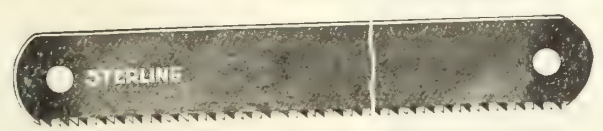
Write for booklet on subject.

TAYLOR & ARNOLD, Limited

MONTREAL

WINNIPEG

"STERLING" Hack Saws



Sterling
POWER HACK
SAW MACHINE

Manufactured by

DIAMOND SAW & STAMPING WORKS,
BUFFALO, N.Y., U.S.A.



A Clear Track To Promotion

How to get off the side-track—how to break the couplings that hold them near the bottom of the pay roll—is the one big problem that troubles most railroaders.

There's a clear track to promotion—without grade or curve—open to the man that has the backbone and grit to take it. Before you can travel this track to promotion and bigger pay you must "coal up" with knowledge—you must be specially trained.

The Railway Instruction Department of the International Correspondence Schools is able and ready to give you the training you must have. You can get it right at home without losing an hour's time from your present job.

It will not cost anything to find out how the I.C.S. can train you for a better job. Put an "X" near the class of work you would like to follow, in the attached coupon, and mail it to the I.C.S. This won't obligate you in the least. It will simply bring full information by return mail.

Mark the Coupon NOW

International Correspondence Schools
Box 1072, Scranton, Pa.

Please explain, without obligation to me, how I can qualify for the position indicated by the letter X

Locomotive Engineer Air-Brake Inspector Air-Brake Mechanic R. R. Signalman R. R. Ticket Collector R. R. Freight Agent R. R. Passenger Agent R. R. Accountant R. R. Inspector	Marine Engineer Ocean Navigation Lake Navigation Coastwise Navigation Electrical Engineer Electric Car Running Bridge Engineer Highway Engineer Tel. and Tel. Engineer Mechanical Engineer
--	---

Name _____
 St. and No. _____
 City _____
 Present Occupation _____
 Enclosed is _____

Which Method

prevails in your plant? Does it take two men to do one man's work.

Why don't you replace that old antiquated tool with a new up to date

Reece's New Screw Plate

These pictures do not exaggerate conditions as you can actually see them, if you will visit Machine Shops throughout the country.

Lessen your cost by giving your mechanics a REECE'S NEW SCREW PLATE.

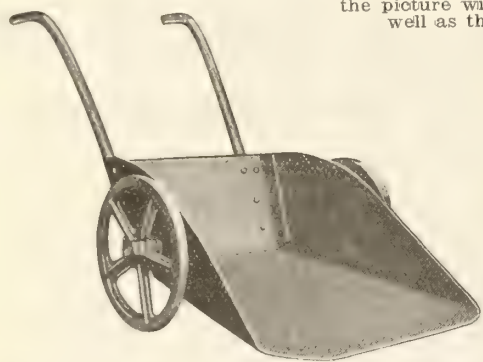
BUTTERFIELD & CO., Inc.
ROCK ISLAND, QUE.



Box-Car Un- loaders



Not as bad as it looks, for they are both laughing—but the picture will give you an idea of the strength, as well as the size of these Box-car Unloaders.



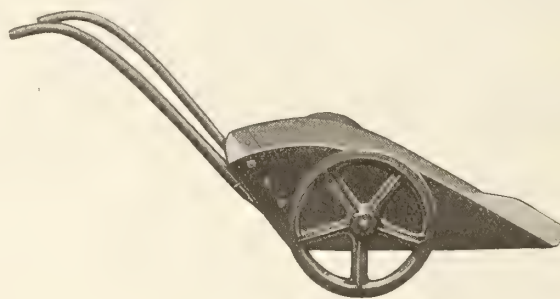
¶ The Wheels are cast iron, running on roller-bearings with forged axles.

¶ The Tray—about 30" x 30" x 11" deep—is made of heavy sheet steel, the handles of pipe, making the whole Unloader very light and very strong.

¶ Can be used for unloading and carrying Coal, Grain, Sand, Cement, Gravel, Coke, etc., etc.

PRICE \$25.00 EACH

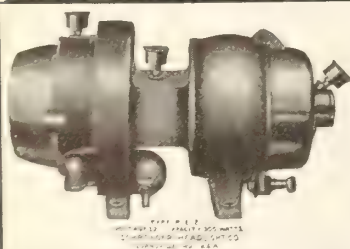
Special discounts allowed on quantities.



Write for prices and further particulars to the Manufacturers

POLSON IRON WORKS, Limited, TORONTO, ONT.

Steel Shipbuilders, Engineers and Boilermakers.



70 Schroeder Incandescent Headlights

In Service

270 days without any expense for repairs. As a result of this exceptional service 150 more have just been ordered.

The HIRAM L. PIPER CO., Limited

MONTREAL, Sole Agents for Canada

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. BABBITTS. Miscellaneous Brass Castings for Railroads.

Works and Office: 69 DELORIMIER AVENUE, MONTREAL, QUE.

STANDARD Wires and Cables

Wire Rods,
Bare Copper Wire,
Brass and Bronze Wires,
Standard C.C.C. Wire,
(Colonial Copper Clad)
Magnet Wire,
Weatherproof Wire,
Rubber Insulated Wires,
Varnished Cambric Cable,
Fibre Lead-Covered Cable,
Paper Lead-Covered Cable,
Rubber Lead-Covered Cable,
Armored Cable,

and Cable Accessories

Cable Terminals,
Cable Junction Boxes,
"Ozite" Insulating Compounds,
Miscellaneous Cable Accessories of
all Kinds,
Cable Installations.

For detailed information, samples, estimates or prices, write our nearest office.

**Standard Underground Cable
Co. of Canada, Limited,**

Hamilton, Ont.

Montreal, Que. Seattle, Wash.
Winnipeg, Man.

ESTABLISHED 1849.

BRADSTREET'S

Capital and Surplus, \$1,500,000.

Offices throughout the Civilized World.

Executive Offices:

NOS. 346 and 348 BROADWAY,
N. Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished, and are available only by reputable wholesale, jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA: Halifax, N.S.; Hamilton, Ont.; London, Ont.; Montreal, Que.; Ottawa, Ont.; Quebec, Que.; St. John, N.B.; Toronto, Ont.; Vancouver, B.C.; Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.; Victoria, B.C.

THOS. C. IRVING,
Gen. Man. Western Canada, Toronto.

CONSOLIDATED

Electric Heaters with
Thermostatic Control
for Economy—Comfort
Satisfaction.

Write us your requirements

Consolidated Car-Heating Co.

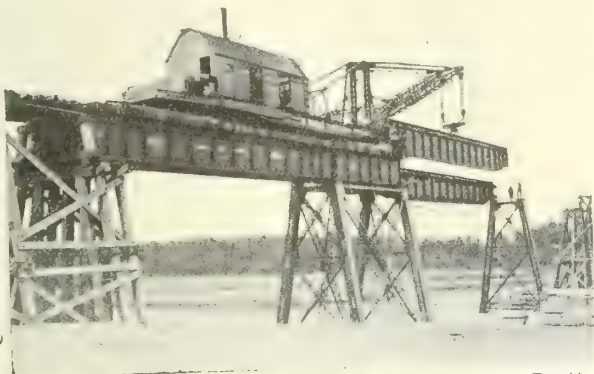
Albany N.Y., U.S.A.

Dawson and Co., Agents: 148 McGill St., Montreal, Que.

January, 1916.]

"BEATTY" HOISTS

For situation where the work is severe and the service exacting—"a Beatty always fills the bill"



Derrick car engined with an 8 x 12 four drum Beatty hoist placing an 80 foot deck plate girder span in Skugog River Bridge.

Let us know your requirements for
Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

We will gladly send full information.

M. BEATTY & SONS Limited - WELLAND

Toronto Office—Goodyear Bldg. Telephone Adelaide 208.
Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg., Winnipeg.

DOMINION BRIDGE COMPANY, LIMITED

Head Office and Works,
MONTREAL, P.Q.

Branch Offices and Works,
TORONTO, OTTAWA AND WINNIPEG.



Lachine Bridge.

Engineers, Manufacturers and Erectors of Steel Structures.
CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

LARGE STOCK OF STANDARD STRUCTURAL MATERIAL AT ALL WORKS.

The Ottawa Car Manufacturing Co., Limited

Builders of

Electric Cars, Snow Sweepers and Plows

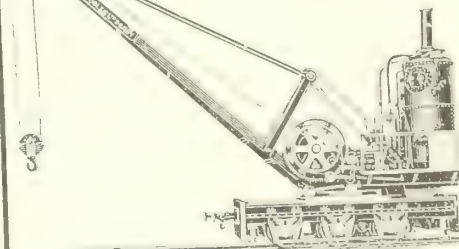
Also

Producers of Brass Castings of Every Description.

Slater St. - Ottawa

HENRY J. COLES LIMITED

Derby, England



Makers of Steam and Electric Travelling Cranes, Overhead Electric Cranes, Single and Double Chain Grabs, Steam Navvies, Petrol and Oil Motor-driven Cranes, Shunting and Breakdown Cranes.

Telegrams: "Coles, Derby."

The Preston Car & Coach Co., Limited

PRESTON, ONT.

MANUFACTURERS OF

Steam and Electric Railway Cars and Special Cars.

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Celebrated Wheel Truing Brake Shoe. Best Wheel Grinders in the World.



28 "Service" Branches Throughout Canada

CANADIAN CONSOLIDATED
RUBBER CO., LIMITED
MONTREAL, P. Q.



Resolved:

That, quality and value being
equal, I will give preference
during 1916 to Rubber Goods
"Made in Canada".



CANADIAN CONSOLIDATED
RUBBER CO., LIMITED
MONTREAL, P. Q.

28 "Service" Branches Throughout Canada



Canadian Railway and Marine World

January, 1916.

The Building and Operation of the Welland Ship Canal Construction Railway.

By A. C. Harris, Superintendent, W. S. C. C. Railway.

In connection with the construction of the Welland Ship Canal, between Lakes Ontario and Erie, the Department of Railways and Canals has built, and fully equipped, a double track, standard gauge, construction railway along the west side of the ship canal's route from the lower end of section 3, near Merritton, Ont., to Lake Ontario, a distance of 6.3 miles. In addition, there is siding accommodation for 165 cars.

It is not the Department's intention that this railway should compete with commercial railways in the handling of freight and passenger traffic, the road having been constructed, and now being operated and maintained, solely for the free use of the contractors for sections 1, 2 and 3 in hauling excavated material from their respective works to Lake Ontario, where it is deposited to form dykes or embankments on either side of the new harbor at Port Weller; also for moving crushed stone from the crushing plant, and sand from the interchange tracks, near Merritton, to their different works. The contractors also handle structural steel, piling, cement, coal and other materials, which is delivered to them on the interchange tracks with the Grand Trunk, and the Niagara, St. Catharines and Toronto Railways, at Merritton, over the construction railway to points on their sections where these materials are to be utilized.

Style of Construction.—The railway was built in a semi-permanent manner with 60 lb. A.S.C.E. rails on a good class of ties, spaced 2 ft. centres and ballasted with crushed stone and gravel. The maximum gradient against southbound traffic is 1.50%, and against northbound traffic 0.5%, the maximum curvature being 60°, except in yards at Merritton and Port Weller where 12° is used. The contractors for sections 1 and 2 were required, under the terms of their contracts, to do all the grading on the railway within the limits of their contracts, and the contractors for section 2 ballasted the whole line with gravel from a pit located in the canal prism on that section. This was afterwards supplemented by crushed stone. The tracklaying was done by the Department.

Crossings.—The construction railway crosses the Niagara, St. Catharines and Toronto Ry., Lake Shore Division, at Port Weller, the crossing being protected by a 10 lever mechanical interlocking plant.

Just below lock 11, the railway crosses the present Welland Canal, and for this crossing a double track steel railway swing bridge, the superstructure of which was constructed and erected by the Hamilton Bridge Works Co., has been erected. The traffic over the bridge is protected by semaphores and derails, operated by a 2-lever mechanical interlocking plant in the bridge operator's cabin. The bridge is operated by electricity.

At the principal highway crossings of the railway, crossing watchmen are stationed and crossings are further protected by crossing gates.

Track Scales.—A short distance north of the crushing plant the 150-ton railway track scales, which will weigh a train of cars 110 ft. long, are located. All stone

leaving the crushing plant for sections 1 and 2 is weighed over these scales.

Signalling.—The railway is equipped with 11 mechanical interlocking plants, four of which are 4-lever, five 5-lever, one 2-lever



A. C. Harris.
Superintendent, Welland Ship Canal Construction Railway.

Contractor.	Section.	Locomotives.	Dump cars.	Flat cars.	Ballast cars.	Cranes.	Total cars.
Dominion Dredging Co.	1	2	15	2			19
Baldry, Yerburgh & Hutchison	2	23	152	23	8		186
Confederation Construction Co.	3	3	126			1	130
Government		1		2			3
Total		29	293	27	8	1	358

and one 10-lever plants, all connecting parts of which are in accordance with R.S.A. standard drawings and specifications. These plants were supplied and installed by Saxby & Farmer, Ltd., of Montreal. Provision has been made for sealing the locking in such a manner as to prevent interference by any but authorized employees.

Train Dispatching.—The road is fully equipped with a selective telephone train dispatching system and a telephone blocking system, which were supplied and installed by the Northern Electric Co., of Montreal. The equipment is so arranged that connection can be made to any of the block signal offices through the blocking circuits by means of a patching device located in the block offices, thereby making the blocking circuit and the train dispatching circuit interchangeable.

At the several points on the railway where the contractors come on to the road over their own sidings, operator's cabins have been erected and fully equipped for the

housing of the mechanical interlocking levers and telephone train dispatching instruments.

Wrecking Crane.—For the purpose of clearing up of wrecks the railway is provided with a 50-ton capacity Industrial Works locomotive crane, supplied by F. H. Hopkins & Co., Montreal, and fully equipped to safely handle at 30 ft. radius 12,000 lbs., without outriggers, and to swing the load through full circle and move along the track with boom in any position; crane also capable of hoisting and rotating with outriggers fully extended and supported, 100,000 lbs. at 16 ft. radius, the hoisting, travelling and rotating being used simultaneously or independently.

System of Operation.—The railway is operated and maintained by the superintendent of the line, the contractors furnishing their own equipment and necessary train crews, who are required to pass an examination as to hearing, sight, ability to distinguish colors, and as to the meaning of the rules and signals in use, and who are under the superintendent's order in all matters pertaining to the operation of trains over the construction railway.

The normal traffic is controlled by telephone block system, but in case of an accident where one main track is obstructed, the other track is used under single track rules, and trains are operated by train order.

During the summer and autumn, when the contractors along the line of the canal are working at heavy pressure, and day and night, night operation over the road is necessary. During the balance of the year the road is only in operation 12 hours a day.

Following is a statement showing the number of locomotives and the approximate number of the different classes of other rolling stock on the line:

Following is a statement showing the amount of traffic handled over the railway since it was put into operation on June 25, 1914, until Oct. 31, 1915. During the two months of Feb. and Mar., 1915, the contractors were practically closed down on account of cold weather, and consequently the traffic over the road was very light.

Excavated Material.		Total
6-yard cars	161,692	
12-yard cars	1,834	
16-yard cars	1,010	
30-yard cars		
Total cars		238,885
Stone (233,736 tons)	8,178	
Sand	1,131	
Miscellaneous cars ..	411	
Grand total of cars		249,102

The number of trains, loaded and empty handled over the railway since operation commenced is 18,178, and there have been no accidents resulting in personal injuries to employees or other persons and the num-

ber of accidents which have been in the nature of derailments has been comparatively small, and the consequent damage to plant and equipment very low.

There are, at present, five track gangs at work on the line doing the necessary track repairs and other maintenance work. Owing to the abnormal traffic over the road, and the fact that it has been constructed re-

cently, the maintenance work is necessarily very heavy, and much attention must be given to this work at all times.

A storehouse and a small machine and general shop for the handling of necessary repair and maintenance work of the railway are located at Port Weller, the northern terminus.

The Superintendent's headquarters and

dispatching offices, a commodious two story building, is located at Homer, Ont.

The road was constructed by J. F. Pringle, B.A., A.M.Can.Soc.C.E., Resident Engineer, and the operation and maintenance is under the jurisdiction of A. C. Harris, Superintendent, under the direction of J. L. Weller, M.Can.Soc.C.E., Engineer in Charge, Welland Ship Canal.

The Canadian Northern Railway's Bridge Over the Riviere-des-Prairies.

The Canadian Northern Ry.'s Montreal-Hawkesbury section of its main trans-continental line approaches Montreal from the west, crossing the west and main channels of the Riviere-des-Prairies, or what is commonly called the Back River, 12 miles northwesterly from Montreal. The main crossing is composed of two through truss spans 150 ft. c. to c. of bearings, one through truss span, 275 ft. 0¾ in., and one 75 ft. through plate girder span, making a

real and anchored securely in place under the projecting portion of span. Upon the scow was built necessary blocking to reach the lower chords of truss. The counterweight was then removed, and a very heavy truck, running on a standard gauge track, was placed under the extremity of the land end of the truss.

The next work was to pump out sufficient water from the scow to raise it and thus take most of the weight of the truss

further lowering to seats and removing blocking was carried out by the use of powerful jacks. This operation was carried out successfully on Sept. 17, 1914. The erection of the two 150 ft. trusses was carried out on falsework.

The crossing of the west channel, about ½ mile west, is of much less importance, the channel being almost dry for a short period in summer. It is composed of five 80 ft. half through plate girder spans with central piers on the angle of the stream. All the substructure of concrete. The weight of steel in this crossing is about 689,000 lbs., and of concrete 1,600 cu. yds.

All the steel work was designed to the Dominion Government specification, 1908, class heavy loading, and was fabricated and erected by the Dominion Bridge Co., Montreal, with E. Mackinnon, Resident Engineer, in charge. The substructure was built by J. P. Mullarkey, Montreal. We are indebted to W. P. Chapman, M.Can.Soc.C.E., Engineer of Bridges, Mackenzie, Mann & Co., Ltd., for the foregoing information and for the photographs of the main span of the east channel crossing, from which the accompanying illustrations are made.

Railway Electrification in England.—The electrification of a portion of the Lancashire and Yorkshire Ry., between Manchester and Bury, approximately 11 miles, is expected to be ready for operation early in January. The work has been carried out by the company's staff, and the rolling stock has been built in the company's shops at Newton Heath, Manchester. The cars are of all steel construction, and each unit is a 5 car train, of 3 motor cars and 2 trailers. The motor cars are each equipped with four 200 h.p. motors.

Toronto Transportation Club.—The annual dinner was held, Nov. 29. The officers for the current year are,—M. G. Murphy, C.P.R.

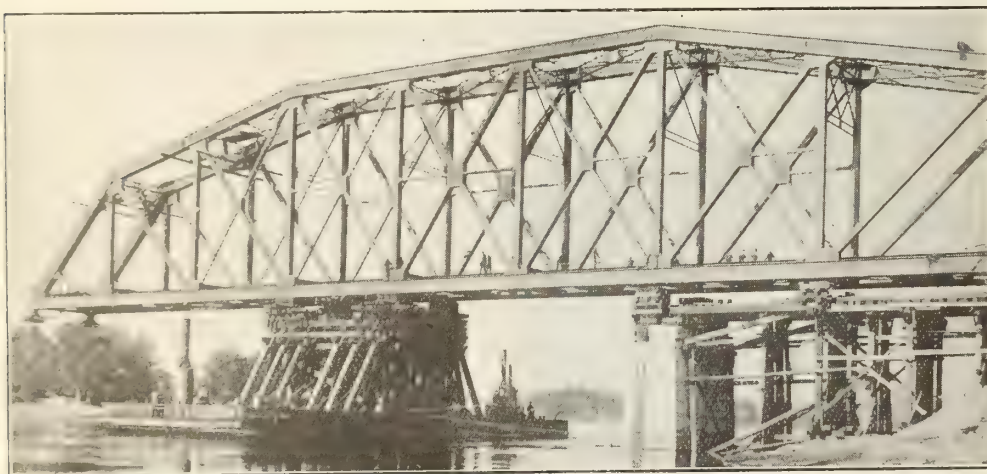


Fig. 1.—First Stages of Launching Span, Riviere-des-Prairies Bridge.

total length between face to face of ballast walls of 662 ft. 5¾ ins. The piers and abutments are of the usual concrete type, with spread footings, and are at right angles to the centre line of the track, which track is a tangent and has a level grade over the whole crossing.

The 150 ft. spans are 6 panel through Pratt trusses of the following dimensions: 150 ft. c. to c. end bearings, 18 ft. c. to c. trusses, 30 ft. c. to c. chords. The 275 ft. 0¾ in. span is of the curved top chord type and has the following dimensions: 275 ft. 0¾ in. span c. to c. end bearings, 31 ft. c. to c. chords at the hips, and 45 ft. at the centre of the span, the trusses being 19 ft. c. to c. The 75 ft. through plate girder span is of the standard type with the girders placed 17½ ft. c. to c. The stringers are four to a panel and the distance, base of rail to centre of bottom chord, varies from 3 ft. 8¾ in. for the 150 ft. spans to 3 ft. 4 in. for the 275 ft. 0¾ in. span. The total weight of steel in the channel (275 ft. 0¾ in.) span is 550 tons, and in the whole crossing about 2,000,000 lbs. About 2,100 cu. yds. of concrete were used in the whole crossing.

Owing to the very swift and deep current, the contractors, after considering several methods of erection, decided to adopt the one of launching by use of a scow. The plan followed was to erect the whole span in a temporary position, with slightly more than half of the length projecting over the supports riverward, the land end being held down by a heavy counterweight of steel rails. With the erection practically completed a large scow was taken from Mont-

and at the same time clear the blocking over the forward pier in the stream. This having been successfully carried out, the cables from the scow were attached to a pier beyond the main channel, and taken back to a stationary engine located on the track about 50 ft. east of the end of the truss. At a given signal the engine started and the span commenced to move, being carried slowly by the scow to its position over the



Fig. 2.—Span in Position Over Pier Ready to Lower to Permanent Position, Riviere-des-Prairies Bridge.

piers. In a work of this kind it necessarily follows there must be some adjusting of cables, guys, windlass, etc., but there was no serious hitch or delay, and the span was moved about 120 ft. to its position over piers in about an hour and a half.

It was then necessary to allow water into the scow to sink it about 18 ins. and bring the forward end of the truss down firmly to the blocking on the mid-stream pier. The

President; T. Marshall, Board of Trade, C. E. Horning, G.T.R., Vice Presidents; W. A. Gray, Delaware, Lackawanna and Western Ry., Secretary; M. Macdonald, G.T.R., Treasurer. The executive committee consists of, John Gray, M. H. Brown, J. H. Bennett, D. C. Wood, John Thomson; and the chairmen of committees are,—F. V. Higginbottom, Entertainment; W. McIlroy, Membership; J. M. Copeland, Sick.

Railway Mechanical Methods and Devices.

Cutting Off Rivet Heads in Grand Trunk Railway Shops.

A holder-on for use with the pneumatic rivet-buster for cutting off rivet heads on the sides of boilers, is in use in the G.T.R. shops at Stratford, Ont., which facilitates the work materially, reducing considerably the labor of the operators. The bull and holder-on are shown in the accompanying illustration. The holder-on consists of a small air cylinder hinged to the side of the bull cylinder. The piston rod of the holder-on has a hook at the outer end, by which it is attached to some near by projection of the boiler, such as the ashpan studs in the illustration, so that when the chisel on the end of the bull plunger is placed against the rivet head, by turning on the air in the holder-on cylinder, the chisel is held firmly

Boring Stuffing Boxes in Steam Chests, Grand Trunk Railway Shops.

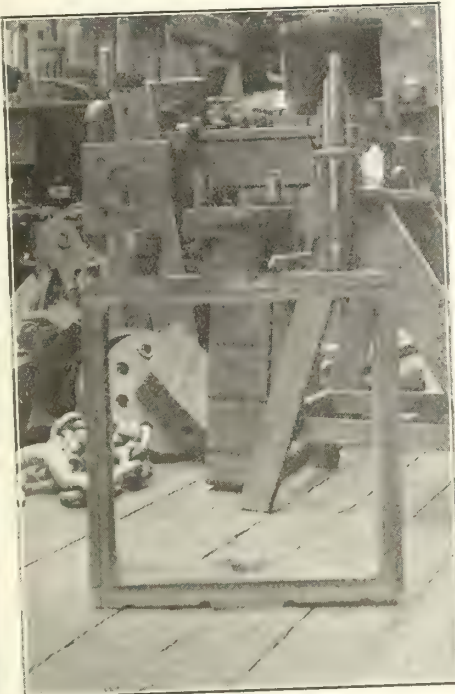
The tools used in boring out stuffing boxes in steam chests in the G.T.R. shops, at Stratford, Ont., are shown in the accompanying illustration. The holes for the stuffing box and the tail rod are cored in the chest. The chest is first planed on its faces and the stuffing box end, the stud holes are drilled and tapped. The chest is then bolted to a face plate under the radial drill, and squared up. On the stuffing box face is bolted a jig as shown, using the stud holes, cap bolts being used. A reamer of the shape of the stuffing box is forced down through the cored hole, reaming out the hole to the correct shape in one pass. The tail rod hole is finished in a similar manner, the jig on the left of the stuff-

ing box in the illustration being used for the purpose of the block, which is a cast iron body, drilled and reamed with tapered holes, varying in diameter by sixteenths. As the pin is turned it is removed from the lathe, fitted in the block, in the hole marked a particular size, and the distance it enters noted. An allowance is made for drift, so that, if it fits in a hole a predetermined size larger than that for which it is made, up to a certain point, it is correct. The amount the diameter is to be reduced, if too large, is recorded by noting the hole in which the pin will fit.

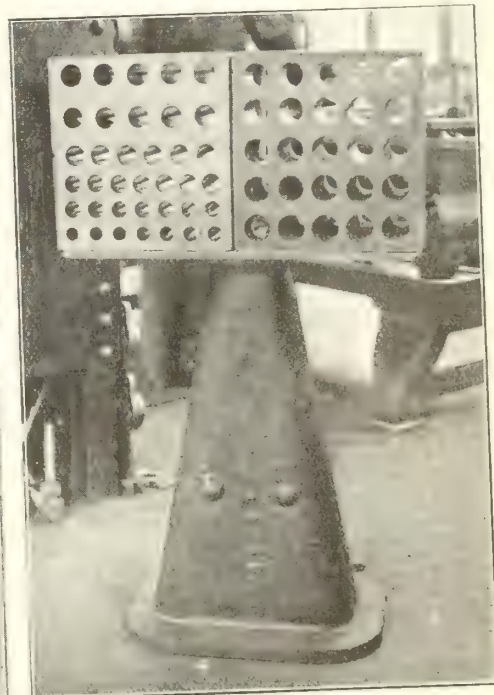
In the Stratford shops, two of these blocks are mounted on a cast iron pedestal, as shown, which makes it convenient for all the mechanics in the shop. Other shops on the G.T.R. use the same system of blocks, but in the Montreal shops, when last visited by the writer, they were loosely mounted on blocks on the floor.



Pneumatic Holder-on Used With the Bull for Cutting Off Rivet Heads.



Boring Stuffing Boxes in Steam Chests.



Taper Pin Test Block.

against the rivet head, reducing the labor of the operators. In this particular case, the holder-on is applied to a 2 in. bull. Larger holders-on are used with the 4½ in. bull, which is used largely for cutting stay-bolts between the sheets.

In cutting off the heads of rivets along the side of the boiler, a movable trestle frame is used for holding the bull as shown. The bull is suspended from a runway along the top of the frame, so that longitudinal adjustment is thereby obtained, vertical adjustment being secured by the block and tackle which suspend the bull.

ing box in the illustration being used for the purpose. Four holes are drilled and tapped in this end, and the chest bolted to the face plate as before. Another reamer of correct shape is run down through the cored hole, finishing it to size in one pass. This practice is followed in all the sizes of chests used, different jigs and reamers being kept specially for the purpose. A clean job is obtained with a fraction of the labor that would be involved in boring the holes out. Even when the holes are cored slightly eccentric, the reamers appear to perform the work quite satisfactorily, maintaining their cutting edges in spite of the sand in the cored hole.

Taper Pin Test Block in Grand Trunk Railway Shops.

The accompanying illustration shows a taper pin testing block as used in the G.T.R. shops at Stratford, Ont. In locomotive construction, a large number of taper pins of varying sizes, but all of the same taper, are employed. These are made to fit the hole reamed for the purpose, and are driven home with a sledge. To allow

Home Made Tool Bends Reinforcing Bars of Several Sizes.

A small home made bar bender has been used successfully by the writer for bending cold bars up to 1¼ in. diameter, where not greater than 90 deg. bends were required. The apparatus consists essentially of a cast iron plate containing two lugs between which the bar is placed, a steel lever fastened to the plate by means of a steel pin, about which it acts, and a set of fillers, as shown in the accompanying sketch.

The cast iron plate can be cast of coarse metal in any foundry, the top of the plate with which the lever comes in contact being machined. The bolt holes, certain ones of which must be countersunk to allow free action of the lever, may be either cored or drilled. The space between the two lugs should be slightly larger than the largest size bar to be bent. The filler is a device made of strap iron by any blacksmith, which fits around the lug opposite the lever, to insure a tight fit for bars smaller than the maximum. A set of these to accommodate the various commercial sizes of steel bars can be made at small cost. To insure a

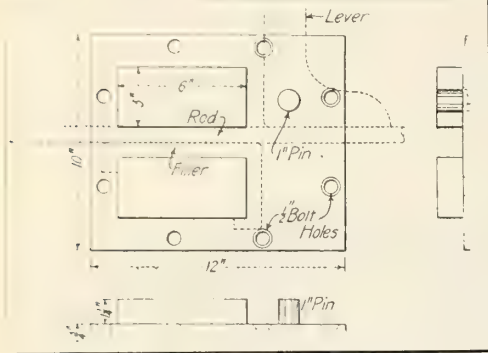
Hamilton Contributions to Patriotic Fund.
—Among the principal contributors to the Canadian Patriotic Fund in Hamilton, Ont., recently, are the Steel Company of Canada, \$12,000; Robt. Hobson, Vice President, Steel Company of Canada, \$12,000; Mrs. Robt. Hobson, \$500; Dominion Power & Transmission Co.'s employees, \$7,000; Toronto, Hamilton & Buffalo Railway, \$2,400.

Canadian Pacific Ry. shareholders holding not more than 50 shares each are said to have increased from 14,000 in 1907 to over 36,000.

good fit, the edges of the lug around which the filler is placed should be machined. The lever is made of 1 x 2 in. flat steel forged to shape, with the face engaging the bar slightly upset on the upper side. Its length is about 4 ft.

The operation of the apparatus can be readily seen in the accompanying sketch, in which the lever bar to be bent and a filler are shown dotted. The apparatus is fastened to a bench by means of bolts, and counter-sunk so that the top of the plate is flush with the top of the bench.

Two men can make cold bends under one inch in diameter. On larger sizes three men



An Inexpensive Bar Bender.

are required, unless recourse is had to a pipe extension to the lever. The cost of the apparatus should not exceed \$12 to \$15, and it will readily pay for itself on a small job which will not admit of a more versatile bender.—R. C. Hardman, in *Engineering Record*.

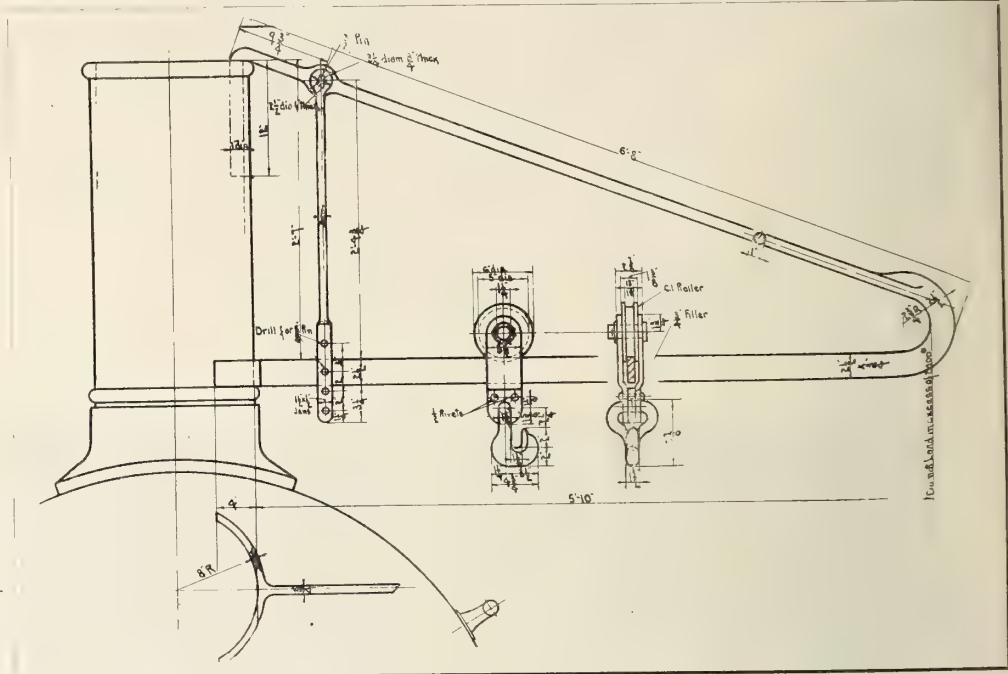
Cutting Out Tubes in Michigan Central Railway Shops.

The usual practice in cutting out flues when the boiler is being stripped for shopping is to mount an air cylinder with reducing gear on a cross bar across the front end of the smoke box, running a shaft with universal joints from the stationary motor to the tube in which the cutter is inserted. This practice has been modified at the Michigan Central Rd. locomotive shops at

that only an angularity in a vertical plane is to be contended with, instead of a combined angularity in both the vertical and horizontal planes.

In the same shops, the cutter used for ripping out superheater flues is as also

containing four pin holes for adjusting the length for varying heights of stacks, the two arms of the crane being readily sprung. A small traveller operates along the horizontal member, to which a block and tackle are attached, which makes it very con-



Stack Crane of Simple Design.

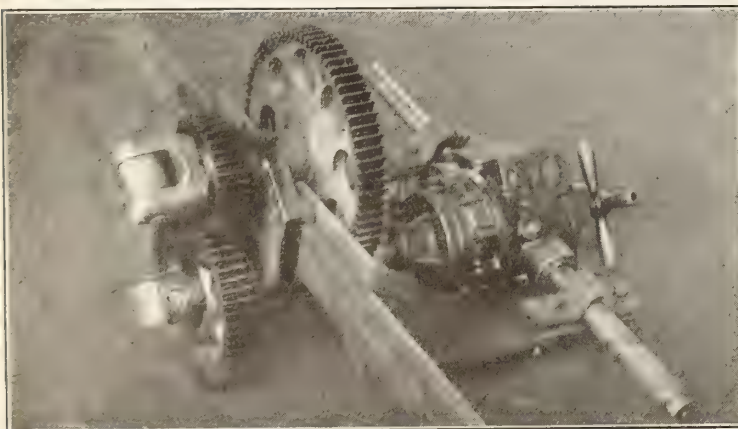
shown in the accompanying illustration. The inner shaft, which has an angular movement through about 120 degrees, has two ball bearing races between it and the encasing shell, so that the heavy strain set up between the shaft and shell, due to the cutting tool piercing the flue, is reduced.

Stack Crane in Canadian Northern Railway Shops.

Stack cranes for locomotive houses and shops are in more or less general use, so that the one illustrated herewith is of

venient for raising and lowering the locomotive cylinder and valve parts without the use of an auxiliary crane.

Transportation Interests and the War Loan.—Among the many subscribers to the recent successful war loan issued by the Dominion Government, the following referred to in the daily press are intimately connected with transportation and allied interests in the Dominion.—Estate of the late James Ross, per J. K. L. Ross, director, C.P.R., \$500,000; R. B. Angus, director, C.P.R., \$100,000; Sir Thomas Shaughnessy, President, C.P.R., \$100,000; Sir Herbert S.

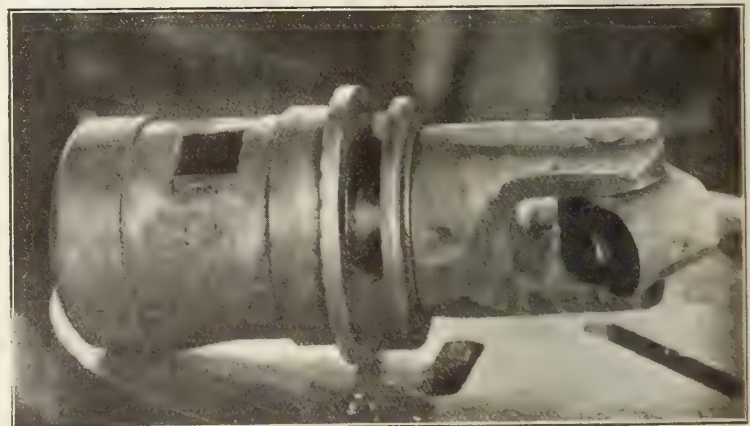


Adjustable Arrangement of Air Motor in Cutting Out Tubes.

St. Thomas, Ont., in such a way as to make the arrangements more flexible, reducing the strain on the transmission shaft with its universal joints.

In the arrangement at these shops, instead of the motor and reducing gear being stationary, the combination is so mounted on a cross bar that it may be shifted from side to side. By this means, the angularity of the connecting shaft is materially reduced, as it is always possible to place the motor vertically opposite the tube being cut, so

interest merely in showing a simple but strong design. The frame is a one piece member, the horizontal section being $2\frac{1}{2} \times \frac{3}{4}$ ins., and the diagonal member 1 in. diameter. The horizontal member has a two piece foot, bracing against the foot of the stack, and the diagonal member has a vertical end to fit down inside the stack. Joining the horizontal and diagonal members near the stack, there is a connecting link, permanently connected to the diagonal member, and with the lower end



Ball Bearing Cutter Head for Cutting Superheater Flues.

Holt, director, C.P.R., \$100,000; Montreal Light, Heat and Power Co., \$100,000; Elder, Dempster and Co., steamship owners, \$50,000; Farquhar Robertson, Montreal Harbor Commissioner, \$50,000; W. G. Ross, Chairman, Montreal Harbor Commissioners, \$50,000; Hugh Paton, President, Shedden Forwarding Co., \$25,000; Dominion Transport Co., \$25,000.

The Canadian Society of Civil Engineers annual meeting will be held in Montreal, Jan. 25, 26 and 27.

January, 1916.]

Relation Between Tractive Effort and Adhesive Weight of Locomotive Driving Wheels.

Contributed by a Subscriber

Capacity is the keynote of present day operation. For the non-technical official, capacity as applied to motive power denotes one comparison only, viz., the ability of the locomotive to grip the rails and handle a certain tonnage. He does not generally consider boiler dimensions, wheel arrangement or the merit of the design involved. It is now the practice for most railways to rate locomotives by the available tractive effort at the drivers. This is a good system to follow, because it is not affected through any factor of resistance, curvature or wheel arrangement, such as would have to be taken into account with the practice of rating in terms of hauling capacity behind the tender.

The effort which a locomotive can exert to haul a train is limited by the adhesion between the driving wheels and the rails. The adhesion is simply friction between the driving wheels and the rails, acting to prevent slipping. If, for instance, the train resistance exceeds the adhesion, the driving wheels will slip, or in other words turn around without advancing.

Some 20 years ago, assuming comparatively good conditions, and for small locomotives, it was the practice to use a factor of 0.20 to denote the adhesive force. As an example, if the weight on the drivers was 40,000 lbs., the adhesive force would be 8,000 lbs. Not until 1904 was an effort made, so far as the writer is aware, to accurately determine the maximum available adhesive force at the rail. At that time one of the large locomotive builders tested six different types of locomotives, embodying the best practice at that time. These six classes comprised orders totalling 143 locomotives. The results of these tests were as follows:

Class.	Max.	Min.	Avg.
Consolidated, 2-8-0	0.283	0.186	0.233
Mogul, 2-6-0	0.222	0.184	0.210
Pacific, 4-6-2	0.246	0.202	0.220
Atlantic, 4-4-2	0.275	0.190	0.229
American, 4-4-0	0.269	0.182	0.231
Ten Wheeler, 4-6-0	0.267	0.172	0.200

The following table gives results of tests on a number of locomotives within the last seven years:

Railway.	Class.	Adhes. Factor.	Remarks.
Chicago, Burlington and Quincy	Prairie, 2-6-2	0.228	Saturated
Atchafalpa, Topeka and Santa Fe	Switcher, 0-6-0	0.202	Saturated
Erie	Pacific, 4-6-2	0.238	Superheated
Chicago and North Western	Pacific, 4-6-2	0.244	Superheated
New York Central and Hudson River	Ten Wheeler, 4-6-0	0.196	Saturated
Baltimore and Ohio	Consolidation, 2-8-0	0.218	Saturated
Chesapeake and Ohio	Mikado, 2-8-2	0.255	Superheated
Southern	Mikado, 2-8-2	0.240	Saturated
Illinois Central	Mikado, 2-8-2	0.236	Superheated
Illinois Central	Pacific, 4-6-2	0.220	Superheated
Grand Trunk	Pacific, 4-6-2	0.230	Superheated
Buffalo, Rochester and Pittsburgh	Pacific, 4-6-2	0.222	Superheated
Buffalo, Rochester and Pittsburgh	Atlantic, 4-4-2	0.255	Saturated

For several years, practically all new locomotives have been equipped with superheaters, brick arches or other appliances which tend to greatly increase the capacity and sustaining power of the boiler. In superheater locomotives, the steam is to some extent wire drawn in the superheater; hence the initial pressure at the beginning of the stroke may not be as high as in the saturated locomotives. On the other hand, owing to the superheat, the mean effective pressure under similar conditions will be higher and more constant, thus ensuring an appreciable reduction in slipping, which may be taken advantage of in designing superheater locomotives.

It is generally considered that a ratio of about 0.22 or 0.23 is the most desirable for

general conditions, but many freight locomotives have been built with a ratio of 0.25, and in some cases as high as 0.27. When the tractive force attains a factor of 0.27 of the weight on the driving wheels, there must be abnormally good rail conditions in order to realize the full power; this probably cannot be done unless plenty of sand is used. With ideal conditions there would be no real difficulty in using a ratio of 0.25.

As a general proposition, where two locomotives have the same comparative boiler capacity, the one locomotive having a ratio of tractive power to adhesive weight of 0.25, and the other of 0.20, in rating it would be feasible to take full advantage of the power up to a ratio of 0.25, unless the rail conditions are out of the ordinary. The above considers maximum conditions only, and should therefore not be exceeded.

Great Northern Railway's Annual Report.

The 26th annual report of the Great Northern Ry. Co. (U.S.A.) for the year ended June 30, 1915, shows that the total capital stock outstanding was \$249,476,722; and the bonded debt \$194,773,909.09, an increase of \$1,649,000. The expenditures during the year on new lines were \$686,788.66, of which \$7,916.08 was on the line south of the International Boundary in Montana, west of Niobe to Surrey; \$1,591.47 on the line from Niobe to a connection with the Grand Trunk Pacific Ry. at Gateway, Sask.; and \$446,095.34 on the line from Wenatchee, Wash., to Oroville, making a junction with one of the sections of the Vancouver, Victoria and Eastern Ry., passing into Washington State.

The company's investments in Canadian lines on account of advances made to pay for property, construction, additions and betterments has been increased during the year as follows: Crowsnest Southern Ry., \$8,289.60; Vancouver, Victoria and Eastern Ry., \$951,524.48; New Westminster Southern Ry., \$2,017.46; Midland Ry. Co. of Manitoba, \$84,203.48, total, \$1,046,035.02.

expenses were \$36,828,274.60 against \$47,769,773.98 for 1913-14. After meeting all fixed charges, paying four quarterly dividends of 1¼% each, and providing for accrued interest and taxes, there remained to be carried to profit and loss account \$2,096,762.32.

The balance sheet shows liabilities of \$687,459,879.11 with assets of various kinds valued at that figure. The assets include the following investments in Canada:—Midland Ry. of Manitoba, \$2,356,773.61; Manitoba Great Northern Ry., \$2,066,000; Brandon, Saskatchewan and Hudson Bay Ry., \$2,150,000; Crowsnest Southern Ry., \$4,218,487.02; Bedlington and Nelson Ry., \$65,000; Nelson and Fort Sheppard Ry., \$2,119,019.51; Red Mountain Ry., \$310,619.07; Vancouver, Victoria and Eastern Ry. and Navigation Co., \$21,881,524.48; New Westminster Southern Ry., \$280,250.27; total, \$35,347,673.96.

The company operated over 8,121.52 miles of line at June 30, 1915, against 7,822.01 miles at June 30, 1914, being an increase of 299.51 miles, which included 25.39 miles of the Vancouver, Victoria and Eastern Ry. between Colemount and Brookmere. The mileage operated included 7,112.99 miles of line owned (the company owns 17.66 miles in addition which are leased to other companies) by the G.N.R.; lines owned by controlled companies 690.93, of which the following are in Canada:—Midland Ry. of Manitoba, (jointly with the Northern Pacific Ry., 6.40 miles; Manitoba, Great Northern Ry., 91.77 miles; Brandon, Saskatchewan and Hudson Bay Ry., 69.45 miles; Crowsnest Southern Ry., 74.18 miles; Bedlington and Nelson Ry., 12.04 miles; Nelson and Fort Sheppard Ry., 58.42 miles; Red Mountain Ry., 9.59 miles; New Westminster Southern Ry., 23.73 miles; Vancouver, Victoria and Eastern Ry., 261.67 miles; the remaining mileage representing trackage rights over other companies' lines of which the following are in Canada:—Canadian Northern Ry., from International boundary at Noyes, Minn., to a connection with the Midland Ry. of Manitoba tracks at Winnipeg, 66.57 miles; Canadian Northern Ry. and Grand Trunk Pacific Ry. at Winnipeg, 1.68 miles; G.T.P. Ry., at Portage la Prairie, Man., 0.99 of a mile; Canadian Pacific Ry., Tramp Jet. to Nelson, B.C., 5.42 miles; Province of British Columbia, New Westminster Bridge, 1.48 miles.

Successful Transportation of Canadian Overseas Expeditionary Forces.

The railway and steamship companies have performed a remarkable service in sending overseas over 100,000 of the Canadian forces without the loss of a single man, and practically without a single hitch in regard to commissariat arrangements for troops en route. Out of all the men who have gone overseas there was only one casualty recorded during transport, and that happened early in the war, when a Canadian soldier was killed by jumping off one of the troop trains.

Up to Nov. 26, the total number of Canadian troops who had actually been transported from Canada was 104,600, of whom 102,245 had been landed in England, while 988 had been sent to Bermuda and 196 to St. Lucia. In addition, nearly 800 nurses have been taken over, also about 20,000 horses. Counting the troops now en route, it is estimated that there are now on active overseas service over 110,000 officers and men from Canada.

The Ontario License Board will, it is said take steps to stop the sale of intoxicating liquor on railway trains in the province.

During the year the Vancouver, Victoria and Eastern Ry.'s line from Coalmount to Brookmere (formerly Otter Summit), 25.39 miles, was completed, and was opened for traffic, June 1. The total addition to spurs, siding and yard mileage was 21.55 miles, of which 3.10 miles represented additions to lines owned by controlled companies in Canada. About half a mile of new right of way fence was built in Canada, and 250 lin. ft. of new crib work were built on the line between Blaine, Wash., and White Rock, B. C. The filling in of the False Creek tide lands at Vancouver, B.C., which was discontinued for a time, has been resumed.

The gross operating revenues were \$67,162,857.66 against \$76,854,937.50 for the year ended June 30, 1914. The operating

Tie Renewals and Distributions.

By M. Henry, Supervisor, C. & E. I. Rd.

The question of tie renewals for the coming season will soon come up. Ties will begin to arrive and their proper distribution is of the greatest importance. In order to properly distribute the ties arriving for use in the next season's renewals a knowledge of the actual condition of the ties now in the tracks is necessary. The only right way to get this information is for the roadmaster, or some other responsible person, and the section foreman to go over all tracks carefully and spot all ties that should be renewed next season. Very often, even when this method is followed, sufficient information is not obtained for distributing ties, as only a record of the total number per section or per mile is made up, which does not show just where the ties are needed. As most roads now number the telegraph poles between each mile post, marking every fifth pole, records can be made and kept for reference, so that ties, when distributed according to the record, will not have to be rehandled and trucked, in fact worn out before they are finally distributed where they should have been when thrown off the cars. The labor that would be required to shift ties to points more or less distant can be used in applying the ties which will mean a considerable saving in time and the cost of the renewals.

Cross Tie Programme for subdivision no. for 1915.
Section no. Foreman.....

T. P. to T. P.	No ties spotted main track	Ties on hand	Ties needed to complete renewals.	Ties applied.	Remarks.
.....
.....

Chart for Tie Conditions, etc.

The above merely shows the heading of the columns. Any number of ruled lines can be put in below according to the size of chart used.

I am showing herewith a blank chart that I have used several years, on which a complete record of the tie conditions and the progress of the tie distribution and renewals for each section is made up when ties for renewal are spotted. This is filled in by the track foreman in duplicate. He retains a copy and sends the original to me. From the information shown on the chart it is not a difficult matter to arrive at the actual tie conditions of each section or what is necessary to take care of the tracks for the following season. Column 1 shows locations on main track and the name of each siding. Column 2 shows the number of bad ties between each numbered telegraph pole in main track and in each siding. Column 3 shows the number of ties now on hand, if any, that can be used for renewals. Column 4 shows the number of ties yet needed at that point to complete renewals. Column 5 is a record of the progress of the track foreman which can be kept from his reports. Column 6 can be used to explain why more ties have been applied than are spotted, as often is necessary on account of derailment or other unforeseen reason. The figures at the bottom of the chart give the roadmaster all of the information that he requires for his tie requisitions and for the distribution of his allowance over his subdivision.

The charts for each section can be arranged in section order and bound, to be used for reference all through the season. Often an old foreman will leave the service, or be off duty at the time when ties are arriving, leaving the work of distributing the ties to a foreman who is entirely unfamiliar with the conditions. The chart, if properly

filled out, and put in his hands, will enable him to make the distribution as well as the regular foreman who is away. There will be no excuse for an oversupply at one point or too little at others.

Records kept in this way for several consecutive years are most interesting and instructive as comparisons of the records of the years previous will indicate clearly what progress is being made in bettering the track conditions as far as ties, at least, are concerned. Also whether or not the percentage of tie renewals at certain points is decreasing and gradual improvement is being made. This method will increase the efficiency of the track foreman. It will ensure economy and the track supervisor will know that the ties he is allowed will be distributed and used in such a way that all tracks in his charge will be left safe at all times.—Maintenance of Way Bulletin.

Birthdays of Transportation Men in January.

Many happy returns of the day to:—

J. Abrams, Wharf Freight Agent, C.P.R., Vancouver, B.C., born at Manchester, Eng., Jan. 24, 1870.

W. U. Appleton, General Master Mechanic.

continental Ry., Transcona, Man., born at Forres, Scotland, Jan. 1884.

Gordon Grant, Chief Engineer, National Transcontinental Ry., Ottawa, born at Dufftown, Scotland, Jan. 2, 1861.

G. F. Hichborn, formerly Agent, Great Eastern Fast Freight Line, New York, born at Boston, Mass., Jan. 13, 1875.

D. W. Houston, Superintendent, Regina Municipal Ry., Regina, Sask., born at Bathurst, N.B., Jan. 3, 1879.

Carl Howe, Manager, New York Central Fast Freight Lines, Chicago, Ill., born at Berrien Springs, Mich., Jan. 11, 1870.

H. J. Humphrey, acting Superintendent Car Service, Eastern Lines, C.P.R., Montreal, born at Berrys Mills, N.B., Jan. 26, 1879.

W. C. Hunter, ex-Manager, New Brunswick Coal and Ry. Co., Moncton, N.B., born at St. John, N.B., Jan. 4, 1865.

H. G. Kelley, Vice President, G.T.R., Montreal, born at Philadelphia, Pa., Jan. 12, 1858.

John Macrae, Locomotive Foreman, C.P.R., North Bend, B.C., born at Springburn, Glasgow, Scotland, Jan. 30, 1879.

J. J. Nelligan, Division Freight Agent, Canada Steamship Lines, Ltd., Montreal, born at Hamilton, Ont., Jan. 20, 1876.

G. Pepall, Assistant Foreign Freight Agent, G.T.R., and representing National Despatch-Great Eastern Line, Toronto, born at High Wycombe, Bucks, Eng., Jan. 15, 1849.

W. Phillips, European Railway and Steamship Manager, Canadian Northern Ry., London, Eng., born at Toronto, Jan. 31, 1870.

W. Pratt, General Superintendent, Sleeping and Dining Cars and Hotels, Canadian Northern Ry., Winnipeg, born at Sibbertoft, Northamptonshire, Eng., Jan. 18, 1870.

John Pullen, President, Canadian Express Co., Montreal, born at Shepton Mallet, Eng., Jan. 23, 1863.

L. J. Rouleau, Travelling Freight Agent, G.T.R., and Agent, National Despatch-Great Eastern Line, Montreal, born there, Jan. 6, 1879.

B. G. F. Rutley, ticket agent, Canadian Northern Ry., and Grand Trunk Pacific Ry., Fort Garry Union Station, Winnipeg, born at Chatham, Ont., Jan. 25, 1879.

J. G. Sullivan, M.Can.Soc.C.E., Chief Engineer, C.P.R. Western Lines, Winnipeg, born at Bushnell's Basin, N.Y., Jan. 11, 1863.

Ross Thompson, ex-Chief Engineer and Managing Director, St. John and Quebec Ry., Fredericton, N.B., born at Newry, Ireland, Jan. 1, 1865.

O. C. Walker, Inspector, Refrigerator Service, C.P.R. Western Lines, Winnipeg, born at Newport, Mon., Eng., Jan. 31, 1877.

T. H. White, Chief Engineer, Canadian Northern Pacific Ry., Vancouver, born at St. Thomas, Ont., Jan. 27, 1848.

A. Wilcox, General Superintendent, Central Division, Canadian Northern Ry., Winnipeg, born at Kincardine, Ont., Jan. 2, 1865.

Canadian Railway Club.—A. D. Thornton, Technical Superintendent, Canadian Consolidated Rubber Co., Montreal read a paper before the Club recently, on "Rubber as related to the war," in which he explained Great Britain's action in regard to crude rubber at the outbreak of the war and also of the uses of rubber in the war.

Some interesting facts are being circulated regarding the repairs to the Pacific cable, which was severed by the German raiding vessel Nurnberg, since dealt with, in the early stages of the war. After attacking the cable station at Fanning Island, the Nurnberg severed the cable near shore, and towed the end into deep water, where it was dropped. To locate the end, a glass bottomed vessel was designed, and one of the operators dived in 40 ft. of water, where sharks are frequent, and attached a line and the cable was hauled aboard.

Intercolonial Ry., Moncton, N.B., born there, Jan. 29, 1878.

R. Armstrong, Superintendent, District 4, Manitoba Division, C.P.R., Souris, born at Kingston, Ont., Jan. 27, 1865.

F. X. Belanger, General Freight and Passenger Agent, Temiscouata Ry., Riviere du Loup, Que., born at Chlorydormes, Que., Jan. 20, 1876.

R. H. Bell, General Agent, Canadian Northern Ry., Chicago, Ill., born at Toronto, Jan. 13, 1865.

E. Bower, Travelling Passenger Agent, Canadian Northern Ry., Calgary, Alta., born at Nottingham, Eng., Jan. 17, 1889.

G. McL. Brown, European Manager, C.P.R., London, Eng., born at Hamilton, Ont., Jan. 20, 1866.

R. F. Chapman, Chief Dispatcher, District 1, Saskatchewan Division, C.P.R., Regina, born at Coal Branch, N.B., Jan. 21, 1874.

W. A. Cowan, Division Engineer, National Transcontinental Ry., Cochrane, Ont., born at Galt, Ont., Jan. 22, 1877.

J. E. Dalrymple, Vice President, G.T.R., G.T.P.R., and Central Vermont Ry., Montreal, born there Jan. 1, 1869.

A. Davidson, General Agent, Grand Trunk Pacific Ry., Prince Rupert, B.C., born at St. Henri, Montreal, Jan. 29, 1885.

G. J. Desbarats, C.M.G., Deputy Minister of Naval Service, Ottawa, Ont., born at Quebec, Que., Jan. 27, 1861.

J. E. Everell, Superintendent, Montmorency Division, Quebec Ry., Light and Power Co., Quebec, born at Cap Rouge, Que., Jan. 1, 1863.

J. Gordon, General Electrical Foreman, Motive Power Department, National Trans-

January, 1916.]

Pacific Great Eastern Railway Company's Annual Meeting.

At the fourth annual meeting in Vancouver, Oct. 26, the following report was presented:—Of our securities guaranteed by the Province of British Columbia there were outstanding at June 30, 1914, \$13,991,475.00; on July 17, 1914, £50,000 (or \$243,330.00) of the company's 1st mortgage 4½% guaranteed debenture stock was sold at 96½, making the total securities disposed of \$14,234,605. Since July 17, 1914, the date of the last sale of the company's securities, there has been no market, consequent upon the war. The total securities guaranteed applying on the main line amount to \$16,800,000 secured by a first charge on the line, and \$3,360,000 secured by a second charge, making a total of \$20,160,000.00, of which, as above stated, \$14,234,605 have been issued. The balance of the above securities, \$5,925,195.00, has been pledged to secure a loan of \$4,800,000 obtained by the company in pursuance of the authority granted the directors at the last annual meeting. Applying on the Peace River extension, securities to the extent of \$11,550,000 have been guaranteed by the B.C. Government, but on account of the adverse conditions no disposition could be made of them; and it has been impossible to start work on the grading of this extension. At the next session of the Legislature, your directors propose to apply for an extension of the time in which to commence and carry on that work.

Satisfactory progress, notwithstanding present financial conditions, has been made with the work of construction on the main line. The Chief Engineer reports that the grading of the entire line is finished with the exception of the Howe Sound section between Horseshoe Bay and Squamish, about 30 miles, and about 30 miles of comparatively light work near Horse Lake. During the past year, track has been extended north of Squamish to some miles beyond Lillooet, and the company has been authorized by the Minister of Railways to carry traffic over it between the above named towns. The contractor is operating this train service under his agreement with the company. He is also maintaining train service on the North Vancouver-Horseshoe Bay section to comply with our agreements with the municipality of West Vancouver and various property owners there. Track-laying is still in progress, but the work is proceeding slowly of necessity on account of our having to haul to the site of the structures by rail material for the construction of the bridges, the cost of hauling such a large amount of material by teams, in order to have the structures completed by the time the track reached their sites, being absolutely prohibitive. The track between Squamish and Lillooet has been ballasted. A six-stall locomotive house has been erected at Squamish, and our terminal yard at that place laid out.

Those studying the situation appear unanimously to have reached the conclusion that on the cessation of European hostilities Canada will benefit largely by a great influx of high-class British emigrants. Many of these, on account of the climatic and other advantages that this province affords, will be attracted to British Columbia. As no other line of railway serves the central portion of the province, the importance to the country of the completion of our line is manifest, if British Columbia is to be in a position to take advantage of this expected immigration. The early completion of the railway will continue to be the aim of those charged with that responsibility.

The following comprise the board for the current year:—President, J. W. Stewart;

Vice President and General Counsel, D'Arcy Tate, K.C.; Vice President, T. Foley; Land Commissioner, F. Wilson; other director, E. F. White. The other officers are:—Secretary-Treasurer, R. D. Thomas; Chief Engineer, J. Callaghan; General Manager, A. H. Sperry.

The Pacific Great Eastern Development Co.'s annual meeting was held on the same day. The directors elected are:—J. W. Stewart, T. Foley, P. Welch, D'Arcy Tate, K.C. R. D. Thomas is Secretary, and E. F. White, Treasurer.

Difficulties in the Way of Electrification of Chicago Terminals.

Electrification of railway terminals in Chicago is impracticable for financial reasons, according to advance statements regarding the comprehensive work of the Chicago Terminal Electrification Commission on electrification and smoke abatement. The cost is estimated at \$290,000,000 for 3,356 miles of track which would have to be included in a complete system. This is for the terminal system as a whole, with electric service extended to points 15 to 20 miles distant. Of this amount \$188,000,000 is said to be the direct cost and \$102,000,000 the cost of changes and betterments in connection with the work. The committee has not considered the practicability of electrification for individual roads. As far as the smoke problem is concerned, railway locomotives are said to be a minor factor, and a permanent commission is proposed to study this problem. One conclusion reached is that the complete elimination of steam locomotives is not necessary as a means of smoke abatement. A second finding is that no existing contact system is well adapted to some of the Chicago trackage. A third point is that the longer electrification is delayed the more the technical difficulties will be reduced through developments of the art.

Release Form for Beer Shipments West of Lake Superior.

Sir Henry L. Drayton, Chief Commissioner, Board of Railway Commissioners, gave the following judgment, Nov. 19, which was concurred in by Commissioner McLean: A complaint was made by the Fernie-Fort Steele Brewing Co., Ltd., of Fernie, B.C., as to the heated car service supplied by the C.P.R. It appearing in consideration of that case that, although the circulars issued by the railway governing shipments west of Lake Superior of perishable freight liable to be easily damaged by frost, required the movements to be made at the owner's risk, the railway in that case affected and which had received a revenue of \$1,171.89, nevertheless paid out on claims for damages by frost no less than \$2,134.52. Taking 67% as the operating ratio then applying, although that ratio as applied to the l.c.l. movements will be low, it cost the railway, in the first instance, \$784.06 to earn the freight charges of \$1,171.89, resulting in an apparent profit of \$386.72. In view of the amount actually paid for damage claims the railway, after having performed the service, was as a result some \$1,747 out of pocket. For reasons set out in a considered judgment, relief was given the railway.

Based on this judgment, the railway has issued a general form of release, which in terms applies to the movement of all perishable freight, such as beer, fruit, and vegetables during the cold periods, west of Port Arthur. Clause 2 of the original order, however, limited the effect of the judgment as follows: "That this order ap-

ply only to shipments of the Fernie-Fort Steele Brewing Co., Ltd., and the Elk Valley Brewing Co., Ltd., and any others who may apply for the same service on the lines of the C.P.R. west of Port Arthur, during the winter of 1915-1916."

Complaints have been made by different boards of trade on behalf of shippers. The Board is not in a position to determine, from the record as developed merely on complaints of the Fernie-Fort Steele and Elk Valley Brewing Companies, whether or not the order which was intended to deal with that specific case, resulting as it did in a specific hardship to the railway company which could not be justified, should be extended in like manner to other perishable commodities. I am of the opinion that order 23997, July 22, 1915, should be amended, so as to confine the portion of the release form there considered solely to shipments west of Lake Superior of beer in less than carload quantities, in cold or stormy weather.

Tree Windbreaks on the Canadian Pacific Railway.

Canadian Railway and Marine World for Sept., 1913, contained information as to trees to replace portable snow fences being tried on a large scale on the C.P.R. lines between Winnipeg and Calgary. The Superintendent of the Forestry Branch of the Department of Natural Resources has given us the following additional information:

"The work was started in 1908 and it took two years to get the ground ready for planting. The prairie sod had to be broken the first year, then backset and summer fallowed in order to accumulate sufficient moisture for tree growth. The conditions affecting tree growth east and west of Moose Jaw were found to be absolutely dissimilar. East of Moose Jaw trees planted three years can be left without any further maintenance; west of Moose Jaw it is necessary to cultivate each year in order to keep the trees free from weeds, which would deprive them of needed moisture. The district west of Moose Jaw is in what is known as 'The Dry Belt.' In territory similar to this in the United States one of the railways tried watering the trees, but that is a mistake; cultivation is all that is needed.

"The cost of the portable panel snow fence anywhere in Western Canada, Minnesota, Dakota, or other western states is from \$2.39 to \$2.51 per 16 ft. panel. The depreciation and annual maintenance per 16 ft. panel is 47c. The cost of 16 feet of tree snow fence, including three years maintenance, is \$1.95. The three years cost of maintenance is necessary before the fence may be said to be established; west of Moose Jaw it may take five years.

"The tree snow fence has been remarked upon by hundreds of tourists, and has helped very considerably in demonstrating to intending settlers the possibilities of proper cultivation in the dry areas. The tree snow fence also is just as good, if not better, than the panel fencing.

Australian Transcontinental Railway.—A progress report to the Australian Government shows that track has been laid for 660 miles and grading completed for 662 miles, on the line from Kalgoorlie to Port Augusta. The telegraph line has been erected for 656 miles. Progress has been somewhat slower on the western end owing to bad weather. On that end 1,190 men are employed, and 1,200 on the south. The contract for the supply of portable telephones and contact rods has been awarded to the Western Electric Co.

Steam Railway Freight Statistics.

The aggregate tonnage of freight carried by Canadian railways during the year ended June 30, 1914, was 101,594,753 tons, against 106,992,710 tons in 1913-14, and 89,444,331 in 1912-13. Of the total tonnage carried during the last statistical year 57,873,657 tons originated on home lines, 19,904,087 were received from other lines in Canada, and 23,553,833 were received from U. S. lines.

Name of Railway.	Originating on own line.	Received from other lines in Canada.	Received from U.S. lines.
	Tons.	Tons.	Tons.
Algoma Central and Hudson Bay	336,478	32,610	
Alcan. Eastern	716,986	14,942	
Atlantic, Quebec and Western	6,780	27,345	
Bay of Quinte	122,385	122,435	
Bedford and Nelson	868		450
Brandon, Sask. and Hudson Bay	44,339	340	17,692
British Yukon	43,307		
Brookville, Westport and N.W.	11,979	15,548	
Canada and Gulf Terminal	22,460	3,587	
Canada Southern	888,438	412,074	6,240,303
Canadian Northern	5,560,634	684,570	292,212
Canadian Northern Quebec	698,214	465,914	
Canadian Pacific	745,758	370,254	
Cape Breton	20,296,434	5,690,385	1,814,398
Caraguet	3,468	2,911	
Carillon and Grenville	20,503	12,398	
Central Ontario			
Crow's Nest Southern	245,342	100,085	
Cumberland Ry. and Coal Co.	210,555	42,523	12,394
Detroit River Tunnel	341,013	18,333	
Dominion Atlantic			
Eastern British Columbia	266,261	85,398	5,170
Elgin and Havelock	118,957	2,743	
Esquimalt and Nanaimo	10,323	2,061	
Essex Terminal	374,737	60,348	
Fredericton and Grand Lake Coal and Ry. Co.	62,036	114,357	
Grand Trunk	9,062,258	2,914,508	8,050,689
G.T.R. (Canada Atlantic)	1,022,256	834,811	60,506
Grand Trunk Pacific	1,611,757	150,004	31,453
Halifax and South Western	223,813	42,609	800
Hereford	127,357	132,893	7,953
Intercolonial	3,477,640	1,604,844	
International Ry. of N. B.	83,524	5,340	
Inverness Ry. and Coal Co.	273,285	15,185	

Irondale, Bancroft and Ottawa	24,835	6,243	
Kent Northern	2,806	4,384	
Kettle Valley	2,296	1,748	23,728
Klondyke Mines	42,786		
London and Port Stanley	26,128	23,091	588,650
Lotbiniere and Megantic	39,459	2,350	152
Maine Central (Princeton branch)			183,443
Manitoba Great Northern	36,167	14,047	34,791
Maritime Coal, Ry. and Power Co.	204,007	10,561	
Massachusetts Valley	129,176	320,596	77,719
Midland Ry. of Manitoba	5,176	4,838	173,097
Moncton and Buctouche	19,726	2,490	
Montreal and Atlantic	104,492	767,640	331,434
Montreal and Province Line	26,537	73,409	8,532
Montreal and Vermont Jct.	16,720	307,282	110,482
Morrissey, Fernie and Michel	806,000	27,086	150
Napierville Jct.	16,733	80,220	327,233
National Transcontinental	36,807	26,166	
Nelson and Fort Sheppard	16,042	416	9,881
New Brunswick and P.E.I.	42,390	10,963	
New Brunswick Coal and Ry. Co.	52,927	5,580	
New Westminster Southern	25,261	26,031	
Northern New Brunswick and Seaboard	69,574	1,669	
North Shore	1,580		
Ottawa and New York	85,519	104,312	207,064
Pere Marquette Rd.	63,992	191,050	1,885,281
Prince Edward Island	110,082	6,344	
Quebec and Lake St. John	334,685	208,340	
Quebec Central	896,238	189,967	
Quebec, Montreal and Southern	117,998	535,087	32,305
Quebec Oriental	20,603	47,434	
Quebec Ry., Light and Power Co.	217,821	7,224	
Red Mountain	1,046	20	30,019
Roberval and Saguenay	38,651	16,381	
Rutland and Noyan	1,651	208,065	13,140
Salisbury and Albert	32,466	7,640	
Schomberg and Aurora	6,029	9,323	
Stanhope, Shefford and Chambly	22,137	326,966	112,446
St. Clair Tunnel			
St. Lawrence and Adirondack	37,891	195,618	712,536
St. Martins	7,567	3,710	
Sydney and Louisburg	4,756,769	138,800	
Temiscouata	187,613	26,068	
Timiskaming and N. Ontario	519,394	162,762	77,796
Thousand Islands	15,088	23,701	
Toronto, Hamilton and Buffalo	278,378	1,913,907	
Vancouver, Victoria and Eastern	977,170	13,974	324,927
Victoria and Sidney	12,341	16,296	
Victoria Terminal Ry. and Ferry Co.	6,761	20,150	
Wabash Rd. in Canada	32,022	17,141	1,753,323
Wellington Colliery Co.	307,214	4,948	
York and Carleton	8,618	1,586	
	57,873,657	19,904,087	23,553,833

Orders by the Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the orders were drawn.

24441. Nov. 16.—Authorizing C.P.R. to use bridge 3.5, Outlook Subdivision, Sask.

24442. Nov. 16.—Authorizing C.P.R. and St. John Ry. to operate trains and cars over crossing on Main St., St. John, N.B., without first stopping; speed not to exceed 10 miles an hour.

24443. Nov. 16.—Approving Edmonton, Dunvegan & British Columbia Ry. location from mileage 0 to 25.51, through tps. 73 and 75, r. 5 and 6, w.6.m., Alta.

24444. Nov. 17.—Ordering G.T.R. to build special drain for subway under its tracks at Ste. Anne de Bellevue, Que., from subway northerly along Pacific St., into river; 20% to be paid out of railway grade crossing fund; remainder, 15% each by Ste. Anne de Bellevue and Senneville, Que., and 35% each by G.T.R. and C.P.R.

24445. Nov. 13.—Relieving G.T.R. from providing further protection at crossing of Carling Ave., Ottawa.

24446. Nov. 15.—Authorizing Edmonton, Dunvegan & British Columbia Ry. to build its Grande Prairie Branch across 22 highways, mileage 0 to 25.51.

24447. Nov. 15.—Authorizing C.P.R. to build its Chippen ballast pit spur across road allowance along east boundary n.e. ¼ Sec. 13-40-21, First Ave., and road allowance on south boundary of s.e. ¼ Sec. 13-40-21, w.3.m., Sask.

24448. Nov. 17.—Relieving Vancouver, Victoria & Eastern Ry. and Navigation Co. (G.N.R.) from lighting main line switches from sunset to sunrise, on its lines between Port Kells and Hazlemere, not including Port Kells, and between Guichon and Huntington, B.C., both included, March 1 to Oct. 14, inclusive; providing lamp equipment be not removed from controlling stations or section foreman's headquarters; present schedule of trains to remain in effect; no extra trains to be run over said portion of line from sunset to sunrise.

24449. Nov. 17.—Authorizing Alberta Public Works Department to build highway crossing over C.P.R. in n.w. ¼ 4-52-24, w.4.m.

24450. Nov. 17.—Authorizing G.T.R. to rebuild bridge 61, at mileage 171, District 31, Ottawa Division, across C.P.R. siding; applicant's

siding and roadway near Arnprior, Ont.; fence to be erected between C.P.R. tracks and roadway, and rescinding order 17475, Sept. 11, 1912.

24451. Nov. 17.—Authorizing Canadian Northern Ry. to divert road allowance between Sec. 6, Tp. 22, and Secs. 31 and 32-21-15, w.p.m., Man., and to cross highways at right angles.

24452. Nov. 17.—Authorizing Alberta Public Works Department to build highway over Grand Trunk Pacific Ry. in s.e. ¼ 4-42-21, w.4.m., cost of construction and maintenance to be paid by G.T.P.R., and rescinding order 13218, Mar. 14, 1911, in so far as it authorizes crossing of road allowance east of Sec. 4.

24453. Nov. 16.—Ordering C.P.R. to partition off portion box car, now used as station building at Vidora, Sask., for waiting room of about 8 by 18 ft. and to supply same with seats for accommodation of passengers, leaving other portion for agent's office and perishable goods and express; also to fit up dismantled box car body, so that freight may be housed properly; to build steps to approach to waiting room and platform; level platform off with cinders; build cinder walk across right of way to main street of village; work to be completed by Dec. 1, station agent not to be removed without Board first being notified, giving reasons and statement of earnings.

24454. Nov. 17.—Relieving Canadian Northern Ry. from providing further protection at crossing of highway about 1½ miles from Shawinigan Falls, Que.

24455. Nov. 18.—Authorizing Saskatchewan Board Highway Commissioners to build extension to Dufferin St. across C.P.R. in Ked-dleston, Sask.; original road allowance to be closed.

24456 to 24458. Nov. 18.—Approving Bell Telephone Co.'s agreements with Yarmouth Rural Telephone Co., Nov. 9; and with Tay Tp., Ont., Nov. 5, and Bolton Telephone Co., Nov. 4.

24459. Nov. 20.—Amending order 23392, Mar. 4, re release of responsibility on beer, etc., shipments west of Lake Superior.

24460. Nov. 19.—Ordering Canadian Northern Ry. to regrade north approach to bridge on public road between Sec. 9 and 10-6-23, w.p.m., to conform with Board's regulations, work to be done in spring, as soon as frost is sufficiently out of ground to permit; when bridge is renewed, it is to be placed on a line with road allowance and widened to 20 ft.

24461. Nov. 19.—Approving proposed change in location of G.T.R. siding for Frost Wire Fence Co., Hamilton, Ont.

24462. Nov. 19.—Ordering G.T.R. to sell tickets for Canadian Northern Ry. at ticket office operated by G.T.R. and C.P.R. jointly on train floor in Union Station, Toronto, and to exchange Canadian Northern tickets for orders, the Canadian Northern to pay one third of the cost of operating the ticket office, including salaries and actual disbursements, but no rental charges.

24463. Nov. 19.—Authorizing Canadian Northern Ry. to cross road allowance between Secs. 8 and 17-22-29, and cross and divert highway between Secs. 17 and 18-22-29, w.4.m., Alta., after which it may close road between Secs. 17 and 18 with its right of way fences; and rescinding order 17308, Aug. 26, 1912, in so far as it authorizes crossing and diversion.

24464. Nov. 22.—Authorizing Canadian Northern Ry. to build three tracks across Coteau St., Moose Jaw, Sask., and carry highway across track overhead; and rescinding order 20259, Sept. 4, 1913.

24465. Nov. 22.—Authorizing C.P.R. to open for traffic diversion tunnel at mileage 40.4, Boundary Subdivision, B.C.

24466. Nov. 22.—Amending order 24414, Nov. 8, re connection between Regina Municipal Ry. and C.P.R. at Arcola Ave., Regina, Sask.

24467. Nov. 22.—Authorizing C.P.R. to build spur for German, Clancey & Grindley, Ltd., Calgary, Alta.

24468. Nov. 22.—Authorizing Grand Trunk Pacific Ry. to build farm crossing over its tracks in s.e. ¼ Sec. 17-36-5, w.3.m., Sask.; cost and maintenance to be paid by Saskatchewan City Golf Club.

24469. Nov. 23.—Authorizing Toronto, Hamilton & Buffalo Ry. to build spur for Dominion Steel Foundry Co., Hamilton, Ont., and authorizing clearances.

24470. Nov. 19.—Authorizing Canadian Northern Ry. to carry traffic, temporarily, pending completion of ballasting, over its line from Yorkton, Sask., to end of track, 16 miles, speed of trains limited to 15 miles an hour.

24471. Nov. 23.—Approving turnout of Edmonton, Dunvegan and British Columbia Ry. Grande Prairie Branch at point shown on plan, Nov. 15, filed with the Board.

24472. Nov. 23.—Authorizing Canadian Northern Ry. to build siding extension across public road between Lot 11, Con. B, and Lot 11, Con. A, Mara Tp., Ont.

24473. Nov. 23.—Authorizing Canadian Northern Ontario Ry. to open for traffic its line from Rideau Jct. to Pembroke.

24474. Nov. 23.—Extending to Dec. 31 time within which Toronto Suburban Ry. may cross C.P.R. temporarily, for construction purposes only, near Guelph, Ont., between 6.30 a.m. and 6.30 p.m.

24475. Nov. 19.—Authorizing Canadian Northern Ry. to cross highway between Sec. 1, Tp. 21, R. 29, and Sec. 36-20-29; cross and divert highway between Sec. 1-21-29, and Sec. 6-21-28, w.4.m. Alta.; and rescinding order 17764, Oct. 16, 1912, in so far as it authorizes crossing and diversion.

24476. Nov. 22.—Approving Bell Telephone Co. agreement with Goodwood Rural Telephone Co., Nov. 11.

24477. Nov. 25.—Relieving Vancouver, Victoria & Eastern Ry. and Navigation Co. (G.N.R.) from erecting fences, gates and cattle guards on its Coalmont-Otter line, B.C., between mileage 215.37 and 237.25.

24478. Nov. 25.—Authorizing G.T.R. to build two spurs for Gull River Lumber Co., near Co-boconk Station, Ont.

24479. Nov. 26.—Authorizing C.P.R. to build siding for W. Rennie & Co., Chatham, Ont.

24480. Nov. 26.—Authorizing courtenay Electric Light, Heat & Power Co. to erect wires across Esquimalt & Nanaimo Ry. at Lake Trail Road, near Courtenay, B.C.

24481, 24482. Nov. 25.—Relieving Kettle Valley Ry. from maintaining fences, gates and cattle guards along portions of its right of way, between Midway and Merritt; mileage 6.97 to 18.85, Penticton to Princeton; and mileage 2.95 to 133.41, Midway to Penticton, B.C.

24483. Nov. 23.—Authorizing C.P.R. to build spur for Morin, Gareau & Beaudoin at mileage 15.1, St. Lin Subdivision.

24484. Nov. 25.—Approving clearances of umbrella roof to be built at C.P.R. North Toronto station.

24485. Nov. 25.—Substituting plan of Oct. 29, showing bridge over C.P.R. at road between Secs. 29 and 30-16-11, w.3 m., Sask., for plan B-14-38, referred to in order 24424.

24486. Nov. 24.—Relieving Grand Trunk Pacific Ry. from maintaining fences, gates and cattle guards from mileage 164 to 467, Prince Rupert East, B.C.

24487. Nov. 24.—Approving Bell Telephone Co. agreement with New Glasgow Telephone Co., Nov. 16, 1915; and rescinding order 8238, Oct. 5, 1909.

24488. Nov. 24.—Authorizing C.P.R. to charge \$1.75 a car for additional service of switching between dock and land team tracks and private sidings at Kelowna, B.C., and ordering it to file amendment to its tariff C.R.C. no. W-2027 accordingly.

24489. Nov. 27.—Rescinding order 24313, Oct. 16, and ordering that Dominion Atlantic Ry. tariffs, C.R.C. 454 and 455, become effective Dec. 10.

24490. Nov. 27.—Ordering that the Junior Judge of Carleton County be appointed sole arbitrator to determine value of land taken by Canadian Northern Ontario Ry. from H. Ray, and damage, if any, according to Railway Act, to Henry Ray's remaining property, due to construction and operation of railway thereon, with suitable farm crossing underneath tracks; each party to pay his own costs of arbitration and half costs of arbitrator.

24491-24493. Nov. 27.—Extending, to July 1916, time for approval of tolls of Grand Trunk Pacific Telegraph Co., C.P.R. Telegraphs and White Pass and Yukon Ry. Telegraphs.

24494. Nov. 25.—Authorizing City of Hull, Que., to build highway over C.P.R. at Montclair Ave.; trees to be removed so that there shall be a clear view of approaching trains in either direction from any point on highway within 100 ft., and to any point on railway within half a mile, of crossing. Crossing authorized under order 5110, July 29, 1908, to be closed.

24495. Nov. 30.—Relieving Canadian Northern Alberta Ry. from speed limitation of 25 miles an hour from St. Albert to Peace River Jct., Alta. 2 1/2 miles.

24496. Nov. 29.—Authorizing C.P.R. to build highway diversion in s.e. 1/4 Sec. 25-17-3, and s.w. 1/4 30-17-2, w. 3 m.; and to build main track at mileage 35.34, Swift Current Subdivision, and one other track, at grade across same, also to close portions of road allowance within its right of way.

24497. Nov. 29.—Approving plans and specifications of Orford Tp., Ont., of Gosnell drain under Michigan Central and Pere Marquette Rds.

24498. Nov. 29.—Authorizing Canadian Northern Ry. to build across highways between Secs. 3-4, and Secs. 4-5-35-7, w. 2 m., Sask.

24499. Nov. 29.—Extending, to Jan. 1, 1916, time within which gates be installed by G.T.R. at Barton St., Barton Tp., Ont.

24500. Nov. 29.—Relieving Grand Trunk Pacific Branch Lines Co. from maintaining switch lights on certain branch lines, as long as present schedule continues, between sunset and sunrise; lamp equipment to be kept available at controlling station or sectionmen's headquarters.

24501. Nov. 29.—Authorizing G.T.R. to build new station at Mimico, Ont., to be completed by Dec. 31, and rescinding order 24114, Aug. 24.

24502. Nov. 30.—Extending, for 30 days from date, time within which London and Port Stan-

ley Ry. shall install bell at Warren St., first crossing north of Port Stanley, Ont.

24503. Nov. 30.—Authorizing Hamilton St. Ry. to operate over crossing of Toronto, Hamilton and Buffalo Ry., used for serving Grasel Chemical Co., and National Steel Car Co., at its crossing of Burlington (Gilkinson) St., pending installation of half interlocking plant.

24504. Nov. 30.—Ordering C.P.R. to remove gates and to erect standard crossing signboards, and otherwise make crossing of Second St. at Golden, B.C., conform to standard regulations.

24505. Nov. 30.—Authorizing Town of Sandwich, Ont., to build Wright Place across Essex Terminal Ry.; crossing at Chippawa St. to be closed.

24506. Nov. 30.—Authorizing Canadian Northern Ontario Ry. to build spur for Hocken Lumber Co., mileage 170.7, Lot 6, Con. 9, Burpee Tp.

24507, 24508. Nov. 29.—Approving Bell Telephone Co. agreements with Ernesttown Rural Telephone Co. and Ste. Sabine Rural Telephone Co., Nov. 18.

24509. Dec. 2.—Substituting Board of Grain Commissioners of Canada's plan B, showing branch line to connect Grand Trunk Pacific Ry. with elevator at Moose Jaw, Sask., for plan approved under order 24080.

24510. Nov. 30.—Extending, to July 1, 1916, time for approval of Great North Western Telegraph Co.'s tolls.

24511. Dec. 1.—Authorizing Canadian Northern Ry. to build highway crossing over its tracks at St. Joseph St., La Tuque, Que., in lieu of two adjacent crossings to be closed, cost and maintenance to be paid by La Tuque.

24512. Dec. 1.—Authorizing Canadian Northern Saskatchewan Ry. to cross and divert road between Sec. 35-25 and Sec. 2-26-1, w. 2 m., diversion to be graded.

24513. Nov. 30.—Authorizing R. H. Johnson, Omamee, Ont., to lay drain across G.T.R. property and tracks.

24514. Nov. 22.—Relieving Ottawa and New York Ry. from providing further protection at Landry's Crossing, near milepost 29, near Cambridge station, Ont.

24515. Dec. 3.—Ordering that gates at crossing of 7th Line at Oakville, Ont., be operated by watchmen between 7 p.m. and 7 a.m., daily; wages to be paid, one third each, by Oakville, G.T.R., and Trafalgar Tp.

24516. Dec. 3.—Ordering G.T.R. to install certain lights at Lorne Park station, Ont.

24517. Dec. 1.—Authorizing C.P.R. to build spur for Dominion Cartridge Co. at mileage 1.9 on Staynerville Branch.

24518. Dec. 1.—Authorizing C.P.R. to build two sidings for British Pacific Engineering and Construction Co. in British Columbia.

24519. Dec. 1.—Authorizing C.P.R. to build extension to siding for F. Davis, at mileage 14.5, St. Gabriel Subdivision.

24520. Dec. 3.—Authorizing Esquimalt and Nanaimo Ry. to build highway over its tracks near Coombs station, B.C.; cost and maintenance to be paid by British Columbia Government.

24521, 24522. Dec. 3.—Relieving C.P.R. from providing further protection at first crossing east of Osago station, and at crossing 1/2 mile east of Sintaluta station, Sask.

24523. Dec. 3.—Authorizing C.P.R. to build siding for R. G. Dryden, West Toronto, Ont.

24524. Dec. 3.—Authorizing C.P.R. to build extension to siding for Rocsand Co. at Erin, Ont.

24525. Dec. 3.—Ordering Canadian Northern Ontario Ry. to build farm crossing for Wm. McCoy, Richmond, Ont.

24526. Dec. 1.—Extending, to Jan. 6, 1916, time within which C.P.R. shall install gates, in the meantime crossing of Symington Ave., Toronto, to be protected by day and night watchmen, wages to be paid, half each, by C.P.R. and City of Toronto; and reserving question of C.P.R. indemnifying city against damages during said extension.

24527. Dec. 3.—Authorizing G.T.R. to rebuild bridge carrying road over main line at mileage 326.14 from Montreal, near Scarborough Jct., Ont.

24528. Dec. 4.—Relieving C.P.R. from providing further protection at highway at mileage 21.4, Sharbot Lake, Oso Tp., Ont.

24529. Dec. 4.—Amending order 24327, Oct. 18, re Canadian Northern Ontario Ry. crossing of Front St., Trenton.

24530. Dec. 1.—Authorizing C.P.R. to divert road allowance at mileage 62.4, Swift Current Subdivision.

24531. Dec. 4.—Ordering that rebuilding by C.P.R. of crossing on its Reston-Wolsley Branch, between Secs. 4 and 9-11-33, w. 1 m., conform to standard regulations and be completed by May 1, 1916.

24532. Oct. 13.—Extending, for one month from date, time within which independent telephone companies may apply for leave to appeal to Supreme Court of Canada in respect of any question of law which, in opinion of the Board, may arise in connection with general order 149, Sept. 14.

24533. Dec. 9.—Authorizing independent telephone companies to appeal to Supreme Court of Canada upon certain questions of law.

24534 to 24540. Dec. 4.—Approving Bell Telephone Co. agreements with Ste. Cecile de Whitton La Compagnie de Telephone Ste. Cecile Telephone Co., Nov. 5; Wroxeter Rural Telephone Co., Nov. 8; Norfolk County Telephone Co., No. 9; Aldborough Farmers' Telephone Association, Nov. 16; Hawthorne Hill Rural Telephone Co., Oct. 19; Conn Telephone Co., Nov. 23; and Prescott Rural Telephone Co., Nov. 9.

24541. Dec. 9.—Dismissing application of D. D. Campbell, Claims Agent, Winnipeg, on behalf of H. H. Blackburn, for adjustment of freight charges on 18 cars of ties from Bannock, Sask., to Pas, Man.

24542. Dec. 9.—Amending order 23190, Jan. 20, authorizing Nelson and Fort Sheppard Ry. (G.N.R.) to discontinue stopping its trains on flag at Benson and Ross spur, B.C., and authorizing it to stop there on flag.

24543. Dec. 11.—Ordering that 10 days prior notice of any change in a railway company's passenger train service, as provided by circular 139, be dispensed with in application of Great Northern Ry. to change time of leaving of train no. 385 out of Rossland, from 10 to 9 a.m.

24544. Dec. 9.—Authorizing Canadian Northern Ry. to build highway over the Northern Pacific and Manitoba Ry. Hope Farm spur along southerly limit of Dominion Government road allowance lying to north of Lot 191, St. Agathe Parish, Montcalm municipality; cost and maintenance to be paid by Montcalm municipality, Man.

24545. Dec. 9.—Authorizing Canadian Northern Ry. to build highway over its line along westerly limit of Lot 78, St. Norbert Parish, Fort Garry municipality; cost and maintenance to be paid by Ft. Garry municipality; work to be completed by June 1, 1916.

24546. Dec. 7.—Authorizing Bell Telephone Co. to make certain charges in case telephone installations for clergymen and religious institutions.

24547. Dec. 9.—Extending, to Feb. 1, 1916, time within which Esquimalt and Nanaimo Ry. shall install bell at Comox Road, Nanaimo, as required by order 24158, Sept. 8.

24548. Dec. 9.—Relieving Campbellford, Lake Ontario and Western Ry. (C.P.R.) and Canadian Northern Ontario Ry. from maintaining night signalmen to operate interlocking plant at crossings at mileage 1.05 and 0.55 of spur, on east side of Trent River, Trenton, Ont.; home signals and derails be set clear for, and key of tower left with C.N.O.R.

24549. Dec. 10.—Amending order 24211, Sept. 27, re Canadian Northern Ry. crossing of May St., Port Arthur, Ont.

24550. Dec. 13.—Deferring until further order the effective date of item on page four of C.P.R. Supplement 59, to C.R.C. no. W-1806, providing for minimum of 35,000 lbs. on fir, spruce, hemlock and common cedar lumber, and articles taking lumber rates, in cars under 36 ft. long.

24551. Dec. 9.—Authorizing C.P.R. to build siding for French Government Remount Depot at mileage 156.9, Quebec Subdivision, crossing Bell's Road at grade.

Elevator Track Laying Dispute at Fort William.

Winnipeg press dispatch, Dec. 21: "Canadian Pacific Ry. officials are incensed at the action taken by the Canadian Government Railways officers at Fort William on Dec. 20. The Superintendent of the Canadian Government Railways proceeded with a gang of men to lay a track across private property to a terminal elevator on the C.P.R. tracks, in the face, officials claim, of the repeated decisions of the Board of Railway Commissioners that such action would not be tolerated on the part of any railway company. The C.P.R. had the Government Railways officers arrested, and secured an injunction restraining them from further procedure. The C.P.R. people contend that storage in terminal elevators on its tracks, apart from the Government elevators, should be reserved for farmers loading grain at interior points on its lines. The C.P.R. also contends that the Canadian Government Railways has enough grain in sight to fill the Grand Trunk Pacific elevator at Fort William, and arbitrarily decided to avail itself of storage located on C.P.R. tracks, which would have the effect of preventing shippers on the C.P.R. loading for Fort William for lack of storage. C.P.R. officials state they will fight the matter to a finish."

Railway Development, Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—Track laying is reported to be in progress since Nov. 20. Work was started at mileage 135, about 27 miles north of Lac La Biche. The whole of the grading on the line is reported to have been completed with the exception of some cuts at Fort McMurray, work on which is in progress. (Dec., 1915, pg. 469.)

Canadian Pacific Ry.—The superstructure of the new station which the company is building in North Toronto for joint occupation with the Canadian Northern Ry., is rapidly taking shape. The Lyall Construction Co. has the contract. A full description of the building, with perspective and ground floor plans, was given in Canadian Railway and Marine World, Aug., 1915, pg. 292.

We are officially advised that track has been laid easterly from Foremost, Alberta, to Pakowki, 22.3 miles, on the Weyburn-Lethbridge branch.

The Calgary and Edmonton Ry. Co. is applying to the Dominion Parliament for an extension of time for building the following lines:—From its Macleod branch in tp. 19, 20 or 21, westerly to the south branch of Sheep Creek, range 4, west 5th meridian, with a branch to the north branch of Sheep Creek in ranges 2, 3 or 4 west 5th meridian, and a second branch to Trap Creek, range 6 west 5th meridian.

The junction between the east and west headings of the tunnel at Rogers Pass, was made Dec. 19, in the main tunnel. The boring of the pioneer tunnel was completed some time ago.

A contract for the reroofing of the freight shed on pier A, Vancouver, at an estimated cost of \$10,000, is expected to be let at an early date, according to a press report.

The Dominion Parliament is being asked to extend the time for the building of the following lines: From the Pheasant Hills branch in tps. 36 or 4, range 19 or 20 west 3rd meridian, northerly and westerly to Battle River, on to a junction with the Calgary and Edmonton Ry.'s Lacombe extension in tp. 36, 37 or 38, range 11, 12 or 13 west 4th meridian, 180 miles; from tp. 6, 7, 8 or 9, range 30 west 2nd meridian, westerly to a junction with the Crownsnest Pass line, 350 miles, or to a junction with the Alberta Ry. and Irrigation Co.'s line at Sterling, Alberta; from Sedgewick, on the Hardisty subdivision, southerly, to tp. 39 or 40, range 11, 12 or 13 west 4th meridian, Alberta; from Irricana easterly and south easterly to tp. 20 or 21, range 11 or 12 west 4th meridian, Alberta; from Killam, northwesterly to Strathcona, Alberta. (Dec., 1915, pg. 469.)

Central Canada Ry.—We are officially advised that track laying was completed to mileage 43, from McLennan, the junction with the Edmonton, Dunvegan and British Columbia Ry., on Nov. 26, and would be completed to Heart River, mileage 48, a few days thereafter. Track laying was then to cease, pending the erection of the bridge across Heart River, which it was expected would occupy a couple of months. A later press report stated that work on the erection of the bridge was started early in December, but we were officially advised Dec. 13 that the Board of Railway Commissioners had not agreed to the plans. (Dec., 1915, pg. 469.)

Dominion Government Ry. to Hudson Bay.—Grading is reported to be fully completed from Manitou Rapids, mileage 242 from Pas, Man., to which point a weekly train service is in operation, for a further distance of 50 miles to Kettle Rapids, Nelson River. The steel work for the superstructure of this bridge will, it is reported, be taken in overland during the winter, and assembled ready

for erection as soon as the Manitou Rapids bridge is completed.

Since the above was put in type we are officially advised that work on the line is practically closed down for the winter, with the exception of the erection of the steel superstructure for the bridge across the Nelson River at Manitou Rapids. All the material has been delivered and the Canadian Bridge Co., which has the contract, is proceeding with the erection. (Dec., 1915, pg. 469.)

Edmonton, Dunvegan and British Columbia Ry.—We are officially advised that the contract for the substructure of the bridge across Big Smoky River, mileage 297.3, from Edmonton, Alberta, has been let to McPherson and Quigley, Edmonton. This consists of eight pedestals and two abutments of reinforced concrete. The contract for the steel superstructure has been let to the Dominion Bridge Co. This consists of the following spans: One 88 ft. 5 in. deck plate girder; 5 rivetted deck truss spans of 128 ft. each; 1 through truss span of 125 ft.; one 128 ft. rivetted deck truss span, and one 88 ft. 5 in. deck plate girder, a total length of 1,059 ft. 10 in. The bridge is approached from Edmonton by a 7 degree curve, terminating about 500 ft. from the first abutment. The base of the deck plate girder spans is 13 ft. 1 in.; the deck truss spans 7 ft. 2 in.; and the through span over the main channel, 16 ft. 7 in., above extreme high water level. The erection of the bridge is being proceeded with, and it is expected to have it completed early in the spring.

A press report states that tracklaying is being proceeded with on the west side of the Smoky River towards the Spirit River.

Grading on the Grande Prairie branch is reported completed with the exception of a couple of small cuts of about 500 yards long at mileage 24. (Dec., 1915, pg. 469.)

Grand Trunk Ry.—We are officially advised that the new freight shed at St. Catharines, Ont., is practically completed, and the team tracks in connection with it entirely so. (Dec., 1915, pg. 469.)

We are officially advised that the steel and brick freight house, nearing completion at St. Catharines, Ont., is 300 x 40 ft. There is a machinery platform at one end 50 x 40 ft.; and 2 additional team tracks have been installed with a capacity of 20 cars each. The freight office is inside the shed.

Grand Trunk Pacific Ry.—We were officially advised recently that the company expected to lay the track on its spur line to connect with the Dominion Government elevator at Moose Jaw by Dec. 31, 1915.

Great Northern Ry. Lines in Canada.—A bridge has been erected at a reported cost of \$60,000 on the Vancouver, Victoria and Eastern Ry. branch to the Granby smelter.

Preparatory work on the site of the new station at False Creek, Vancouver, was started Nov. 25, when test piles were driven at various spots. (Dec., 1915, pg. 469.)

Greater Winnipeg Water District.—The Department of Public Works' sanction is being asked to the plans under which the Greater Winnipeg Water District water supply works are being constructed. The works already completed include a railway of 95 miles from St. Boniface to Shoal Lake, a branch of the Lake of the Woods. (Dec., 1915, pg. 470.)

Intercolonial Ry.—We are officially advised that grading, track laying and ballasting has been completed on the branch line from near Dartmouth, N.S., to the Musquodoboit Valley, except one span of a bridge

which was expected to be done by Dec. 31. It is expected that construction will be started at an early date on the station houses and water tanks. W. A. Hendry, Dartmouth, N.S., is Engineer in Charge.

We are advised that about a year ago the Canadian Government Railways' engineering department made a survey for a line from Sydney via the shore of the Bras d'Or Lakes to St. Peters, N.S., the terminus of the Cape Breton Ry. Further surveys are reported to have been made in 1915. They are for the purpose of securing a better line than the existing one between the Strait of Canso and the Sydneys. (Dec., 1915, pg. 470.)

Kettle Valley Lines.—The Dominion Parliament is being asked to extend the time for the building of the following lines:—From near Otter Summit to the Aspen Grove mineral district, not exceeding 30 miles; from a point 50 miles from the north fork of the Kettle River to Fire Valley, northwesterly through the valley to Vernon, and on to a junction with the Nicola, Kamloops and Similkameen Ry., near Quilchena; from the junction of the east and west fork of the north fork of the Little River, on the last mentioned line, northwesterly to Franklin camp, and on to Killarney; from Hedley, on the line authorized to be built between Midway and Hedley northerly along Twenty Mile Creek for 20 miles. (Dec., 1915, pg. 475.)

We are officially advised that there are now less than 2 miles of track to be laid on the Coquihalla section. When this is completed the company will have a continuous track from Midway, the present terminus of the C.P.R. Crownsnest line, to a connection with the C.P.R. transcontinental line, about 2 miles west of Hope station, in all about 300 miles. This is entirely new construction, as also is the branch from Brodie to Merritt, 23 miles, giving connection with the C.P.R. branch from Spences Bridge to Merritt.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—Track was laid during 1915 on a branch line in North Dakota, from Van Hook to Sanish.

Moncton and Buctouche Ry.—We are officially advised that the company has in prospect a project for the extension of the line from Buctouche to Loggieville, N.B., 59 miles. Some surveys for this line have been made. E. G. Evans, Moncton, N.B., is General Manager.

Naas and Skeena Rivers Ry.—The British Columbia Legislature is being asked to extend the time for the building of this projected railway from Nasoga Gulf or Naas Bay on Portland Inlet, to the headwaters of the Skeena River. The provisional directors named in the act of incorporation which was passed in 1911, are:—G. H. Barnard, H. B. Robertson, Victoria; R. Campbell-Johnston, Vancouver; L. Benoit, Winnipeg; J. G. Scott, J. T. Ross, L. P. Pelletier, P. A. Choquette, G. LeMorne, Hon. N. Garneau (since deceased), A. E. Doucet, A. Gauvreau, O. E. Gauvreau, A. Hardy, J. G. Dube, C. E. Taschereau, W. Doheny, G. Proteau, Quebec, and B. Newgass, London, Eng. (Dec., 1911, pg. 1,139.)

Newfoundland Ry. and Train Ferry Syndicate.—The Newfoundland Legislature last session passed an act providing that in computing the time for the commencement and completion of the works authorized by sec. 4 of the act of 1914, and the lines limited by sections 12, 16, 17 and 19 of the same act, with regard to importation of supplies, plant, exclusive franchise and determination of rights respectively, the period between Aug. 4, 1914, and the date of the

issue of a proclamation that a state of war no longer exists between Great Britain and the countries with which hostilities are at present pending, shall not be counted or taken into consideration.

The original act provided that the syndicate, whose representative is H. C. Thompson, should have power to construct a railway across the isthmus of Avalton from Rantem or some other suitable point on Trimby Bay to Little Southern Harbor on Placentia Bay, and to operate a train ferry therefrom to Louisburg, N.S.; to construct a railway from Humbermouth, Bay of Islands, to South West Arm, Green Bay, with a branch to White Bay, and to operate a train ferry to Gaspé, Que. The act set out that this latter railway had been approximately located, and provided for the granting of a right of way 200 ft. wide for the same from unoccupied crown lands, a block of land five square miles in extent, with a sea frontage of one mile, if available, at each of the proposed terminal points, such lands not to be granted until the completion of the railway line or lines. The first line to be commenced within three years (sec. 4), and to be completed within four years from the date of the passing of the act; the second line to be commenced within five years from the completion of the first, and to be completed within three years from the date of its commencement. All construction plant and equipment necessary for the construction and establishment of the railways, train ferries, and train ferry slips is to be admitted free of duty, except in so far as they are to replace original stock. For 20 years (sec. 12) from the date of passing of the act the syndicate can import, free of duty, the plant necessary for the original construction of cold storage and other purposes in order to develop traffic for its line. The syndicate, by sec. 16, is to furnish plans for its projected lines within two years, and by sec. 17, the Government agrees not to grant franchises to any other company or companies for lines within these areas. The syndicate may assign its rights to any company necessary for the carrying out of the plans.

The effect of the act passed last session is to substitute for the date of the passing of the act of 1914, the date of the proclamation of the ending of the present war, as the initial date for the commencement of the franchise. (May, 1914, pg. 214.)

Ontario Niagara Connecting Bridge Co.—The Dominion Parliament is being asked to incorporate a company with this title, to construct a railway and general traffic bridge with approaches and terminal facilities, over the Niagara River, at some point between the intersection of the northerly boundary of Welland County with the Niagara River, and the intersection of a line running east and west parallel to such boundary line, and distant 6,000 ft. southerly therefrom. A. Fraser, Niagara Falls, Ont., solicitor for applicants.

Pacific Great Eastern Ry.—Tracklaying was reported, Dec. 14, to have reached to within half a mile of Clinton, B.C., about 47 miles northeasterly from Lillooet, to which point track was laid in 1914. Construction is reported as being practically completed on the two bridges on the Squamish side of Clinton. (Oct., 1915, pg. 392.)

Peace River Tramway and Navigation Co.—The Dominion Parliament is being asked to extend the time for the building of the projected tramways, at Peace River Chutes, and Slave River Falls, Alta. (Sept., pg. 346.)

Quebec Central Ry.—In 1906 the Quebec Legislature passed an act, in the preamble of which it was stated that owing to the spring inundations and floods in the Chandiere Valley, the portion of its line from

Beauce Jct. and Beauceville could not be operated satisfactorily, and the enacting sections gave the company power to build and operate the Quebec Chandiere Extension, "by diverting and rebuilding that portion of the present line from Beauce Jct. to Beauceville," and thence on to a junction with the Temiscouata Ry., 175 miles. In accordance with this act the Beauce Jct.-Beauceville Branch was abandoned, and a new line built, the connecting point with the main line being now known as Valley Jct. Up to the end of 1914, track had been laid on this line to St. Camille, 61 miles from Valley Jct., and during 1915 track was laid for a further distance of 14 miles to English Lake. Application is now being made to the Quebec Legislature for an extension of time for the completion of the line to Cabano. The next section to be built, we are officially advised, will be that from English Lake to Droune Tp., L'Islet County, 25 miles. J. H. Walsh, Sherbrooke, Que., is General Manager. (Sept., 1914, pg. 419.)

Quebec, Montreal and Southern Ry.—The Dominion Parliament is being asked for an extension of time for the construction of the projected extension of the Q., M. and S. R. from Noyan Jct. to the International Boundary, and for the completion of any line which the old South Shore Ry. was authorized to construct.

Reid Newfoundland Ry.—Of the branch line construction authorized by the act of 1912, there are still uncompleted:—Baie de Verde Branch from Carbonear to Grates Cove, 45 miles; Fortune Bay Branch, from Goobies to Terranceville, 60 miles, and Bonne Bay Branch, from Deer Lake to Bonne Bay, 45 miles. Track has been laid on the first of these three branches, and a temporary train service is being operated, but the snow fences, sidings and station platforms are not completed. On the Fortune Bay Branch track has been laid for 43 miles, but no construction was done during 1915. Some grading has been done on the Bonne Bay Branch, but nothing was done during 1915. (Sept., 1915, pg. 341.)

St. John and Quebec Ry.—Tenders for the construction and equipment (without rolling stock) of the uncompleted portions of this railway were received by I. R. Todd, President, Dec. 30. The tenderers were asked to submit a price per mile for a complete line of railway, ready for operation, in accordance with plans, profiles and specifications preferred and approved by the New Brunswick Government which is financing construction, and by the Dominion Government which will operate the line under lease. The sections for the building of which tenders were asked are:—Gageville to St. John, N.B., 52.00 miles, and Centreville to Andover, N.B., 25.5 miles. (Oct., 1915, pg. 396.)

Toronto Terminals Ry. Co.—Considerable work has been done on the foundations for the new union station on Front St., Toronto, by the Lyall Construction Co. The rock to which the foundations are being carried is 6 ft. below water level. About 200 caissons have been prepared and sunk into position, and the greater part of the concrete filling has been put in place. It is expected that the basement section of the building will have been finished by Mar. 1, and that actual erection of the superstructure will be started in the spring.

Reduction of Scotch Railway Service.—A London, Eng., press dispatch, Dec. 23, stated that, as an effect of the war, there has been a drastic curtailment in passenger service on all railways in Scotland. From Jan. 1, it is stated, practically all passenger traffic will be suspended after 9 p.m., owing to depleted staffs and to shortage of locomotives.

Traffic Orders by the Board of Railway Commissioners.

Switching Cars at Kelowna, B.C.

24480. Nov. 24. Re complaint of Kelowna Board of Trade against the charge of \$2.50 a car made by C.P.R. for switching cars between the car barge and land team tracks, or private sidings, at Kelowna, B.C., it is ordered that the C.P.R. be authorized to make a charge of \$1.75 a car for the additional service of switching cars between the dock and land team tracks and private sidings at Kelowna, and to publish and file an amendment to its Tariff C.R.C. no. W-2027 accordingly.

Apple and Potato Rates to Halifax.

24489. Nov. 27. Re complaint of United Fruit Growers, the Nova Scotia Fruit Growers, and the King's County Board of Trade against the advanced rates on apples and potatoes to Halifax for export; and order 24313, Oct. 16, 1915, suspending the said rates as published in the Dominion Atlantic Ry. tariffs, C.P.R. 454 and C.R.C. 455. Upon hearing the complaint at Kentville, N.S., Oct. 22, 1915, the complainants, the railway company, fruit growers, and apple dealers being represented at the hearing, and upon the report of the Chief Traffic Officer of the Board, it is ordered that the said order 24313 be rescinded; and that the said tariffs may become effective on Dec. 10, 1915.

Suit Over Rogers Pass Tunnel Construction.

The Vancouver Province says:—"The damage claim which McIlwee & Sons, tunnel borers, of Denver, Col., have brought against Foley Bros., Welch & Stewart over the boring of the tunnel at Rogers Pass in the Selkirks, has been increased from \$527,000, which it was at the original trial, to \$642,000. The enlargement in the amount claimed, which was consented to by Mr. Justice Macdonald, is said to be the result of observations on the character of the rock encountered in the big bore. McIlwee & Sons claim that if they had been allowed to complete their contract they would have made larger profits than they at first anticipated owing to the easy nature of the rock encountered. As profits on the pioneer bore the plaintiffs at first claimed at the rate of \$7.63 a foot. This is increased to \$11.44 a foot. Their estimated profits on the centre heading they had placed at \$7.44 a foot; this is increased to \$10.08 a foot. In addition they claim the full amount of the \$250,000 bonus promised for rapid construction.

"At the original trial Mr. Justice Clement found in favor of the defendants for under \$40,000, holding that it was the duty of McIlwee & Sons to return and resume the contract after the defendants had agreed to allow them to resume, six weeks after having cancelled their contract. The Court of Appeal took the contrary view of the law, and held that McIlwee & Sons was not obliged to resume, and sent the case back to the Supreme Court again to assess damages on the basis of the whole contract. This action is being appealed to the Privy Council by Foley Bros., Welch & Stewart.

"In the case preparing for the Supreme Court the defendants have abandoned their original plea that they were justified in cancelling the contract, and are now working entirely on pleas for the mitigation of damages. The plaintiffs amended claim for damages is \$642,000 for loss of profits."

The Northern Pacific Ry. has been sued by the Royal Trust Co., for \$1,200 for two months rent of officers in the Dominion Building, Vancouver.

Canadian Northern Railway Construction, Betterments. Etc.

Canadian Northern Quebec Ry.—We are officially advised that the company is building a line from Arundel to St. Remi, Que., 11 miles, with its own forces and that track has been laid on the first two miles, from Arundel to Rouge River.

Canadian Northern Ontario Ry.—A track at mileage 249.75 from Todmorden, to facilitate the transfer of cars between the C.N.O.R. and the G.T.R. at Ottawa was built some time ago, but has not been used, until the issue of an order by the Board of Railway Commissioners, recently, the G.T.R. having seriously objected.

The Dominion Parliament is being asked to confirm an agreement between the company and the Canadian Pacific Ry. respecting the operation of joint tracks and terminals in Toronto. This agreement covers the building and use of the tracks across the northern part of Toronto, and the new union station in course of construction on Yonge St. (north). The tracks which are joint tracks, and those which are C.N.O.R. or C.P.R., are specifically defined, and the conditions upon which they are to be used by both companies are fully set out, as also are the terms. An agreement for this purpose was before Parliament for ratification last year, but was withdrawn.

The Dominion Parliament is being asked to extend the time for the construction of the following lines: From Toronto via Hamilton and London to Windsor, with a branch to St. Thomas and Sarnia; from near the head of Long Lake northwesterly to a junction with the Transcontinental Ry. east of Lake Nipigon.

The Dominion Parliament is also being asked to approve an agreement between the company, and the Canadian Northern Ry., on the one hand and the Canadian Pacific Ry. on the other, respecting the use of joint tracks at Port Arthur. Among the lines affected by this agreement are the two miles of the C.P.R., which are being operated over and connecting the Canadian Northern eastern terminal with the westerly end of Canadian Northern Ontario. The switch connecting the C.N.R. with the C.P.R. was reported installed Dec. 4.

Toronto, Niagara and Western Ry.—The Dominion Parliament is being asked to extend the time for the building of the following lines: From Toronto to Hamilton; from Hamilton to the International Boundary near Grand Island, or Niagara Falls, Ont., and, with the consent of the proper authorities, to a point in New York State, with branch lines from St. Catharines to Welland; and from Hamilton, via Brantford, Woodstock, London and Chatham, to Windsor.

Canadian Northern Ry.—In a recent interview at Port Arthur, Ont., M. H. MacLeod, General Manager and Chief Engineer, is reported to have said that from time to time improvements would be made on the roadbed, as the necessities of traffic demanded. The attention of the officers of the line would have, he is said to have added, to be given very shortly to the necessity for building second track between Port Arthur and Winnipeg.

The Dominion Parliament is being asked to extend the time for the building of the projected line from near Grosse Isle on the company's Oak Point branch, northerly and westerly to Grand Rapids, with a branch to Sturgeon Bay, Man.

We are officially advised that the company has under construction the following lines in Saskatchewan: An extension of the Elrose branch from its present terminus at Eston, westerly for 35 miles; an extension

of the line now terminating at Preeceville, Sask., for 25 miles westerly.

We are officially advised that track has been laid on 43 miles of the extension of the line southeasterly from Camrose, the grading on which has been completed to the Battle River, 60 miles from Camrose, Alberta. A press report says that track-laying work will be completed to the Battle River before the work is stopped. We are also advised that grading is in progress for a further distance of 23 miles. The line is projected southeasterly to a junction with the Saskatoon-Calgary line near Sibbald, and is being built under the Canadian Northern Western Ry.'s charter. Under this charter there is also being built a line from Oliver to St. Paul de Melis. R. H. Douglas, engineer, Alberta Department of Railways, is reported to have said recently that 80 miles had been practically completed on the Oliver-St. Paul de Metis branch, and that it was expected to complete the grading on a further eight miles by Dec. 1. This would take the grading to between ranges 13 and 14.

The line to Peace River branches off from the transcontinental line at Onoway and is in operation to San Guido on the Pembina River, 65 miles from Edmonton. A second lift of ballast was given during the past season. The bridge across the Pembina River is completed and some track is reported to have been laid from the bridge towards the MacLeod River, the grading to which point is completed.

The other line in Alberta upon which work is in progress is from Calgary to Pincher Creek, 141 miles.

The contractors engaged on the several lines are: Northern Construction Co., Winnipeg and Western Construction Co., W. J. Cowan, and D. F. McArthur, all having headquarters in Winnipeg.

Canadian Northern Pacific Ry.—A press report states that an arrangement has been reached between the company and the authorities interested in the Vancouver area respecting the manner of carrying the company's tracks across the harbor. The method of crossing will, it is said, be by a bridge.

A writ was issued, Dec. 2, at the instance of Champion and French, against the C.N.P. Ry., and the Vancouver City Council, asking for a declaration that the plaintiffs were entitled to the unrestricted use of the foreshore adjoining lots 33 to 36, block 23 on False creek, and for an injunction restraining the company from building a seawall, the contract for which has been let. The plaintiffs own a wharf on the creek, which it is claimed was erected without the permission of the Dominion Government, and that therefore they have no riparian rights. The railway company and the city, however, have a crown grant, and the sea wall is being built under an agreement between the company and the city. The Vancouver Harbor Board passed a resolution on Dec. 3 requiring Champion and White to remove their vessels and scows from the area in question, and authorized the Harbor Master to remove them after a specific date, if they had not then been removed. The case came to a hearing Dec. 9, when Justice Morrison dissolved the injunction. He decided that the building of the sea wall is for the public benefit, but the plaintiffs may be entitled to recover damages.

The Lulu Island branch is located from the westerly approach to the New Westminster bridge, to Steveston, 15.35 miles. It is built from mileage 5.42 to Steveston.

We are officially advised that the uncompleted portion will be proceeded with and completed at an early date. Track connection between the mainland and Lulu Island will be made by an opening span bridge over the north arm of the Fraser River.

Vancouver Island Lines.—We are officially advised that rails for the Victoria-Patricia Bay line, 15.22 miles, will be laid, and the line completed at an early date.

As to the docking facilities to be provided for the car ferry traffic with the mainland, we are informed that all details are not yet settled, but it is expected that wharfage accommodation will be provided both at Patricia Bay and at Woodward, Lulu Island, during next summer. (Dec., 1915, pg. 474.)

Freight and Passenger Traffic Notes.

The C.P.R. proposes to improve its service to Owen Sound, Ont., by running the Hanover-Saugeen Junction train through to that port.

Edmonton, Dunvegan and British Columbia Ry. trains are being operated by telephone, the dispatching office being at Edmonton, Alta.

The Canadian Northern Ry. Peace River Branch bi-weekly service from Onoway to Bangor, Alberta, is, it is reported, to be made a daily service.

The Dominion Government Railway to Hudson Bay is operating a weekly train service from Pas, Man., to the Manitou Rapids, Nelson River, 242 miles.

The extension of the Canadian Northern Ry.'s Saskatoon-Elrose branch, from Elrose to Eston, Sask., 35 miles, is said to have been given a bi-weekly service.

The C.P.R. train service between Lardo and Gerrard, B.C., and the steam boat service on Trout Lake was discontinued, Nov. 30. It is reported that the rolling stock is to be removed and the service abandoned indefinitely.

The Canadian Government Railways management is said to be arranging for the through haulage of wheat from Winnipeg, Man., to Moncton, N.B., by the National Transcontinental Ry., and then on to St. John, N.B., by the Intercolonial Ry.

The G.T.R. has inaugurated a new sleeping car service between Sherbrooke and Montreal, each night, including Sundays. The cars are ready for occupancy at 10 p.m., and the train leaves Sherbrooke at 3.15 a.m., arriving at Montreal at 7.25 a.m.

The Canadian Northern Ry.'s liability to pay a business tax on offices in Winnipeg has been questioned. The company claims it is exempt under an agreement made when it took over the old Red River Ry. The question is before Judge Macdonald as referee.

The Canadian Northern Ry. has opened a downtown ticket office on Hastings St., Vancouver, B.C., adjoining the Great Northern Ry. office. A temporary ticket office has been opened at 172 Hastings St. West. Freight matters will be attended to at a temporary office in the Metropolitan Building.

The Intercolonial Ry. freight office in Quebec City was transferred from the terminal at the foot of Jarvis St., to the C.P.R. Palais station, on Dec. 1. When the new union station now under construction is completed the entire freight business of the Canadian Government Railways will, it is said, be concentrated there.

A steel truss bridge over the Spokane River at Spokane, Wash., collapsed on Dec. 18 under two passing electric cars. Seven persons were killed and 10 injured.

Mainly About Railway People Throughout Canada.

Sir Thomas and Lady Tait celebrated the 25th anniversary of their wedding at Montreal, Dec. 10.

C. C. Goodrich, President, Twin City Rapid Transit Co., died at Minneapolis, Minn., Dec. 21.

F. J. Moss, Emigration Agent, Canadian Northern Ry., London, England, has joined Canadian Pay and Record Office staff, temporarily.

Hugh Fleming, who has been appointed a captain in the Army Service Corps, is a son of the late **Sir Sandford Fleming**, a director of the C.P.R.

Mrs. A. H. Dunlap, who died in Toronto, Dec. 14, aged 86, was the mother in law of **Hon. Frank Cochrane**, M.P., Minister of Railways and Canals.

H. G. Elliott, formerly General Passenger Agent, Grand Trunk Ry., has been elected an honorary member of the American Association of Passenger Traffic Officers.

James Dunsmuir, director, C.P.R., has promised to contribute \$1,000 a month, during the continuation of the war, to the Patriotic Aid Society in British Columbia.

Countess Jacques de Lesseps, daughter of **Sir William Mackenzie**, President, Canadian Northern Ry., is giving her services as a nurse in one of the military hospitals in Paris, France.

T. W. Connette, Assistant Superintendent of Transportation, Buffalo Division, International Ry., Buffalo, N.Y., has been appointed Superintendent of Transportation of the division.

R. H. Crew, General Yardmaster, G.T.R., Mimico, Ont., died suddenly, following an attack of apoplexy, Dec. 7, aged 55. At the time of the seizure he was inspecting the company's East Toronto yards.

T. H. White, M.Can.Soc.C.E., Chief Engineer, Canadian Northern Pacific Ry., Vancouver, B.C., has been elected Chairman of the Canadian Society of Civil Engineers' recently organized British Columbia division.

Wm. L. Crawford, who was for many years associated with the late H. M. Flagler in the development of Florida, and was for many years General Manager of the Florida East Coast Ry., died in Garwood, N.J., Nov. 13, aged 74.

Wm. Downie, formerly General Superintendent, Atlantic Division, Canadian Pacific Ry., St. John, N.B., who was operated on in Toronto, Nov. 1, for gall stones, was able to leave the hospital on Dec. 16 and to return to his home at Whitby, Ont.

G. Goodwin, who died at Ottawa, Nov. 29, aged 72, was, before he retired from active life, a general builder and contractor, and was at various times connected with the construction of railways, canals, locks and other transportation facilities.

Mrs. Goodfellow, wife of **John Goodfellow**, Superintendent, Esquimalt and Nanaimo Ry., Victoria, B.C., died there, Dec. 5, after a year's illness. She was a native of Dalhousie, N.B., and resided in Vancouver for a short while before removing to Victoria in 1905.

Mrs. Johnson, widow of the late **Lacey R. Johnson**, General Welfare Agent, Canadian Pacific Ry., Montreal, is taking an active part in providing Christmas cheer for the wives and families of men of the Montreal Heavy Artillery Brigade who are on active service.

Mrs. Alfred T. Shaughnessy, of Montreal, has left for England with her children to join **Capt. Shaughnessy**, son of **Sir Thos. G. Shaughnessy**, and who is in the 60th Bat-

talion. One of **Sir Thomas'** sons in law, **Lieut. R. M. Redmond**, is with the same battalion.

Paul F. Sise, Vice President, Northern Electric Co., Ltd., Montreal, is on service with the 148th Battalion, Canadian Overseas Expeditionary Forces, with the rank of captain and adjutant. The battalion's present headquarters are the old High School building on Peel St., Montreal.

D. A. MacDonald, who died at Regina, Sask., Dec. 11, aged 58, was engaged on construction work on the C.P.R., when the line to the west was being built. He gave up this work in 1882, when the line had reached Moose Jaw, and returned to Regina, where he settled.

T. E. Doyle, who died recently at Kenora, Ont., worked on the construction of the C.P.R. in its early days, between Fort Wil-



Gordon St. G. Sproule,
Engineer of Tests, Canadian Pacific Railway.

liam and the Rockies, and was section foreman at Kenora, Ont., for 15 years, and Roadmaster, Banff, Alta., for some time before retiring from active service.

L. C. Ord, Assistant Works Manager of Car Shops, C.P.R., Montreal, having been appointed a Lieutenant on No. 1 Overseas Battery of Siege Artillery, Canadian Expeditionary Force, has been granted extended leave of absence. He sailed from Halifax, N.S., for Europe, Nov. 22.

W. H. Williams, Vice President, Delaware & Hudson Co., has been elected Chairman of the Board of Directors and Chairman of the Executive Committee of the newly reorganized Wabash Co. He will continue his work as Vice President of the Delaware & Hudson.

Lieut. H. F. H. Hertzog, Jr., M.Can.Soc.C.E., of the Royal Canadian Engineers, who is on active service in Europe, and who has been promoted to the rank of Captain, is a son of **A. L. Hertberg**, M.Can.Soc.C.E., Division Engineer, C.P.R., Toronto, and was formerly with the Trussed Concrete Steel Co. of Canada, Walkerville, Ont.

Hon. Frank Cochrane, Minister of Railways and Canals, left Ottawa, Dec. 30, for England to see his two sons before they go to the front in France. He will probably visit the front before returning, and is expected back in Ottawa about the end of January.

Thos. R. Burpee, who was secretary to the late **Sir Sandford Fleming**, when the latter was Chief Engineer of the Intercolonial Ry. and of the Canadian Pacific Ry. prior to the latter road passing into the hands of the present company, and who was subsequently Deputy Dominion Lands Commissioner at Winnipeg for some years, died in Ottawa, Dec. 1.

Edward FitzGerald, Assistant General Purchasing Agent, Canadian Pacific Ry., who has been acting, since May, 1915, as Purchasing Agent for the British War Office, has removed with his staff from 114 Windsor St. Station, Montreal, to Ottawa, where he is also acting in connection with the Imperial Munitions Board.

The Hon. Angus McDonnell, who has been living in Vancouver, B.C., for several years, during part of which time he was a partner in the railway contracting firm of **Grant Smith and McDonnell**, has left for his family's seat, **Glenarms Castle**, County Antrim, Ireland. **Lord Dunluce**, his eldest brother, was killed recently in France, and **Mr. McDonnell** intends to join the army.

W. P. Hinton, Traffic Manager, Grand Trunk Pacific Ry., and Western Traffic Manager, Canadian Government Railways, was the guest of the Winnipeg Transportation Club, Nov. 30, on his return to Winnipeg, to take up his new appointments. From Apr., 1909, to Oct., 1914, he resided in Winnipeg, where he occupied the positions of General Passenger Agent and Assistant Passenger Traffic Manager, G.T.P.R., consecutively.

Sir Thomas Tait, President, **Fredericton and Grand Lake Coal & Ry. Co.**, is President of the Citizens Recruiting Association (English speaking section), which has its headquarters in Montreal, and of which **Sir Thos. G. Shaughnessy** is Honorary President. He is taking a very active part in the work, which covers the 4th divisional area, that is the western part of the Province of Quebec.

Edward James Worth, who has been appointed Car Service Agent, Atlantic Division, C.P.R., St. John, N.B., was born at Toronto, July 29, 1887, and entered C.P.R. service, Apr. 5, 1905, since when he has been, to June, 1907, operator at various points on the Ontario Division; June, 1907, to Mar., 1908, operator, Moose Jaw, Sask.; Mar. to July, 1908, operator at various points on the Ontario Division; July, 1908, to Apr., 1914, dispatcher, London, Ont.; Apr., 1914, to Jan., 1915, Train and Station Inspector, Toronto; Jan. to Dec. 1, 1915, dispatcher, London, Ont.

A. J. Gayfer, whose appointment as Division Engineer, Canadian Northern Ry., **Hornepayne**, Ont., was announced in a recent issue, was formerly on **Mackenzie, Mann and Co.**'s engineering staff, and from 1898 to 1899, was engaged on surveys between **Fort Frances**, Ont., and **Winnipeg**; 1899 to 1902, office assistant to Division Engineer of Construction for the same territory. From 1902 to 1911 on construction work, **Grand Trunk Pacific Ry.**, and returned to **Mackenzie, Mann and Co.**'s staff, working on the **Canadian Northern** main line east of **Port Arthur** until 1912, when he was appointed Division Engineer on construction, **Port Arthur District**, which position he held until his present appointment.

Thomas James Hennessey, formerly Division Master Mechanic, Michigan Central Rd., Bay City, Mich., died Dec. 4. He was born at London, Ont., Jan. 1, 1845, and entered M. C.R. service in October, 1872, since when he was, to Apr., 1874, locomotive foreman; Apr., 1874, to Sept. 1, 1889, locomotive driver; Sept. 1, 1889, to May 20, 1893, Travelling Engineer; May 20, 1893, to May 1, 1896, Division Master Mechanic, Detroit, Mich.; May 1, 1896, to Jan. 1, 1902, Division Master Mechanic, Jackson, Mich.; Jan. 1, 1902, to Feb. 1, 1915, Division Master Mechanic, Bay City, Mich. On account of reaching the age limit, he retired from active service Feb. 1, 1915.

Kenneth deSola Joseph, whose appointment as Assistant Trainmaster, District 1, Atlantic Division, C.P.R., Brownville Jct., Me., was announced in our last issue, was born at Quebec, Que., Oct. 6, 1892, and entered C.P.R. service, May 6, 1910, since when he has been, to Aug. 31, 1912, chairman, Marquette, Man.; May 1, 1913, to Nov. 15, 1915, transportation student, Eastern Lines, C.P.R., and following the special course of training in connection with the engineering course at McGill University, except for the period from Nov. 1, 1913, to Apr. 1, 1914, when he was telegraph operator, Lake Superior Division, C.P.R.

W. P. Wilgar, B.A.Sc., M.Can.Soc.C.E., who was on the National Transcontinental Ry.'s engineering staff from 1905 to 1914 as locating engineer, Division Engineer and Assistant District Engineer respectively, and who was appointed in Sept., 1914, as Professor of Civil Engineering, Queens University, Kingston, Ont., is now performing military service. On Mar. 15, 1915, he was appointed Captain in the Canadian Engineers, and on Sept. 11, 1915, was appointed temporary Major while commanding the 5th Field Company, Canadian Engineers, at Kingston. He is now Officer Commanding Instruction, Canadian Engineers Training Depot, Ottawa.

Albert Charles Harris, Superintendent, Welland Ship Canal Construction Ry., whose article describing the line appears on another page of this issue, was born at Stratford, Ont., Jan. 23, 1888. He entered railway service May 17, 1905, since when he has been consecutively, to Oct. 18, 1908, machinist, Grand Trunk Ry. shops, Stratford; Oct. 19, 1908, to July 10, 1909, assistant agent, G.T.R., Drumbo, Ont.; July 10, 1909, to Aug. 1910, telegraph operator, G.T.R., Ridgeway, Ont.; Aug., 1910, to July 18, 1912, operator and ticket agent, G.T.R., Goderich, Ont.; July 18, 1912, to April 21, 1914, operator and relieving dispatcher, G.T.R., Stratford; May 4, 1914, to date, Superintendent, Welland Ship Canal Construction Ry., Homer, Ont.

Henry Eugene Haanel, who was appointed Trainmaster, District 1, Saskatchewan Division, Regina, recently, was born at Cobourg, Ont., Nov. 2, 1880, and entered transportation service, April, 1901, since when he has been, to July, 1901, stenographer, Canadian Northern Express and Telegraph Cos., Winnipeg; July, 1901, to Sept., 1903, chief clerk, same companies, Winnipeg; Sept., 1903, to Aug., 1904, chief clerk in yard office, Canadian Northern Ry., Winnipeg; Aug., 1904, to Apr., 1905, West Yard Agent, C.N.R., Winnipeg; Apr., 1905, to May, 1906, chief clerk, District 2, C.N.R., Winnipeg; May, 1906, to Jan., 1907, chief clerk, Winnipeg Terminals, C.P.R., Winnipeg; Jan. to June, 1907, chief clerk, District 4, C.P.R., Brandon, Man.; June to Sept., 1907, chief clerk, Car Service Department, Western Lines, C.P.R., Winnipeg; Sept., 1907, to Dec., 1910, chief clerk to General Superintendent, Central Division, C.P.R., Winnipeg; Dec., 1910, to Dec., 1912, Trainmaster, District 3, Manitoba Division, Brandon;

Dec., 1912, to Feb., 1913, acting Superintendent, District 3, Manitoba Division, Brandon; Feb., 1913, to the date of his present appointment, Trainmaster, District 1, Manitoba Division, Kenora, Ont.

F. L. Wanklyn, General Executive Assistant, C.P.R., was plaintiff in a recent action against O. Asselin, Montreal, claiming \$15,000 damages for slander while he was a member of the Montreal Board of Control. The action was taken on an article in L'Action, condemning the conditions in the Board of Control as being corrupt and rotten, and naming Mr. Wanklyn as largely responsible. In delivering judgment Justice Greenshields said that citizens sensible of their reputations and jealous of their fellow citizens' regard, will not enter into a public office, feeling that through no fault of theirs, when they issue forth, their reputation will be but a thing of shreds and patches. In awarding nominal damages of \$150, with costs, based on a \$15,000 case, he stated that the plaintiff did not seek a money condemnation, and it must not be thought that the amount awarded was the judge's appreciation in dollars and cents of the value of a public man's reputation.

Harry Thornton Ruhl, whose appointment as Division Engineer, Canadian Government Railways, Moncton, N.B., was announced in our last issue, was born at Mifflinburg, Pa., Sept. 29, 1882, and entered railway service, Sept. 1902, since when he has been, to June, 1904, rodman, C.P.R., Nominigue, Que.; June, 1904, to July, 1905, transit man, Construction Department, C.P.R., Residency 3, Toronto-Sudbury Branch; July to Aug., 1905, transit man on location, C.P.R., Ingersoll, Ont.; Aug. to Oct., 1905, transit man, bridge surveys, C.P.R., Coldwater, Ont.; Oct., 1905, to Jan., 1906, transit man, bridge surveys, Parry Sound, Ont.; Jan. to May, 1906, transit man on location, Parry Sound, Ont.; May, 1906, to Jan., 1908, Resident Engineer on Construction, C.P.R., Point au Baril, Ont.; Jan. to Oct., 1908, Resident Engineer on Construction, C.P.R., Muskoka, Ont.; Oct., 1908, to Nov., 1909, transit man, Maintenance of Way, C.P.R., North Bay, Ont.; Nov., 1909, to Oct., 1911, Resident Engineer, Maintenance of Way, District 1, Sudbury, Ont.; Oct., 1911, to Sept., 1913, Resident Engineer, District 1, Eastern Division, C.P.R., Farnham, Que.; Sept., 1913, to Nov. 20, 1915, Resident Engineer, Maintenance of Way, Intercolonial Ry., New Glasgow, N.S.

W. H. Grant, Manager of Construction, Mackenzie, Mann and Co., Toronto, whose additional appointment as Tie and Timber Agent, Eastern Lines, Canadian Northern Ry., was announced in our last issue, was born at Acton, Ont., Dec. 8, 1858. He commenced railway construction with D. D. Mann in 1882, and with the exception of eight years spent in Winnipeg, Calgary and British Columbia, he has since been continuously engaged in railway work, first with D. D. Mann, and later with Mackenzie, Mann and Co. During this time he acted as accountant, Superintendent, and Manager of Construction, and was with Mr. Mann on his contracts on the C.P.R. main line on the prairies and in the British Columbia mountains, and built 75 miles of the Manitoba and Northwestern Ry. main line and the Russell and Rapid City branches. He laid the track on the 40 miles of the old Winnipeg and Hudson Bay Ry., and had charge of one section of Mackenzie and Mann's contracts on the C.P.R. short line through Maine. During the construction of the Ontario and Rainy River Ry. he was Superintendent of the grading and bridging from Port Arthur to Fort Frances, and after completion of that line, in 1902, he was sent to Nova Scotia, where he built 247 miles of a line which is now comprised in the Halifax

and South Western Ry. He was appointed Manager of Construction, Mackenzie, Mann and Co.'s lines east of Port Arthur, in 1907, and altogether, has had charge of 680 miles of that company's system.

Gordon St. George Sproule, who has been appointed Engineer of Tests, C.P.R., Montreal, as mentioned in Canadian Railway and Marine World for December, and whose portrait appears in this issue, was born there, April 23, 1885, and is a son of the late Wm. J. Sproule, M.A.E., for many years Chief Assistant Engineer, Montreal Harbor Commissioners. He was educated at St. Lambert Academy, Montreal Business College, and Montreal High School, with periods of employment with Canadian Fairbanks Co., Milton L. Hersey, analyst, and H. C. Stone, architect. Matriculated in applied science, McGill University, 1903. Spent vacation of 1904 as junior under the late Cecil B. Smith, Resident Engineer, Canadian Niagara Power Co.; vacation 1905 and term 1905-06 under Mr. Smith, first in his consulting offices, then as Secretary of Hydro-Electric Power Commission of Ontario, of which he was Chief Engineer. Vacation 1907 on conducted trip through mines and smelters of Southern British Columbia, and on practical work in Hall Mines Lead Smelter, Nelson, B.C. Graduated 1908 as B.Sc. in mining engineering, with honors in design and machinery. Granted Milton Hersey research fellowship in metallurgical engineering. Obtained M.Sc. in 1909 and Governor-General's medal for research work. 1909-10 continued research work at McGill and demonstrated in physics and metallography. Entered C.P.R. employ, June, 1910, as Assistant Wheel Inspector, becoming in succession Wheel Inspector and Assistant Engineer of Tests, till E. B. Tilt's resignation in May, 1915, since when he has been Engineer of Tests. In Jan., 1912, he married Miss Helen L. Freeze, B.A., of St. John, N.B., and has two sons. Is fond of rifle and pistol shooting, photography, handicrafts, swimming, etc.

Toronto, Hamilton and Buffalo Ry. asks power to make agreements.—Application is being made to the Dominion Parliament to authorize the company to make with the Canada Southern Ry., the Michigan Central Rd., the New York Central Rd., the Canadian Pacific Ry., or any of them, any of the agreements authorized to be made between railway companies by Sec. 364 of the Railway Act, for 50 years. This section provides for the making of any agreement for the interchange of traffic, and for the division and apportionment of tolls, for the running of trains over each other's tracks, for the management and working of railways, and to provide for the appointment of joint committees, provided such agreements are not inconsistent with the special acts of the companies party to it, that they have received the consent of the shareholders, and are sanctioned by the Board of Railway Commissioners.

The Terminal Commission of Massachusetts visited Montreal, Dec. 9, the members being entertained to dinner there, after inspecting the railway terminals and port facilities. The chief object of the visit was to study general conditions with a view to improving freight handling conditions at Boston. Among those who spoke at the dinner were: W. G. Ross, Chairman, Montreal Harbor Commissioners; G. M. Bosworth, Vice President (Traffic), C.P.R., and Chairman Canadian Pacific Ocean Services, Ltd.; J. E. Dalrymple, Vice President (Traffic), G.T.R. and Grand Trunk Pacific Ry., and L. C. Fritch, Assistant to President, and General Manager, Eastern Lines, Canadian Northern Ry.

Steam Railway Track Laid in 1915.

The preliminary table of new track laid in 1915 by railways throughout Canada, made up from official replies to our annual circular, and from estimates made from information otherwise obtained, is given below. The total mileage is considerably below what it has been for the previous 10 years or more, but it is higher than was anticipated a year ago would have been the case. Tracklaying was done on 14 lines during the year, 44 miles being in Eastern Canada, 58 miles in Manitoba, and the balance in Saskatchewan, Alberta and British Columbia.

The mileage on the railways marked with an asterisk (*) has been estimated, and is subject to revision.

	Miles.	Miles.
Alberta and Great Waterways Ry.:		
Mileage 135 to 175, Alberta.....	40.00	
Canadian Northern Ontario Ry.:		
Between Ottawa and Pembroke.....	1.55	
Between Pembroke and Capreol.....	7.41	
Canadian Northern Ry.:		8.96
Grand Manas to Victoria Beach.....	14.07	
Canora to Sturgis, Sask.....	21.44	
Bienfait to Estevan, Sask.....	8.91	
Elrose to Eston, Sask.....	34.81	
Wroxton to Willowbrook, Sask., Canadian Northern Sask. Ry.....	41.01	
Camrose, south easterly, Canadian Northern Western Ry.....	43.00	
Canadian Pacific Ry.:		163.21
Coronation, Sask., west.....	0.75	
Foremost to Pakowki, Alta.....	22.30	
		23.05
Central Canada Ry.:		
McLennan to Heart River, Alta. Edmonton, Dunvegan, and B.C. Ry.:		46.00
Mileage 243 to 325.....		82.00
Essex Terminal Ry.:		
Sandwich to Ojibway, Ont.....		2.00
Halifax and Southwestern Ry.:		
Jordan Falls Station to Jordan Falls N.S.....		1.29
Hudson Bay Ry. (Dominion Government):		
Mileage 197.4 to 241.24.....		43.84
Intercolonial Ry.:		
Connection with Transcontinental Ry. at Moncton, N.B.....	0.85	
Dartmouth branch, Elderbank to Upper Musquodoboit, N.S.....	17.00	
		17.85
*Kettle Valley Lines:		
Between Midway and Merritt, B.C.....	31.00	
Coquihella Rives section.....	33.00	
		64.00
*Pacific Great Eastern Ry.:		
Mileage 120 to Clinton.....		46.00
Quebec Central Ry.:		
From 5 miles east St. Camille to English Lake.....		14.00
St. John and Quebec Ry.:		
From Fredericton, N.B., south.....		1.24
Total.....		547.47

Outside Canada, the only mileage of new track laid by any of the subsidiaries of Canadian lines, was 8.91 miles by the Minneapolis, St. Paul and Sault Ste. Marie Ry., from Van Hook to Sanish, N.D.

No return has been received from the Canadian Northern Pacific Ry., and we are therefore unaware what track it laid.

Fire in G.T.R. shops.—A fire started in the tube department of the G.T.R. shops at Point St. Charles, Montreal, at noon, Dec. 10, and caused considerable damage to the tube, blacksmith and erecting shops before it was checked. The cause has not been ascertained.

Shell Making at Transcona Shops.—In connection with the press reports stating that the National Transcontinental Ry. shops at Transcona, Man., had been leased to a private company for shell making, we are advised that the Grand Trunk Pacific Ry. had a shell contract, which it was carrying out at the Transcona shops before they were taken over by the Government in connection with the National Transcontinental Ry. The G.T.P.R. was given permission to continue the shellmaking, but has since transferred its contract to the Transcona Shell Co. The Canadian Government Railways supplies light, heat and power on a percentage basis.

Railway Rolling Stock Notes.

The Canadian Northern Ry. has received 7 steel underframe tourist cars from Crossen Car Co.

The Canadian Pacific Ry. will probably change the lighting of some 130 passenger cars to electricity.

The French Government is reported to have ordered 2,000 freight cars from the Canadian Car and Foundry Co.

Canadian Government Railways has received 105 steel flat cars from Nova Scotia Car Works, and 1 consolidation locomotive from Canadian Allis-Chalmers, Ltd.

The Nigerian Ry., West Africa, has ordered through the Crown Agents for the Colonies 100 ten ton end tipping coal wagons from Canadian Car & Foundry Co.

The Canadian Pacific Ry.'s passenger car shops, at Angus, Montreal, are running at full capacity putting passenger equipment in condition to meet the increased business.

The Canadian Northern Ry., during November, received 2 dining cars and 11 sleeping cars from Canadian Car and Foundry Co., and 7 tourist cars from Crossen Car Co.

The Grand Trunk is having 1,500 steel freight cars repaired. The American Car and Foundry Co., Detroit, Mich., is doing the work on 300 cars, with the option of doing the other 1,200.

The Canadian Locomotive Co. has shipped 3 locomotives to the Russian Government. General details of these locomotives were given in a previous issue and a full description appears in this issue.

The Canadian Pacific management is considering the addition of some passenger locomotives. Details of type and number are not yet available, but the order may amount to about 50. Whether they will be built at the company's Angus shops, or ordered outside, has not been announced. Since the foregoing was put in type, a Kingston, Ont., press dispatch states that the C.P.R. has ordered 25 locomotives from the Canadian Locomotive Co.

The Canadian Government Railways, according to an unconfirmed Ottawa press dispatch of Dec. 27, has given "a large order" for locomotives for use principally, if not altogether, on the National Transcontinental Ry. It is also said that the Canadian Government Railways has leased from 30 to 40 Grand Trunk Pacific Ry. locomotives for use on the National Transcontinental. Since the foregoing was put in type, we have been officially advised that 25 locomotives have been ordered from the Canadian Locomotive Co.

The Canadian Pacific is going to build at its Angus shops, Montreal, 1,000 freight cars on replacement account. The details are not yet available, but there will probably be 800 standard box cars and 200 automobile cars. Two hundred freight refrigerator cars and 50 passenger refrigerator cars are also to be built, and there will also be some miscellaneous cars, probably 76 stock, 18 coal, 6 ore and 3 furniture. Some passenger equipment is also being considered, and will probably include the following cars: 12 mail, 1 mail and express, 4 baggage, 1 dining.

The Imperial Oil Co., Ltd., Sarnia, Ont., has ordered 100 tank car underframes and trucks, 80,000 lbs. capacity, and tank trimmings, from National Steel Car Co., and has also ordered 100 from Canadian Car and Foundry Co. The underframes will be composed of heavy 12 in. ship channels with top and bottom cover plates. At the bolsters will be half saddles which will form the side bearing, and at the same time support the tank. The trucks will be of the

Tank mountings will consist of the usual appliances on a steel tank car, comprising running board brackets, tank bands, hand rail piping and fittings, side steps, grab handles, etc. The frames will be equipped with Westinghouse air brakes and friction draft gear. The tanks will be supplied and placed in position by the Imperial Oil Co. at Sarnia.

Progress of Rogers Pass Tunnel Construction. Canadian Pacific Railway.

The following table, for which we are indebted to J. G. Sullivan, M.Can.Soc.C.E., Chief Engineer, C.P.R., Winnipeg, shows the progress made from Oct. 28 to Dec. 2, also the total progress to Dec. 2:

	Progress.	Total.
EAST END.		
Main heading.....	1,129 ft.	11,858 ft.
Main tunnel.....	806 ft.	8,053 ft.
WEST END.		
Main heading.....	783 ft.	11,912 ft.
Main tunnel.....	840 ft.	6,950 ft.

A Glacier, B.C., press dispatch of Dec. 13 says the borings from the east and west ends met at 11.30 that day, giving a continuous passage through the mountain.

Quebec and Saguenay Ry.'s Future.—Ottawa press dispatch Dec. 14.—A number of petitions have been received by the Government from the communities served by the Quebec and Saguenay Ry., an uncompleted line running from the city of Quebec to Murray Bay, to have the road taken over by the Dominion Government. The suggestion is made that with this railway the Government could establish a winter port on the St. Lawrence, either at Murray Bay or beyond. The road has been constructed for from 90 to 100 miles, and is one of the group of enterprises associated with the Quebec Railway, Light, Heat and Power Co. It handles a large tourist as well as a local passenger and freight traffic between Quebec and points in Montmorency and Charlevoix Counties. Government engineers have examined the railway and have reported, and during the past summer a personal inspection of the property was made by the Minister of Railways. No decision has been reached regarding the proposed transfer.

First Aid Work on Grand Trunk Ry.—E. J. Chamberlin, President, has presented a silver shield for annual competition amongst first aid teams on the G.T.R. Elimination contests have been held recently at Montreal, Toronto, Stratford and Battle Creek, in which men representing the various terminals and shops on the line competed. The judge was an expert in first aid work, chosen by the St. John Ambulance Association, and the team receiving the greatest number of marks at each examining point competed in the final competition for the shield. The tests were of a complete character, including handling of the apparently drowned, treatment of wounds, bleeding and poisoning, temporary management of fractures, dislocations, sprains, etc., and methods of transporting injured persons. Women's teams were examined in home nursing instead of stretcher work.

International Engineering Congress.—The proceedings of this Congress, held at San Francisco Sept. 20-25, 1915, will be printed in eleven volumes. Members are entitled to receive the index volume and any other single volume according to choice, and extra volumes can be secured by members at special rates. Persons wishing to become members can still do so by remitting \$5 to W. A. Cattell, Secretary-Treasurer, Foxcroft Building, San Francisco, Cal., but prompt action will be necessary as the membership list will close at a very early date.

The New York, New Haven and Hartford Road and the Grand Trunk Railway.

In the trial of the New Haven and Hartford Rd. directors, proceeding before the Federal Court in New York, C. S. Mellen, formerly President, in the course of his evidence, stated, Dec. 2, that the company spent probably \$120,000 to block the G.T.R.'s proposed extensions into southern New England. The G.T.R. proposed to build a line from a junction with the New London Northern, operated by the Central Vermont Ry., a G.T.R. subsidiary, at Palmer, Mass., to Providence, R.I. An agreement was reached in 1910, with the late C. M. Hays, then President, G.T.R., that if the New London Northern was sold to the N.Y., N.H. & H.R., the latter would transfer the control of the New York, Ontario and Western to the G.T.R. Immediately after that, the G.T.R. announced that it would build from Palmer to Providence, but because it was proposed to use the New Haven facilities in Providence and to eliminate grade crossings, entailing heavy expense on the New Haven, the proposal was opposed in the Rhode Island Legislature. For the collection and dissemination of information tending to show that the G.T.R. was violating obligations to the Dominion Government in building that extension, a further \$50,000 was spent. An additional \$60,000 was spent in opposing another G.T.R. project, viz., the building of a line from White River Jct. to Boston, Mass., and steps were at once taken to extend the Sullivan County Rd., a Boston and Maine subsidiary, to parallel the Central Vermont Ry. After C. M. Hays' death an agreement was arrived at with E. J. Chamberlin, his successor, whereby presumably the G.T.R. was to stop work on the Providence extension in return for trackage rights over the New Haven. Mr. Mellen considered that the Providence extension would never have been profitable, and that it was not designed for legitimate competition, but as a threat. In 1908 the New Haven entered into an agreement with the C.P.R. whereby all the New Haven territory was opened to that company through Newport, Vt., and the Boston and Maine, and he was ready to give the G.T.R. the same advantage, but much more was wanted. In concluding his statement, he said: "The route from New York to Boston by the New Haven, from Boston to Portland by the Boston and Maine, from Portland to Bangor by the Maine Central, and from Bangor to St. John, N.B., by the C.P.R., is the most important military base line in the country. It is a most useful thing to the country at large to have it nearly all under one control."

Pere Marquette Rd. to Be Sold.—Detroit, Mich., press dispatch, Dec. 20: "Judge Tuttle, in United States District Court today, fixed April 5, 1916, as the date for the sale of the P.M.R. to satisfy creditors. The road has been in receivers' hands since 1912. At a previous hearing in July, 1915, Judge Tuttle fixed the upset price at \$14,000,000, subject to the underlying bonds and interests, which it was said would bring the price to approximately \$42,000,000."

Increased Freight Rates to Southwestern United States Points.—The Interstate Commerce Commission decided at Washington, D.C., recently that the proposed increased rates on grain from points on the Great Northern Ry. in Minnesota and South Dakota to points on the Kansas City Southern Ry. in Kansas, Missouri, and Oklahoma and points on the Union Pacific Rd. in Kansas, found are justified, and the order of suspension was vacated.

Track Section Prize Competition on the Canadian Pacific Railway Eastern Lines.

The third annual track section prize competition on the Eastern Lines of the Canadian Pacific Railway has been concluded and 69 prizes have been awarded. The conditions governing the awarding of the prizes were the same this year as in the past, general efficiency being the keynote of a foreman's work. The condition, throughout the season of the ditches, drainage, surface, line, gauge, spiking, bolting, rail wear as controlled by the section forces, switches, sidings, right of way, station grounds, track signs, cattle guards and fences, was given careful consideration. The amount of work done was checked against the hours of labor, both regular and extra, and a standard of merit arrived at, the physical characteristics of the section, grades, alignment, nature of roadbeds, climate, etc., being taken into consideration.

Some idea of the care exercised in judging a foreman's work can be formed by following the work in connection with the selection of a prize section. Toward the end of the season, on each of the 43 roadmasters' territories, a section is picked out as the most deserving in point of work done during the season with the material and labor available. These are carefully inspected by the superintendent and resident engineer who select the best one on each district for inspection by the general superintendent and division engineer. All districts of a division are covered by these two officers, and the section selected which they consider eligible for the General Manager's prize. The judging for the General Manager's prize is done personally by the

General Manager, the Engineer, Maintenance of Way, the Assistant Engineer, Maintenance of Way, and division officers.

The winners of the principal prizes for 1915 are as follows:—General Manager's prize: Foreman F. Patritti, Dorion, Ont., section 16, Nipigon Subdivision, Lake Superior Division. General Superintendent's prizes: Atlantic Division, Foreman M. Phillips, Rooth, N.B., section 10, St. John Subdivision; Eastern Division, Foreman A. McArthur, Apple Hill, Ont., section 13, Smiths' Falls Subdivision. Ontario Division, Foreman W. R. Bradley, Bothwell, Ont., section 9, Windsor Subdivision. Lake Superior Division, Foreman A. Melaire, Heron Bay, Ont., section 11, Schreiber Subdivision.

Western United States Freight Rates Increased.—Washington, D.C., Dec. 23: "Further increases in freight rates were granted the railways in western territory by the Interstate Commerce Commission. Under this decision, which is the third during the past six months granting increases to the western carriers, the railways will be allowed to increase their charges on agricultural implements 2c. per 100 lbs. and on canned goods 1c. per 100 lbs. They were also given permission to increase their rates on boots and shoes. Increases were allowed on dried fruits in portions of the territory, as well as on shipments of flue lining. The carriers were denied permission to increase rates on eggs and on cider and vinegar."

The Great North Western Telegraph Co. has opened offices at Dumblane and Eston, Sask., Carrot, Evansburg and Onoway, Alta., and has closed its offices at Charlesbourg and Reid's Station, Que., Alfred Centre, Beaumaris and Odessa, Ont., and Algar, Man.

The Canadian Pacific Railway's Roll of Honor.

C. H. Buell, Staff Registrar and Secretary, Pension Department, C.P.R., has issued list 7, which is prefixed as follows:—"Several thousand officers and employees of this company enlisted for active military duty with the Canadian Expeditionary Forces, and the majority of them are now in Europe, bravely battling for Canada and the Empire. As particulars of army reservists are not available, these lists of those who have given up their lives for their country, or been wounded in action, are necessarily incomplete, and do not therefore indicate fully the extent to which the Company's officers and employees have participated in the great struggle."

Atton, Richard W.	Checker	Winnipeg	Killed in action
Beach, James W.	Storeman	Winnipeg	Died of wounds
Bennett, W. H. D.	Clerk	Sortin	Wounded
Carr, Percival	Tapeman	Calgary	Wounded
Coombe, Philip	Fitter's helper	North Bay	Wounded
Cowling, W. S.	Loco. fireman	Vancouver	Killed in action
Cummings, Daniel	Brakeman	Cranbrook	Wounded
Dingle, Percy	Stenographer	Regina	Killed in action
Edwards, Wm. J.	Operator	Moosomin	Wounded
Gabbe, A. E. G.	Wiper	Swift Current	Killed in action
Grant, Leonard A.	Messenger	Vancouver	Died of wounds
Gravestock, J. W.	Stenographer	Moose Jaw	Wounded
Jarman, Jas. S.	Machinist	McAdam	Wounded
Logan, Byron G.	Wiper	Moose Jaw	Died of wounds
McKay, James	Checker	Fort William	Gas poisoning
March, William	Loco. fireman	Medicine Hat	Suffering from shock
Moore, James A.	Pumper	Verner	Wounded
Morrison, Wm. C.	Constable	Montreal	Wounded
Paterson, B. M.	Draughtsman	Montreal	Died of wounds
Pavey, Walter G.	Watchman	Shuswap	Wounded
Perodeau, E. D.	Labourer	Calgary	Suffering from shock
Preston, Roy	Fitter	Calgary	Wounded
Richardson, Richard	Porter	Moose Jaw	Wounded
Smylie, Robert	Watchman	Bassano	Wounded
Stage, Joseph B.	Boilermaker	Outlook	Wounded
Stickland, Stanley	Machinist	Angus	Wounded
Taylor, Russell W.	Clerk	Winnipeg	Wounded
Thomson, John	Truck repairer	Vancouver	Killed in action
Townsend, Gordon J.	Constable	Fort William	Wounded
Ward, Walter A.	Clerk	Montreal	Killed in action
Woodward, Frederick	Car repairer	Cranbrook	Wounded
Wootton, Geo. S.	Truck fitter	McAdam	Killed

January, 1916.]

Winter Grain Rate on National Transcontinental Railway to Atlantic Ports.

Ottawa press dispatch, Dec. 24: "A winter grain rate practically as low as the summer rate by water has been declared by the Minister of Railways for the National Transcontinental Ry. The new rate strikes a new low level for the winter movement of wheat between the head of the lakes and tide water. The change will be 6c a bushel between Armstrong, on the National Transcontinental, and Montreal and Quebec. Armstrong is the competitive point corresponding most closely with the rate points of other lines. An important feature of the new arrangement is that Halifax is to have absolutely equal opportunity with other Atlantic ports so far as the wheat traffic is concerned, and will no longer be handicapped by an adverse differential rate. The National Transcontinental, it is expected, will handle 100 cars of grain a day. It is believed that the new low rate will have to be met by competing private roads. Special arrangements are being made by the Railways Department to store the grain which will be carried east over the Transcontinental and the Intercolonial."

"A statement announcing the new rate was issued today as follows: 'On account of the very large amount of grain still in farmers' hands and in country elevators in Western Canada and the terminal elevators at Fort William and Port Arthur taxed to their capacity with what is already stored and in transit, the Canadian Government Railways are completing arrangements, as an emergency measure, in order to enable shipments to continue freely throughout the winter, to move this grain over the Transcontinental Ry. to elevators at Montreal and Quebec on through all rail rates, which will be based approximately on the all water cost from Fort William to Montreal during the summer season, in other words, using the Transcontinental as the all water carrier during the winter. There will be about 5,000,000 bush. elevator capacity for the reception of this grain at Montreal and Quebec, and in order to increase available space many times over arrangements have been made to reshipe as required to winter ports on the Atlantic seaboard. Halifax is also made a common point with other Atlantic seaports. Formerly, a higher rate prevailed to Halifax, but now that the Government Railways control the entire route from shipping points to Halifax they are able to announce a reduction, making Halifax basis of export rates the same as to other Atlantic winter ports.'"

A Quebec Quarry Spur Line Suit.—The right to use a spur line connecting a quarry with the C.P.R. at St. Francis de Sales, Que., was involved in the case of Bellefleur against Labelle, decided in a court at Montreal, Dec. 10. The quarry was originally owned by the defendant, and he still owns part of the land over which the spur line runs. The quarry was sold with the right of using the spur line. The judge held that defendant could not prevent the plaintiff using the line, and awarded \$1,197 for accrued damages.

The Dominion Government and Grain Shipments.—An Ottawa press dispatch, Dec. 20, states that the Dominion Trade and Commerce Department has arranged with James Carruthers & Co., Grain Shippers, to take over the transporting overseas the grain which the Government commandeered recently between the elevators and the seaboard.

Shell Making at National Transcontinental Railway Shops.

We are officially advised that previous to the Dominion Government taking over the National Transcontinental Ry. east of Winnipeg, including the Transcona shops, the Grand Trunk Pacific Ry. had arranged with the Shell Committee at Ottawa for the manufacture of high explosive shells and received contracts to produce 72,000 eighteen pounder shells. The company, previous to the acquisition of the shops by the Government, fitted out a small section of the Transcona shops with a complete outfit of machinery, tools, etc., to manufacture about 200 shells a day. The machinery and appliances were nearly all the property of the G.T.P.R. Not having experience in shell manufacture, naturally it took time to organize a force to enable the company to turn out the complement of shells it considered the shop fitted up was capable of producing 20 hours a day. When the Government took over the actual operation of the shops on July 1, 1915, the company, of course, had no further control over the manufacture of the shells and the conditions under which it would have had to carry out the work would not have been satisfactory to the company. It was then decided to complete the contracts in the G.T.R. shops in the east, but permission to do this was refused, and the plant was sold out to the Transcona Shell Co. Nov. 3, 1915.

Railway Construction in Mexico Contemplated.—The early construction of a large mileage of railways in Mexico is contemplated by the Carranza government, according to statements given out by R. E. Musquiz, inspector of that country's consulates in the United States. The most important construction planned is a 500-mile line from Nuevo Laredo to Piedras Negras, along the Rio Grande, and thence to a connection with the Matamoros-Monterrey Division of the national railways. A 450-mile road from Monclova to the city of Chihuahua, which will traverse a region said to be rich in coal deposits and valuable minerals, is also proposed. Construction will, it is said, be resumed very soon on the Tampico to the city of Mexico cut off, which was being built when the revolutionary troubles commenced.

Safety Appliances Equipment for U. S. Railways.—The Interstate Commerce Commission decided at Washington, D.C., recently, that the time within which common carriers shall make their freight cars conform to the standards of equipment described by the Commission in order of Mar. 31, 1911, be further extended for one year from July 1, 1916. J. Coleman, Superintendent Car Department, and J. Powell, Chief Draughtsman, Motive Power Department, represented the Grand Trunk at the hearing; W. H. Flynn, Superintendent Motive Power, representing the Michigan Central.

Railway Lands Patented.—Letters patent were issued during November covering Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:

Calgary and Edmonton Ry.	322.30
Canadian Northern Ry.	236.27
Canadian Northern Western Ry.	289.35
Canadian Northern Pacific Ry.	134.80
Canadian Pacific Ry. ....	.68
Edmonton, Dunvegan and British Columbia Ry.	13.29
Grand Trunk Pacific Ry.	63.80
Grand Trunk Pacific Branch Lines Co.	6.34
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	3,676.00
Total	4,741.83

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, for Western Lines, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$1,206,100	\$821,000	\$385,100	x\$145,400
Aug.	1,192,800	954,000	238,800	x3,000
Sept.	2,014,600	1,358,000	661,600	1,900
	\$4,413,600	\$3,227,000	\$1,186,600	x\$79,300
Decr.	\$ 658,300	\$ 579,000	\$79,300	.....

x Decrease.
Mileage in operation at Sept. 30, 1915, 4,965, against 4,670 at Sept. 30, 1914.

Commencing with October, the figures show the earnings of the entire system, both eastern and western lines.

	Gross Earnings	Expenses	Net Earnings	Increase
Oct.	\$3,678,500	\$2,421,500	\$1,257,000	\$ 537,800
	\$3,678,500	\$2,421,500	\$1,257,000	\$ 537,800
Incr.	\$1,100,200	\$ 562,400	\$ 537,800	.....

Approximate earnings for November, \$3,535,200, against \$2,228,000 for Nov., 1914, and for three weeks ended Dec. 21, \$2,428,700, against \$1,345,300 for same period 1914.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$7,895,375.47	\$5,094,972.35	\$2,800,403.12	x\$78,042.71
Aug.	8,801,451.52	5,359,176.80	3,442,314.72	79,157.02
Sept.	1,273,165.45	5,527,864.81	4,475,300.64	378,252.25
Oct.	13,433,206.88	6,863,780.29	6,579,434.59	3,258,106.79

	\$40,413,206.88	\$22,845,754.25	\$17,567,452.63	\$2,737,472.35
Incr.			\$2,747,255	.....
Dec.	\$23,597.38	\$3,761,069.73		.....

Approximate earnings for Nov., 1915, \$13,114,000, against \$7,823,000, and for two weeks ended Dec. 14, \$6,101,000, against \$3,473,000 for same period 1914.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings for the G.T.R. (including the Canada Atlantic Ry.), the G.T.W.R. and the D.G.H. & M.R. for October, compared with those for October, 1914:—

	1915.	1914.
Earnings	\$3,591,305	\$3,593,350
Expenses	2,527,500	2,533,100
Net earnings	\$1,063,805	\$ 976,250
	1915.	1914.
Earnings	\$ 781,944	\$ 639,909
Expenses	562,392	602,000
Net earnings	\$ 219,552	\$ 39,900
	1915.	1914.
Earnings	\$ 293,442	\$ 255,100
Expenses	212,887	224,800
Net earnings	\$ 80,555	\$ 30,300

Approximate earnings for Nov., 1915, \$4,190,871, against \$3,770,406 for Nov., 1914, and for two weeks ended Dec. 14, \$2,035,759, against \$1,736,014 for same period 1914.

TRAFFIC RECEIPTS OF THE SYSTEM

Aggregate from Jan. 1 to Nov. 30:—

	1915	1914	Incr.	Decr.
G.T.R.	\$36,085,580	\$38,490,371		\$2,404,791
G.T.W.R.	6,085,046	6,575,654	\$500,892	
D.G.H. & M.R.	2,581,360	2,348,095	233,765	
Totals	\$44,752,486	\$47,409,320		\$2,656,834

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section, 916 miles, for November, 1915, were \$845,168, against \$101,155 for Nov., 1914. The aggregate earnings for five months ended Nov. 30, were \$2,706,726, against \$2,069,000 for same period 1914.

The Grand Trunk Ry. employees at Toronto have appointed a committee of ten to look after the families of former fellow employees now engaged on active service. W. H. Farrell, Terminal Superintendent, is chairman.

Handling of Milling in Transit Grain at Moose Jaw, Saskatoon and Calgary.

Sir Henry L. Drayton, Chief Commissioner, Board of Railway Commissioners, has given the following judgment, concurred in by Commissioner McLean:—

An application has been made by the R. B. McLean Grain Co., Ltd., of Saskatoon, Sask., asking, in effect, that the milling in transit privilege be extended to the government elevator at Saskatoon, Sask. In principle, the application also covers the government elevators at Calgary and Moose Jaw. The present milling in transit, of course, only allows for the one stop off, and the applicants were anxious that an additional stop off be given, which would enable farmers and grain dealers to have their grain treated and weighed at the government elevator and then proceed in the easterly movement at the through rate plus the usual stop over charge, instead of moving at the local rate, the effect of which would be, of course, to practically prevent the additional stop off. The case was heard at the recent sittings in Saskatoon, Calgary and Regina, so that the facts might be developed, although the Board had already held that such a privilege is one which it has no jurisdiction to order, the Board's jurisdiction as to privilege being confined to questions of discrimination. At the conclusion of the last hearing the Board requested the railways to take up the question with a view of providing a remedy, and W. B. Lanigan, Assistant Freight Traffic Manager, C.P.R., has now written stating that the Railways have arrived at the following, which they believe to be the only practical solution:

"Grain stored in transit in Dominion Government interior elevators at Calgary, Moose Jaw, and Saskatoon, and forwarded under transit regulations, will be granted an additional stop off at any intermediate milling point for grinding only, in the direct line of transit to Winnipeg or Fort William, or points east thereof. An equivalent tonnage of the product thereof, when forwarded within a period of six months after receipt, may be waybilled at the balance of the through rate from such interior elevator point to destination after deducting the rate paid from the government elevator point to the milling point, plus 1c. per 100 lbs. for the additional stop off."

I do not know that the solution requires any confirmation by the Board. It will, however, enable the business to obtain the two stop overs desired. The arrangement appears fair and equitable, and should be approved.

Steel Rail Orders Placed.

The Canadian Pacific will, during next year, lay 30,000 tons of new 85-lb. steel rails at various points over the system. Of these, 5,000 tons were rolled some little time ago by the Algoma Steel Corporation, at Sault Ste. Marie, Mich., and are now being delivered. In addition to this, the same mills have an order for 25,000 tons, to be delivered 5,000 tons a month during May, June, July, August and September.

The Grand Trunk has ordered 20,000 tons of 90 and 100-lb. A. C. A. type, A section from the Algoma Steel Corporation, to be delivered 5,000 tons a month during June, July, September and October.

Western Canada Railway Club.—At the monthly meeting at Winnipeg, Dec. 14, W. C. Blake, chief clerk to General Auditor, Canadian Northern Ry., read a paper on the audit department in relationship to railway organization.

Eastern Live Stock Case Decided by Interstate Commerce Commission.

The Interstate Commerce Commission gave a decision at Washington, D.C., Dec. 2, of which the following is the official summary:

Proposed increased rates for transportation of live stock, except horses and mules, in Central Freight Association territory, found justified to the extent found reasonable in this report.

Certain proposed increased carload minima applicable to live stock when transported between points in Central Freight Association territory, found justified; others not justified.

Proposed increased rates for transportation of cattle from points in Central Freight Association territory to points in trunk line and New England Freight Association territories, found justified.

Proposed increased rates for transportation of hogs and of sheep or goats in single deck and double deck cars from points in Central Freight Association territory to points in trunk line and New England Freight Association territories, found justified.

Certain proposed increased carload minima applicable to live stock when transported from points in Central Freight Association territory to points in trunk line and New England Freight Association territories, found justified; others not justified.

Increased rates for transportation of packing house products, packed, and packing house products, loose, from points in Central Freight Association territory to points in trunk line and New England Freight Association territories, which would exceed the classification rates on these commodities, found not justified.

Proposed increased rates for transportation of fresh meat from points in Central Freight Association territory to points in trunk line and New England Freight Association territories, found justified.

Proposed increased carload minima applicable to fresh meat and packing house products, loose, when transported from points in Central Freight Association territory to points in trunk line and New England Freight Association territories, found justified.

Proposed increased rates for transportation of live stock between points in trunk line territory east of the western termini of the trunk lines, found not justified.

Proposed increased rates for transportation of packing house products between points in trunk line territory east of the western termini of the trunk lines, found not justified.

Proposed increased carload minima applicable to live stock and packing house products, when transported between points in trunk line territory east of the western termini of the trunk lines, found not justified.

Sleeping Car Conveniences.—The Canadian Northern Ry. some time ago provided its sleeping cars with combination clothes hangers. The Pullman sleeping cars operating on the Grand Trunk have been similarly equipped.

The Board of Railway Commissioners and the Quebec Public Utilities Commission sat jointly at Montreal, Dec. 20, to consider the Montreal Electric Commission's application for approval of its plans for the construction of underground conduits in Montreal, sections 6 and 7. Previous applications were made to the Board of Railway Commissioners alone, but this joint sitting was arranged to do away with any possibility of an appeal on the ground of jurisdiction.

Increase in Passenger Fares in Western United States Territory.

The Interstate Commerce Commission, after consideration of proposed increases in passenger fares in western territory, gave a decision, Dec. 7, of which the following is the official abstract:

In the states of Illinois; Wisconsin; Michigan, upper peninsula; Minnesota; Iowa; Nebraska; Missouri, north of the Missouri River; and in Kansas on and north of the main line of the Union Pacific Rd. from Kansas City to the Colorado state line, proposed increased fares not justified, but a basis for interstate fares of 2.4c. a mile is justified.

In the state of Missouri south of the Missouri River, and in the state of Kansas south of the main line of the Union Pacific Rd., proposed increased fares not justified, but a basis for interstate fares of 2.6c. a mile is justified.

Proposed increased fares from points in territory in which these fares are authorized to points on the main lines of these respondent carriers in California, Utah, Nevada, Colorado, Wyoming, Arizona, New Mexico, Arkansas, Oklahoma, and Texas are not justified in those instances where such proposed increases result in higher fares than would be obtained by using for the construction of such fares the bases herein authorized in the states of Michigan, Illinois, Wisconsin, Kansas, Minnesota, Iowa, Nebraska, and Missouri, and a basis of 2½c. a mile in the states of North and South Dakota, and a basis of 3c. a mile in the states south and west thereof.

Proposed increase charges for mileage tickets in territory north of the Missouri River in Missouri and on and north of the main line of the Union Pacific Rd. in Kansas to 2¼c. a mile, and in territory south of the Missouri River in Missouri and the main line of the Union Pacific Rd. in Kansas to 2½c. a mile are justified.

Proposed increased fares from points in Michigan, upper peninsula; Illinois; Iowa; Minnesota; Wisconsin; Nebraska; Missouri; and Kansas, to points in states east thereof, which result from the construction of such fares by the use of the bases herein found reasonable and the use of the lawfully published and filed fares in eastern territory are justified.

Theft from the G.T.R. at Toronto.—W. A. Mason, a G.T.R. ticket agent, who pleaded not guilty recently to a charge of theft of \$1,500 from the G.T.R., in connection with cash received on the sale of tickets, withdrew his plea at Toronto, Dec. 17, and pleaded guilty. His counsel asked for an adjournment of the case to enable restitution to be made. Sentence was postponed until the end of the court sittings, and in the meantime he was allowed liberty on \$3,000 bail.

Hastings St. Viaduct, Vancouver.—The building of this viaduct was ordered by the Board of Railway Commissioners on the Vancouver City Council's application, the Great Northern Ry. being ordered to pay 50% of the cost. The railway company owns certain properties in the vicinity, and not only claims to be exempt from being taxed to meet the city's portion of the cost of the viaduct, but has put in a claim for compensation for alleged damages to its property by the building of the viaduct.

C.P.R. Land Sales.—During November, 2,193 acres in Alberta were disposed of through the Edmonton office. The land was taken up by 14 persons, the majority of whom came from British Columbia and Montana.

January, 1916.]

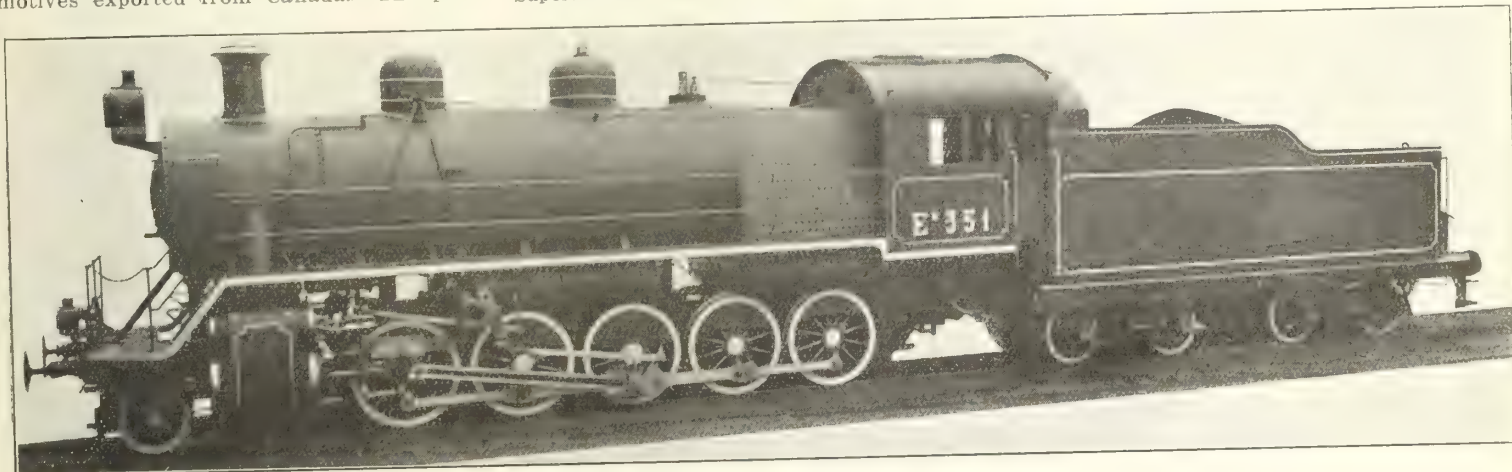
Canadian Built Locomotives for Russian Imperial Railways.

The Russian Imperial Railways are having 50 decapod type locomotives built by the Canadian Locomotive Co. at Kingston, Ont., the first lot of which have already been shipped. These locomotives are of interest, not only because of their design, which is a combination of Russian and American practice, but because of their being the first locomotives exported from Canada. The prin-

Boiler	Straight
Working pressure	180 lbs. per sq. in.
Outside diameter of first ring	70 in.
Firebox, length and width	108½ in. by 86 in.
Tubes, number and outside diameter	195-2 in.
Flues, number and outside diameter	28-5½ in.
Tube and flues, length	17 ft.
Heating surface, tubes and flues	2,393 sq. ft.
Heating surface, firebox (including arch tubes)	208 sq. ft.
Heating surface, total	2,601 sq. ft.
Superheater heating surface	563 sq. ft.

ready built by American locomotive builders.

The fuel used is a low grade of soft coal and is burned on a rocking four sections grate with two dump bars. The firebox is of the wide type extending out and over the driving wheels, and is also equipped with a security brick arch supported on water tubes. The boiler is of the straight type, with a mud ring made up with cast steel ends, and forged steel sides welded together. An auxiliary safety valve dome is provided, which carries 2 safety valves



Decapod Locomotive for Russian Imperial Railways.

cipal dimensions of the locomotives and tenders are as follows:

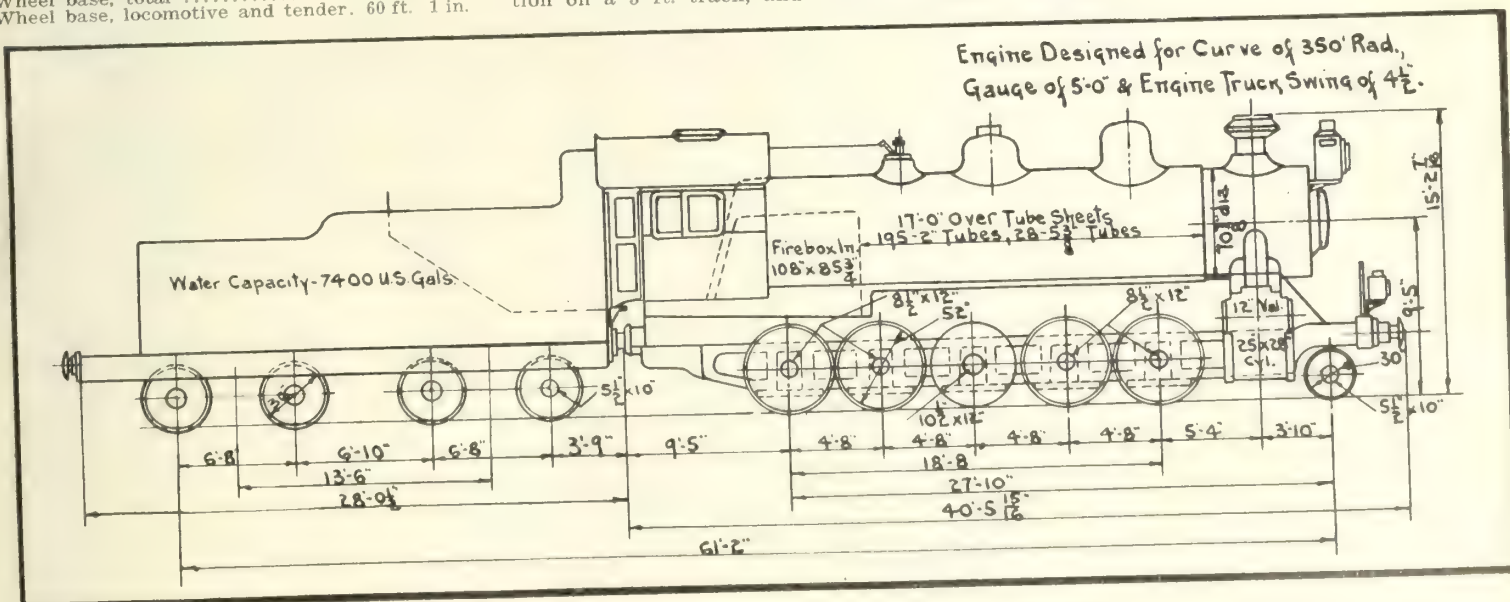
Gauge	5 ft.
Service	Freight
Fuel	Soft coal
Tractive effort	51,500 lbs.
Weight in working order	192,000 lbs.
Weight on drivers	172,000 lbs.
Weight on leading trucks	20,000 lbs.
Weight on locomotive and tender in working order	132,000 lbs.
Wheel base, driving	18 ft. 8 ins.
Wheel base, total	27 ft. 10 ins.
Wheel base, locomotive and tender	60 ft. 1 in.

Equivalent heating surface*	3,446 sq. ft.
Grate area	64.5 sq. ft.
Tender tank	Water bottom
Tender frame	Channel
Tender wheels, diameter	36 in.
Tender journals, diameter and length	5½ in. by 10 in.
Tender water capacity	7,400 gal.
Tender coal capacity	8 metric tons
*Equivalent heating surface equals total evaporative heating surface plus 1.5 times the superheating surface.	

The locomotives are designed for operation on a 5 ft. track, and which is largely

and the whistle. This dome is also used as an inspection dome. A third safety valve is applied to the cover of the main steam dome.

The firebox is of copper, as also are the staybolts used in the water legs. The front end of the firebox is supported by 3 rows of expansion stays, the nut on the upper end of the radial stay is seated in a die forged stirrup, which is screwed into the roof-sheet.



Details of Decapod Locomotive for Russian Imperial Railways.

Ratio, weight on drivers, divided by tractive effort	3.31
Ratio, total weight, divided by tractive effort	3.73
Ratio, tractive effort x diam. drivers, divided by equivalent heating surface	7.89
Ratio, equivalent heating surface, divided by grate area	53.4
Cylinders	Simple
Diameter and stroke	25 in. by 28 in.
Valves	Piston
Diameter	12 in.
Wheels, driving, diameter over tires	52 in.
Wheels, driving journals, main, diameter and length	10½ in. by 12 in.
Wheels, driving journals, others, diameter and length	8½ in. by 12 in.

used as the standard gauge by the Russian railways. The axle loads are limited to 35,000 lbs. per axle, but engines are of considerable capacity, having a tractive effort of 51,500 lbs. (at 85% boiler pressure). They are designed to haul 1,000 metric tons up a grade 0.8% at a speed of about 10 miles an hour. Special material and equipment have been used to a great extent in these locomotives, and the construction is in accordance with the best American practice, many of the details are interchangeable with the locomotives of the same type and size al-

The locomotives are equipped with Schmidt superheater and outside steam pipes; superheaters have 28 elements with a superheater surface of 563 sq. ft. Forty nine are equipped with the Rushton power screw reverse gear, and the Casey-Cavin screw reverse gear is to be applied to the remaining one, both gears being operated by air.

The machinery, frames and cylinders are designed after American practice. The pistons are solid rolled steel with three cast iron packing rings sprung in, and are sup-

ported by an extension on the piston rod with a guide attached to the front cylinder head. The cylinder heads are of cast steel, single bar guides of I section being used. The main driving wheels have plain tires, while all the others are flanged, and the wheel base is such that the locomotive will traverse a curve of 350 ft. radius.

The locomotives are fitted with a wide running board of steel plate, diamond tread, having a handrail around the edges and continuing around the front deck plate in accordance with the Russian railway practice.

The cab is of steel, with side doors, the front end of tender is enclosed with a hood projecting under the cab of engine protecting the crew from the weather. The couplers are of the hook and screwed type of the European practice, as are also the spring buffers. Russian-Westinghouse automatic air brakes are used, along with the special design of the American Brake Co.'s foundation brake. A plug type of by-pass valve is fitted to the cylinder and operated by a cam attached to the throttle lever, which in turn opens a globe valve allowing steam to pass to a small cylinder closing the by-pass. When steam is shut off a tension spring operates the opening of the by-pass.

The tender is carried on two four wheeled trucks of the arch bar type with solid rolled steel wheels. The bearing and boxes are of the M.C.B. type, tender frame is of steel construction, made up of heavy 10 and 12 in. channels, with built up pressed steel bolsters.

After the locomotives have been erected and tested by running on a specially prepared track by the builders, the locomotives and tenders are dismantled, crated and packed for shipment to Vladivostock, Russia.

The United States Government and the Railways.—Commenting on President Wilson's recent message to Congress, the Engineering News says:—"Though his language is carefully guarded, it seems evident that the President at the end of his address was pleading for a cessation of antirailway legislation. He does not say that the railways have been persecuted, he does not antagonize the radical element that has mercilessly persecuted the carriers; he pleads only for fairness, a study of the whole problem 'in the full light of a fresh assessment of circumstance and opinion.' He asks that a commission be appointed to investigate the railway situation and that legislation await its conclusions. In theory, no one could differ with this proposal. In practice one despairs of any good result, not only because the problem is so tremendous, but because any such commission appointed through Government agencies is sure to be overloaded with theorists. Practical railway men seem to be taboo as advisers of the Government in its dealings with the railways."

Union Station for St. Paul, Minn.—The plan submitted by the united railways to the city and Federal Government has been withdrawn in its entirety, following the rejection of the harbor details of the scheme by the Chief of Engineers, U.S.A. The plans were drawn under an act of Congress providing for the bettering of river navigation and river transportation facilities at St. Paul, the harbor line and river being moved a maximum of 400 ft. for 6,000 lin. ft. The U.S. engineers declined to approve the plans on grounds which to the railway companies seemed fundamental, and new plans will be drawn which will not require the approval of the Federal Government. This will mean the selection of a new site and the purchase of grounds.

Railway Finance, Meetings, Etc.

The Algoma Central and Hudson Bay Ry. Co. and the receivers—T. J. Kennedy and V. Harcourt—are applying to the Dominion Parliament for the confirmation of the sale of certain lands for terminal purposes at Sault Ste Marie and Michipicoten Harbor, Ont., to the Algoma Central Terminals; for the confirmation of the lease of terminal properties by the A.C. Terminals to the A. C. and H.B. Ry., and for the confirmation of an agreement for the reorganization of the A.C. and H.B. Ry., and the adjustment of the relations between the two companies, and authorizing all the parties interested to give full effect to the terms of the agreement.

Canada Southern Ry.—A meeting of shareholders was called for Dec. 30, to consider an agreement for the sale to the C.S. R. of all the property, buildings and rights of the London and South Eastern Ry. in London, Ont., considering an agreement between the London Railway Commission and the Michigan Central Rd., as lessees of the C.S. Ry., for hauling by the L.R.C. of the freight traffic of the M.C.R., over the L. & S.E.R. tracks and terminals in London and the L. and P.S. Ry. tracks between St. Thomas and London; and to consider an agreement between the Toronto, Hamilton and Buffalo Ry., the Michigan Central Rd., the Canada Southern Ry., the New York Central Rd., and the Canadian Pacific Ry., in relation to the proposed issue of Toronto, Hamilton and Buffalo Ry. consolidated first mortgage bonds.

Canadian Pacific Ry.—The Dominion Parliament is being asked to amend and extend the company's powers in respect of the issuance of preferred shares now or hereafter issued by the conversion thereof into denominations of Canadian currency.

Essex Terminal Ry.—The officers for the current year are:—F. C. McMath, President; Wm. Woollatt, Vice President and General Manager; J. H. Coburn, Secretary and Solicitor; C. F. Doherty, Treasurer; F. B. Thompson, Auditor.

Ottawa and New York Ry.—St. Lawrence and Adirondack Ry.—Duplicate originals of the leases of these two railways, dated Sept. 27, 1915, were deposited with the Secretary of State for Canada, Dec. 11.

White Pass and Yukon Route.—Gross earnings for ten months ended Oct. 31, 1915, \$1,449,383, against \$1,415,149 for same period 1914.

Alleged Plot to Destroy C.P.R. Property.—It is reported from the Pacific Coast that an organized conspiracy has been unearthed in San Francisco and British Columbia, in which the German Consul at San Francisco, and other Germans are implicated, to destroy certain munition plants, and portions of the C.P.R. It is stated that a man of German birth, at present stated to be serving a two years imprisonment at Calgary, Alta., for forgery, was used by C.P.R. officials to gain evidence, and this man in an affidavit, credited F. W. Peters, General Superintendent, British Columbia Division, W. C. Orchard and — Tweedale, of the C.P.R., with assisting in the discovery.

The Lehigh Valley Rd's New Freight Terminal at Buffalo, N.Y., which was formally opened Dec. 15 consists of a team track yard and 2 buildings—a 2 story office building, 111 x 60 ft., and a fireproof shed, 700 x 60 ft. The office building contains two storage rooms, one for damaged shipments and the other for perishable freight. Of the 700 ft. length of the shed, 600 ft. is taken up by floor space. There are three sections which have fireproof walls, with doors protected by automatic fireproof steel curtains.

Grain in Store at Terminal Elevators, Interior Terminal Elevators and at Public Elevators in the East.

Week ending Dec. 10, 1915.	Wheat, bushels.	Oats, bushels.	Barley, bushels.	Flax, bushels.	Totals, bushels.
Port William—					
C.P.R.	1,227,541	570,488	214,012	24	2,012,065
Consolidated Elevator Co.	650,160	199,953	44,560	53,180	947,853
Empire Elevator Co.	471,487	139,964	78,411	116,205	806,067
Ogilvie Flour Mills Co.	509,556	41,981	29,569	.....	581,106
Western Terminal Elevator Co.	576,681	100,399	29,222	87,626	793,928
G.T. Pacific	1,371,122	536,218	67,534	64,181	2,039,055
Grain Growers' Grain Co.	659,703	305,397	113,974	.....	1,079,074
Port William Elevator Co.	215,237	222,602	38,977	45,966	522,782
Eastern Terminal Elevator Co.	234,005	111,536	32,894	.....	378,435
Port Arthur—					
Port Arthur Elevator Co.	1,346,721	575,116	171,166	82,794	2,175,797
D. Horn & Co.	121,744	39,281	20,867	74,599	256,491
Dominion Government Elevator ..	528,905	469,000	66,084	51,317	1,115,306
Grain afloat .....	.....	.....	.....	.....	.....
Total Terminal Elevators	7,912,862	3,311,935	907,290	575,892	12,707,959
Calgary Dom. Govt. Elevator	19,853	40,637	1,731	.....	62,221
Saskatoon Dom. Govt. Elevator ...	580,304	25,265	.....	7,811	613,380
Moosejaw Dom. Govt. Elevator ...	33,327	7,990	344	3,781	45,442
Total Interior Term'l Elevators ..	633,484	73,892	2,075	11,592	721,043
Depot Harbor	456,866	38,000	.....	.....	494,866
Midland—					
Aberdeen Elevator Co.	350,868	.....	.....	.....	350,868
Midland Elevator Co.	409,027	226,229	47,660	.....	682,916
Tiffin, G.T.P.	1,181,006	930,863	281,213	.....	2,393,082
Port McNicoll	2,699,483	1,228,507	57,682	13,813	3,999,485
Collingwood	41	.....	.....	*947	988
Goderich	764,222	107,000	.....	.....	871,222
Kingston—					
Montreal Transportation Co. ....	.....	147,682	.....	.....	147,682
Commercial Elevator Co. ....	.....	.....	.....	.....	.....
Port Colborne	900,490	563,969	.....	8,920	1,473,379
Prescott .....	.....	.....	.....	.....	.....
Montreal—					
Harbor Commissioners No. 1	740,083	.....	.....	.....	740,083
Harbor Commissioners No. 2	315,647	751,074	17,965	.....	1,084,686
Montreal Warehousing Co.	1,155	1,411,157	.....	.....	1,412,312
Quebec Harbor Commissioners	3,509	4,923	.....	.....	8,432
West St. John, N.B.	149,260	291,319	16,647	.....	457,226
Halifax, N.S. ....	.....	.....	.....	.....	.....
Total Public Elevators	7,971,657	5,700,723	421,167	22,733	14,117,227
Total Quantity in Store	16,518,003	9,086,550	1,330,512	610,217	27,546,229
*Corn.					

January, 1916.]

Canadian Railway AND Marine World

ESTABLISHED 1898

Devoted to Steam and Electric Railway,
Marine, Express, Telegraph, and Railway and
Canal Contractors' Interests.
Official Organ of the various Canadian
Transportation Associations.
Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C.E.,
Managing Director and Editor-in-Chief.
AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editor - **JOHN KEIR**
Associate Editor - **DONALD F. KEIR**
Mechanical Editor - **FREDERICK H. MOODY, B.A.S.**

Canadian Business Representative - **W. H. HEWITT**
70 Bond Street, Toronto

United States Business Representative, **A. FENTON WALKER**
143 Liberty Street, New York, N.Y.

European Business Representative - **J. MEREDITH McKIM**
16 Regent St., London, S.W., Eng.

Authorized by the Postmaster General for
Canada, for transmission as second class mat-
ter.

Entered as second class matter, July 25, 1913,
at the Postoffice at Buffalo, N.Y., under the
Act of Congress of March 3, 1879.

SUBSCRIPTION PRICE, including postage
anywhere, \$2 a year.

SINGLE COPIES, 20 cents each, including
postage.

The best and safest way to remit is by express
money order. Where one cannot be obtained, a
post office money order, or bank draft, payable
at par in Toronto, may be sent. Cheques or
drafts not payable at par in Toronto cannot be
accepted. Remittances should be made payable
to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on applica-
tion.

ADVERTISING COPY must reach the pub-
lishers by the 10th of the month preceding the
date of publication.

TORONTO, CANADA, JANUARY, 1916.

PRINCIPAL CONTENTS.

Appointments, Transportation	22
Birthdays of Transportation Men	6
Board of Railway Commissioners, —	
Orders by, Summaries of	8
Traffic Orders	11
Canadian Northern Ry., Construction	12
Riviere-des-Prairies Bridge	2
Canadian Pacific Ry., Rogers Pass Tunnel	
Progress	15
Roll of Honor	16
Track Section Prize Competition	16
Tail Windbreaks	8
Electric Railway Department	21 to 32
Answers to Questions on Electric Railway	
Topics	31
Finance, Meetings, Etc.	31
Hydro Electric Railway, Toronto to Lon-	
don	27
Jitney Situation in Canada	28
Projects, Construction, Etc.	30
Three Rivers Traction Co.	28
Toronto, Radial Entrances and Rapid	
Transit	24
Track Laid in 1915	29
Grain in Store at Terminal Elevators	5
Great Northern Ry. Report	
Locomotive Driving Wheel, Relation be-	
tween Tractive Effort and Adhesive	
Weight	5
Mainly About Railway People	13
Marine Department	33 to 40
Canadian Atlantic Ocean Mail Port	35
Intercolonial Ry. Car Ferry Scotia	34
Personal	39
Sault Ste. Marie Canals Traffic	38
Vessels Registered	37
New York, New Haven and Hartford Rd.	
and C.T.R.	16
Pacific Great Eastern Ry. Annual Meeting.	
Railway Development	10
Railway Earnings	17
Railway Finance, Meetings, Etc.	20
Railway Freight Statistics	8
Railway Mechanical Methods and Devices ..	1
Railway Rolling Stock Notes	15
Railway Track Laid in 1915	15
Russian Imperial Railways, Canadian Loco-	
motives	19
Tie Renewals and Distribution	6
Welland Ship Canal Construction Railway.	

The Unmistakable Return of Canada's Business Prosperity.

One of the most reliable barometers of general business conditions is undoubtedly railway earnings, which clearly indicate the state of trade. In the latter half of 1914, consequent on an unsatisfactory crop in the prairie provinces, and on the dislocation caused by war, Canadian railway receipts fell off at an alarming rate, and for the year ended June 30, 1915, Canadian Pacific net earnings were \$8,851,300 less than in the previous 12 months. Other lines also showed similarly heavy decreases. But shortly after the commencement of the C.P.R.'s current fiscal year the tide turned. For the first month, July 1915, there was a decrease from July 1914 of \$978,042.71 in net earnings, but in August there was an increase of \$79,157.02, in September of \$378,252.25, in October of \$3,258,105.79, and in November of \$3,710,340.86. For the four months ended Oct. 31 the increase in net earnings over the corresponding period was \$2,737,472.35. Indisputable evidence of the remarkable manner in which the management grappled with the situation, created by falling revenues in the latter part of last year and the early part of this year, is shown by the way in which working expenses have been cut down. While for the first four months of this fiscal year gross earnings decreased \$23,597.38, working expenses decreased no less than \$2,761,069.73, thus giving an increase of \$2,737,472.35 in net profits. For the five months ended Nov. 30, the increase in net profits was \$6,447,813.21, working expenses having been decreased \$1,177,485.97 during that period. December will also show up well, the approximate traffic earnings from Dec. 1 to 7 having increased \$1,280,000, from Dec. 7 to 14 \$1,348,000, and from Dec. 14 to 21, \$1,341,000.

The Canadian Northern earnings cannot be dealt with as fully, as on Oct. 1 it started to give out its figures for the whole system, instead of west of Lake Superior as previously, and no comparisons are available prior to that date. For October the increase in net earnings was \$537,800, and for November \$618,400, a total of \$1,156,200 for the two months.

The Grand Trunk and the Grand Trunk Pacific are also showing satisfactory increases, details of which appear on another page among the statements of railway earnings. The Intercolonial figures are not given out until the end of the fiscal year, but it is said that its earnings for the past four months have broken all records.

October was a remarkable month, the gross earnings of the three principal railways, Canadian Pacific, Canadian Northern, and Grand Trunk, being \$21,654,191, against \$16,134,717 in Oct. 1914, an increase of \$5,519,474 or over 34%. There is only one month in Canada's railway history when the combined gross earnings of the three lines exceeded Oct. 1915, viz., Oct. 1913, when the stringent conditions in the west made the farmers market early and the month's gross earnings were \$22,090,000.

While much of the increase in railway earnings, particularly those of the C.P.R. and Canadian Northern, is attributable largely to the magnificent grain crop in the prairie provinces, a good deal of it comes from the general improvement in business throughout the country.

The official estimate of Canada's 1915 wheat crop is 336,258,000 bushels, of which there will be an exportable surplus of nearly 230,000,000.

Two of Canada's highest agricultural authorities, after careful study of the field crops for Canada for 1915, estimated their

value in excess of 1914 at \$250,000,000.

The exports from Canada during Nov. 1915 were about \$92,000,000, or nearly double those of Nov. 1914. The exports for the eight months ended Nov. 30, 1915 were \$863,000,000, against \$766,000,000 for the corresponding period of the previous fiscal year.

Canada's bank clearings for Nov. 1915, \$891,284,701, not only exceeded those of any other November on record, but were the largest ever reported for any month. They were 13% over Oct. 1915, 38% over Nov. 1914, and 5% over Nov. 1913.

The Canadian banks' October statements show an increase of deposits of \$41,000,000 over Sept. 1915 and of \$85,000,000 over Sept. 1914.

Canada's revenue for eight months to Nov. 30, 1915, was \$104,750,000 against \$90,400,000 for the corresponding period of the previous fiscal year.

The facts given above are full of significance, and present unmistakable evidence of a tremendous revival in business conditions throughout the Dominion generally.

Canadian Ambulance Train for Overseas Service?

A cablegram from the Montreal Star's London, Eng., correspondent, Dec. 14, said: Arrangements are practically completed for the Canadian ambulance train built in Canada for service on the western front by a large railway corporation, which, it is reported, will practically donate specially built cars, and several patriotic associations in the Dominion will fit it out complete even to the tail lamps. It has been suggested to me also that a Canadian built engine, specially built to the different gauge of the French lines, be sent over. An all Canadian train, which is the idea of Lady Brooke, will make the Dominion represented in every department of army medical work in France."

Enquiry of the three leading Canadian railways, and of the Railways Department at Ottawa, have failed to elicit any confirmation of the cablegram quoted above.

The late Sir Wm. Whyte's portrait, life size, presented by his family to the Winnipeg School Board, was unveiled at the William Whyte School, one of the new schools in Winnipeg, on Dec. 23, by A. M. Nanton, one of the C.P.R. directors, and Vice President, Winnipeg Electric Ry., who was one of his closest friends. A large number of representative citizens were present, including members of the school board, C.P.R. officials and representatives of the various railway employees' brotherhoods.

Thos. L. Wilson, of Ottawa, Ont., who died in New York, Dec. 21, aged 55, was chiefly known by his patented processes in connection with the manufacture of carbide, and the use of acetylene gas, particularly of marine buoy lighting.

The Dominion Ex. Co. was charged at Moncton, N.B., Dec. 14, with a first offence in violation of the Canada Temperance Act, in carrying intoxicating liquors into prohibition territory. The magistrate, in dismissing the case, said that there was no intention on the part of the company to violate the law. In referring to the "personal use" clause of the act, he said that there would be trouble over shipments so long as that clause remained. He would make no order for the disposition of the liquor seized, as he believed that it was illegally in court, having been seized without a search warrant.

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canadian Government Railways.—F. W. ROBERTSON has been appointed District Passenger Agent, Halifax, N.S., vice D. M. Condon, assigned to other duties in the head office, Moncton, N.B.

(See also Intercolonial Ry., and National Transcontinental Ry.).

Canadian Northern Ry.—JAMES W. JOHNSON, heretofore Assistant Electrician, Western Lines, Winnipeg, has been appointed Electrician, Eastern Lines. Office, Toronto.

The organization of the Mechanical Department, Ontario Division, is now as follows:—

J. H. McALPINE, heretofore District Master Mechanic, Parry Sound, Ont., has been appointed Master Mechanic. Office, Toronto.

W. C. MOORE, heretofore District Master Mechanic, Trenton, Ont., has been appointed Assistant Master Mechanic. Office, Toronto.

R. A. MILLER, heretofore General Foreman, Trenton, Ont., has been appointed Locomotive Foreman, there.

W. H. LONG, Car Foreman, Trenton, Ont. S. L. TRACEY has been appointed Locomotive Foreman, Toronto.

W. F. MILLER, heretofore Car Foreman, Parry Sound, Ont., has been appointed Car Foreman, Toronto.

J. H. THOMPSON has been appointed Locomotive Foreman, Ottawa, Ont.

T. REDMOND has been appointed Car Foreman, Ottawa, Ont.

A. A. TAGGART, Locomotive Foreman, Brockville, Ont.

J. WEBB has been appointed Locomotive Foreman, Bancroft, Ont.

O. C. GRANT has been appointed Locomotive Foreman, Parry Sound, Ont.

A. FOURNIER has been appointed Locomotive Foreman, Sudbury, Ont.

A. MALLINSON, heretofore machinist, Ogden Shops, C.P.R., Calgary, Alta., has been appointed Locomotive Foreman, Capreol, Ont.

C. T. DOCTOR has been appointed Locomotive Foreman, Foleyette, Ont.

J. H. WILSON has been appointed Locomotive Foreman, Hornepayne, Ont.

G. CANFIELD has been appointed Locomotive Foreman, Jellicoe, Ont.

The Master Mechanic to the General Superintendent in respect to transportation matters and to the Superintendent Rolling Stock in respect to shop operations, maintenance of equipment, etc.

A. H. MANSFIELD, heretofore Chief Dispatcher, C.P.R., Brandon, Man., has been appointed Chief Dispatcher, District 1, Central Division, C.N.R., vice T. J. Brown, whose appointment as Superintendent, District 2, Western Division, Saskatoon, Sask., was announced in our last issue. Office, Port Arthur, Ont.

G. A. NORTH, heretofore Passenger Agent, Brandon, Man., has been appointed Travelling Passenger Agent, Winnipeg, vice J. F. McGuire, transferred.

E. H. DREW has been appointed Inspector of Sleeping and Dining Cars, Winnipeg.

C. N. JONES, heretofore Inspector in charge of linen room, Sleeping, Dining and Parlor Cars and News Service, Winnipeg, has been appointed Assistant Storekeeper, main storeroom, same department, Winnipeg.

A. PATRICK has been appointed Inspector

in charge of linen room, Sleeping, Dining and Parlor Car and News Department, vice C. N. Jones, transferred. Office, Winnipeg.

D. MAIN has been appointed Assistant Car Foreman, Winnipeg, vice A. Grey, transferred.

A. TAYLOR has been appointed Night Locomotive Foreman, Winnipeg, vice J. Black, transferred.

J. DUNCANSON has been appointed Assistant Locomotive Foreman, Winnipeg, vice A. Mays, Shop Foreman, transferred.

R. M. MILLIKEN, heretofore City Freight Agent, Winnipeg, Man., has been appointed District Freight Agent, Brandon, Man., vice R. B. McIntosh.

E. C. DICKERSON, heretofore in Union Station ticket office, Regina, Sask., has been appointed Passenger Agent, Brandon, Man., vice G. A. North, promoted.

J. HERRING has been appointed Car Foreman, North Battleford, Sask., vice A. H. Sweetman, transferred.

J. BLACK, heretofore Assistant Locomotive Foreman, Kamsack, Sask., has been appointed Locomotive Foreman there, vice S. Vincent, transferred.

A. MAYS, heretofore Shop Foreman, Winnipeg, has been appointed Locomotive Foreman, Edmonton, Alta., vice W. M. Armstrong, transferred.

G. H. CULLINGFORD has been appointed Sleeping and Dining Car Agent, Edmonton, Alta.

M. A. CARDELL, heretofore in the Construction Department, has been appointed Locomotive Foreman, Tollerton, Alta.

G. CLARK, heretofore coach carpenter, Winnipeg, has been appointed Car Foreman, Tollerton, Alta.

D. R. CAMPBELL, whose appointment as General Superintendent, Pacific Division, was announced in our last issue, has been appointed Assistant General Manager, Pacific Division, Lines West of Tollerton, Alta. Office, Vancouver, B.C.

T. YOUNG, heretofore in the Construction Department, has been appointed Locomotive Foreman, Lucerne, B.C.

A. GREY, heretofore Assistant Car Foreman, Winnipeg, has been appointed Car Foreman, Lucerne, B.C.

H. N. LUKES, heretofore Assistant Air Brake Inspector, has been appointed Locomotive Foreman, Blue River, B.C.

S. VINCENT, heretofore Locomotive Foreman, Kamsack, Sask., has been appointed Locomotive Foreman, Kamloops, B.C.

A. H. SWEETMAN, heretofore Car Foreman, North Battleford, Sask., has been appointed Car Foreman, Kamloops, B.C.

S. HICKS, heretofore Locomotive Foreman, Portage la Prairie, Man., has been appointed Locomotive Foreman, Boston Bar, B.C.

W. M. ARMSTRONG, heretofore Locomotive Foreman, Edmonton, Alta., has been appointed Locomotive Foreman, Port Mann, B.C.

J. F. McGAIRE, heretofore Travelling Passenger Agent, Winnipeg, has been appointed Travelling Passenger Agent, Vancouver, B.C.

E. E. McLEOD, heretofore in Passenger Department, Winnipeg, has been appointed City Passenger Agent, Vancouver, B.C.

S. C. SYKES has been appointed Sleeping and Dining Car Agent, Vancouver, B.C.

Canadian Pacific Ocean Services, Ltd.—The following organization covering the operation of the C.P.R. steamships and those of the Allan Line Steamship Co., is effective from Jan. 1:—

G. M. BOSWORTH, Vice President (Traf-

fic), C.P.R., Montreal, Chairman.

H. MAITLAND KERSEY, heretofore Manager in Chief, Ocean Services, C.P.R., Managing Director. Office, 8, Waterloo Place, London, S.W., Eng.

J. A. MARTIN, heretofore Agent, Allan Line Steamship Co., Glasgow, Scotland; Assistant Manager. Office, London, Eng.

Capt. J. T. WALSH, R.N.R., heretofore Chief Marine Superintendent for Canada, C.P.R., Montreal, Assistant Manager. Office, Montreal.

Capt. J. V. FORSTER, R.N.R., heretofore Chief Marine Superintendent, C.P.R., Liverpool, Eng., General Superintendent. Office, Liverpool, Eng.

H. S. CARMICHAEL, heretofore General Passenger Agent, Atlantic Steamships, C.P.R., London, Eng., Passenger and Freight Manager, in charge of all passenger and freight matters. Office, London, Eng.

W. G. ANNABLE, General Passenger Agent, Atlantic Steamships, C.P.R., Montreal, has been appointed General Passenger Agent, Atlantic Service, Canadian Pacific Ocean Services, Ltd. Office, Montreal.

C. E. BENJAMIN, General Passenger Agent, Pacific Steamships, C.P.R., Montreal, has been appointed General Passenger Agent, Pacific Service, Canadian Pacific Ocean Services, Ltd. Office, Montreal.

Canadian Pacific Ry.—E. J. WORTH has been appointed Car Service Agent, Atlantic Division, vice A. E. Prince transferred. Office, St. John, N.B.

T. C. CHOWN has been appointed acting Assistant Works Manager, Car Department, Angus Shops, Montreal, during absence of L. C. Ord on active service overseas.

H. J. HUMPHREY, heretofore Superintendent Car Service, Western Lines, Winnipeg, has been appointed acting Superintendent Car Service, Eastern Lines, vice W. Tansley transferred. Office, Montreal.

W. TANSLEY, heretofore acting Superintendent of Car Service, Montreal, has been appointed Assistant Superintendent, Montreal Terminals, vice W. Coulter transferred.

W. COULTER, heretofore Assistant Superintendent, Montreal Terminals, has been appointed Assistant Superintendent, District 5, Eastern Division, vice C. W. Lott. Office, Smiths Falls, Ont.

C. W. LOTT, heretofore Assistant Superintendent, District 5, Eastern Division, Smiths Falls, Ont., has been appointed Chief Dispatcher, Districts 1, 2, 3 and 4, Ontario Division, vice J. W. Wansborough. Office, Toronto.

G. T. ROOKE, heretofore Inspector of Dispatching Offices, has been appointed Car Service Agent, Ontario Division, vice C. Hudson transferred. Office, Toronto.

C. HUDSON, heretofore Car Service Agent, Ontario Division, Toronto, has it is said been appointed Chief Clerk to General Superintendent, Ontario Division, vice A. U. BAIN, transferred.

A. U. BAIN, heretofore Chief Clerk to General Superintendent, Ontario Division, Toronto, has it is said been appointed Assistant Car Service Agent there.

T. HAMBLY has been appointed acting Road Foreman of Locomotives, District 1, Lake Superior Division. Headquarters, Sudbury, Ont.

D. McINTYRE, heretofore Roadmaster, District 3, Manitoba Division, Brandon, has been appointed Roadmaster, Fort William Terminals, Fort William, Ont., vice J. P. Gray.

J. McREA has been appointed acting Roadmaster, District 3, Manitoba Division, with jurisdiction over Rapid City, Minn., and

G. MOTH, heretofore District Master Mechanic, Revelstoke, B.C., has been appointed District Master Mechanic, Cranbrook, B.C., vice L. Fisher, transferred.

T. J. JONES, heretofore Superintendent, Moberly Division, Moberly, Mo., has been ap-

Intercolonial Ry. Hospital Train.—Reference has been made in the daily press to a special hospital train in operation by the Intercolonial Ry. We are officially advised that no special rolling stock has been provided for this purpose. The first train left St. John, N.B., Nov. 29, consisting of 1 combined baggage and colonist car, 3 tourist cars, 1 standard dining car, and 5 sleeping cars. The military officer in charge of the returning soldiers reported that all the cars were most comfortable and well equipped, and gave excellent service. Every possible attention was paid by the Canadian Government Railways officials to make the men comfortable.

Electric Railway Department

Report on Radial Railway Entrances and Rapid Transit for the City of Toronto.

The Toronto City Council on Feb. 22, 1915, appointed the Commissioner of Works, R. C. Harris; the Chief Engineer, Toronto Harbor Commissioners, E. L. Cousins, B.A. Sc., A.M. Can. Soc. C.E., and the Chief Engineer of the Hydro Electric Power Commission of Ontario, F. A. Gaby, to prepare a comprehensive plan for a proper rapid transit system with radial entrances. The three officials above named met on Feb. 26, 1915, and having secured Mr. Cousins' consent to act as Engineer in Charge, obtained the Harbor Commissioners' permission to permit him to supervise the work in addition to his other duties. The result is embodied in a report which was submitted to the City Board of Control on Dec. 6 as follows:

General Conditions Underlying Study.—The future growth and development of the city will be largely dependent upon the provision of adequate transportation facilities, properly located. The extension of these facilities should, and usually does, precede the population, but in Toronto of late years the conditions have been reversed. Any policy which results in such reversal will fail to develop the resources of the city to the fullest extent. The growth of Toronto beyond the limits of the areas served by car lines has been remarkable. There are at present approximately 85,200 people residing without the city limits of 1891, and 31,400 of an interurban population, outside, but adjacent to, the present city limits, totalling 116,600 people, the equivalent of almost a quarter of the entire population of the city. Future expansion may be directed, and largely controlled, by the establishment of a broad, definite transportation policy, providing for the control of all electric railway lines, radial and local, operating within the city limits.

Existing Conditions.—The present situation in Toronto is briefly as follows: The Toronto Ry. Co. holds the franchise, expiring in 1921, for exclusive surface railway rights (subject to certain exceptions) on the streets of the city as of 1891. The railway company, many years since, objected that under its charter, it was not required to extend its lines beyond the city limits of 1891, and was upheld by decision of the Imperial Privy Council. During the period intervening between that and the present the city continued to increase in population and area, until now, as hereinbefore stated, there are approximately 85,200 people living without the limits of 1891, and within the limits of 1914. In addition there are some 31,400 persons residing adjacent to, but outside the city limits, and within the limits of approximately an eight mile radius from the corner of King and Yonge Sts. The municipality in 1911, and succeeding years, constructed civic car lines in outlying districts, along Gerrard St., Danforth Ave., St. Clair Ave., and Bloor St., west from Dundas St. At present there are 18.28 miles of single track civic line in operation, with a graduated fare, the maximum being 2c. The revenue derived pays operating expenses. There are still districts without the limits of 1891 lacking adequate means of transportation. This condition can only be relieved by the construction of additional civic lines, always keeping in mind the necessity for ultimate unification of the lines so built, with the present street railway system upon its acquisition by the city in 1921. This is the

only economical and reasonable form of quick relief to be given these districts.

Radial Railway Entrance.—We have carefully studied the question of radial railway entrance, assuming the following bases: 1. The acquisition by the city of the Toronto Ry. on the termination of the franchise in 1921. 2. The construction of the waterfront viaduct by the Grand Trunk and Canadian Pacific Railways. The main principle governing our studies has been the creation of a comprehensive plan for entrance and terminal facilities for all radial railways, of the present and future, and to provide those facilities on such a scale as to embrace probable requirements for the next 25 years; i.e., to provide forthwith lands for ultimate requirements as to terminals and rights of way of the various main trunk lines, but developing and constructing on the unit principle as conditions



E. L. Cousins, B.A. Sc., A.M. Can. Soc. C.E.,
Chief Engineer, Toronto Harbor Commission.

necessitate and finance permits. In investigation of possible radial entrances, we have surveyed and contoured in detail approximately 150 miles of line, radiating from the centre of the city, in northerly, westerly and northwesterly, easterly and northeasterly directions. These activities have not been confined to the area lying within the city limits. While on the presentation plans we indicate areas to be served by these trunk radial railway lines, we desire to emphasize that, while detailed alternative locations have been made in every case, we have refrained from indicating exact locations, in order to prevent real estate exploitation at the expense of the citizens generally, and this project in particular. Fortunately, we were able, both on the east and west, from the waterfront north, to locate several lines, all of which would afford satisfactory alignment and gradients. While in the estimates liberal allowance has been made for the cost of right of way, we are of opinion, that if prudently handled, especially in the outlying districts, such right of way may be

secured at little expense, by reason of the fact that large real estate owners will, in all probability, dedicate same, because the benefit accruing to their properties from modern transportation facilities, will handsomely repay them for any land so contributed. If real estate owners hold their lands at prohibitive prices, then, under the scheme presented, it will be easy to adopt other locations, which will equally well serve the requirements. This phase of the problem involved detailed study of the following, viz.: Present and future radial railway situation and probable volume of business. The physical location of the trunk line entrances within the city limits, adequate for present and future requirements. The location, size and character of terminal, having always in mind the fact that it should be located, if possible, on the axis of maximum movement. Provision for future expansion both as to trackage for trunk line entrances and terminal facilities. Provision for proper interchange of traffic with steam railway lines. The co-ordination of rail and water transportation. The possibility of locating the trunk line entrances, so as to permit of their use for serving suburban districts adjacent to the city. The economics of the whole question.

Rapid Transit System.—The object of the study has been, in the main, to secure by survey and research all useful data pertaining to the economic and physical conditions of the problem. We have attempted by a combination of practical and theoretical analysis, to estimate the probable future growth, distribution, and density of population, for the city and surrounding territory, i.e., as applied to residence, light and heavy industries, wholesale, warehouse and general business. To obtain these results, we have made a comparative study of the past growth of the city, and contrasted such with like data from other cities of similar size, and some that now have several times our present population. It is well known that, generally speaking, the growth of most cities, having relatively similar characteristics, follows well defined lines, which, graphically plotted, are of considerable use in projecting probable future population. The density of population is controllable, requiring only adequate transportation facilities, properly placed, together with such legislation as will prevent improper housing.

Rapid transit is not necessary in any city until such time as the congestion, due to vehicular, pedestrian and surface railway traffic on the streets, in the central section, has reached or is rapidly approaching the point of saturation, and then only after every other effort has been exhausted to improve existing surface transportation facilities. If this proves futile, then and then only, should serious consideration be given rapid transit. This term is generally misapplied. To many, it portends the elimination of all overcrowding conditions, and the final solution of transportation problems. As a matter of fact, there is as marked overcrowding on rapid transit lines as one encounters on the majority of surface railways at the rush hour periods. It means, in effect, the accomplishment of maximum distance in minimum time, and the amelioration of surface congestion. To provide such, the following methods are usually employed: Underground subway or tunnel construction. Elevated track structures. Combination of

January, 1916.]

both elevated and subway systems. Complete grade separation by elevation or depression. Suburban steam railway service. Its adoption is usually indicated by the population of the city and its environs, the physical and economic features of the situation, and the riding habit of the people. Rapid transit service, in the true sense of the term, has never been provided in cities of less than 1,000,000 population, mainly for the reason that the initial cost is so excessive that the average riding habit is insufficient at a 5c. fare to produce the revenue necessary to recoup the investor.

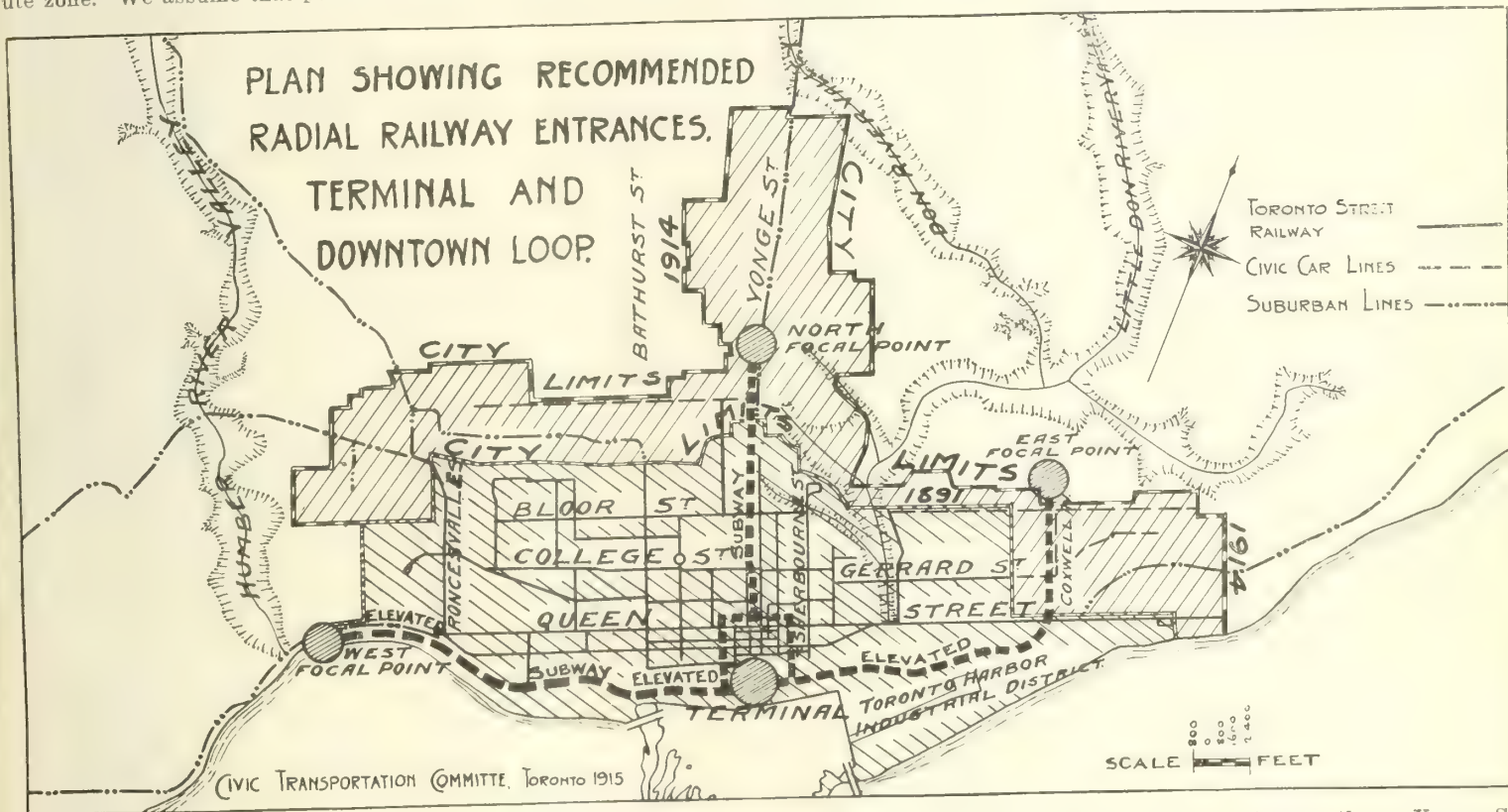
Toronto is not in a position to construct a rapid transit system in the strict sense of the term, but may, when conditions demand, institute a semi rapid transit service, by using the radial railway entrance lines. We have developed the radial entrance plan so as to permit of such joint use. By so doing, adequate and rapid service may be furnished that portion of the population living outside of what we have termed the 35 minute zone. We assume that persons who can

of present city streets. Is the present street railway system being operated at maximum capacity? The economics of the whole situation.

The problem resolves itself into three main phases, viz.: Can the immediate future transportation demands be best met by: The extension and more efficient operation of the existing street railway system? A separate rapid transit service without attempt to improve the present system? A combination of rapid transit and surface feeder system, i.e., surface feeders in the areas beyond the limits of 1891, and rapid transit by means of subways within the limits of 1891? Out of the foregoing arise the following: Are the streets in the central area capable of handling future traction and vehicular demands, or will other rights of way be required to relieve them? Analysis of the present speed schedules. Possible improvement in time travel, either by more efficient operation, better routing, improved track and equipment, or a combination of all. Present volume of traffic,

Toronto Ry., if provided with improved equipment, and operated at higher service efficiency, can be made to adequately serve the city within the limits of 1891. As traffic officers become more efficient in direction, and citizens better appreciate the functions of such officials, the movement of rail, vehicular and pedestrian traffic will be greatly facilitated, with consequent saving of time and added safety to all. If a sufficient number of cars of modern type were provided, thereby minimizing overcrowding, and the public educated to embark and debark with reasonable speed, it would result in more rapid operation of the railway system, and the facilitation of other classes of traffic. There is comparatively little congestion in Toronto streets. This may be further minimized by regulation of slow moving, heavily laden traffic from main heavily trafficked thoroughfares in the central area.

That the following railways entering the outlying portions of Toronto viz.: The Toronto & York Radial Ry., embracing the



travel from the central area to their abode, or vice versa, in 35 minutes, do not require more rapid transport. We shall show in this report that, within the limits of the city as at present constituted, adequate extension of the existing street railway lines, coupled with improved rolling stock and efficient operation, would bring the extreme outlying portions of Toronto within the 35 minute zone, wherein the necessity for other than surface transportation, as aforesaid, is not indicated. The study of this section involved detailed consideration of the following, viz.: Existing street railway situation and preparation of time zone maps. Do existing conditions warrant rapid transit service? Distribution of present population, general business and industries. Past growth of the city as applied to population, heavy and light manufacturing, wholesale and general business distribution. Probable future growth of the city as applied to the preceding sentence with resultant distribution. Past and existing topographical and other barriers to proper growth and distribution. Capacity and use

with origin and destination. Counts of passenger traffic to determine lines of heaviest movement, and points between which the public require other than direct movement to or from the central area. Street traffic counts to ascertain the degree of congestion in the portion of main thoroughfares lying within the central area. Determination of increased volume of future passenger business, and the possibility of handling same by larger car units. Consideration of advisability of changing gauge of present system from 4 ft. 10½ ins. to standard gauge of 4 ft. 8½ ins.

Conclusions.—After detailed consideration of the various factors entering into and affecting the problem as hereinbefore recited, we have concluded that: Additional civic car lines laid between now and 1921 without the limits of 1891, but within the limits of 1915, will, after acquisition of the Toronto Ry. by the city, in 1921, adequately serve all sections within the present city limits; the maximum time necessary to reach extreme destination being 35 minutes. The existing surface system of the

Metropolitan, running north on Yonge St., and the Kingston Road line from the Woodbine; the Port Credit line from Sunnyside; the Toronto Suburban to Lambton, Weston and Woodbridge, from Keele and Dundas Sts., cannot be considered rapid transit interurban lines, as in all cases they operate mainly on the highway at low speeds. The people of Toronto and the province have not had the advantages of modern rapid interurban service, such as is operated in many parts of the United States. When the hydro radial railways project becomes an accomplished fact, the system of which the section operating between London and Port Stanley is a happy augury, the entire population of the province will derive therefrom tangible benefits, which result to a community from a modern, high speed, properly equipped and efficiently operated system.

That the most feasible entrances from the east and west lie along the waterfront route. The entrance from the north may be readily effected by subway construction. The foregoing conclusions were arrived at

after careful reconnaissance of the possible routes of entrance for radial railways, in the city and its environs, and detailed survey of one hundred and fifty miles of line.

From the view point of economy of operation and utility, it is essential that the terminal be located on the axis of maximum movement. Having regard for the past suggestions for an uptown terminal, we thoroughly investigated this possibility, with the result, that aside from operating considerations, the additional cost of \$8,000,000, embracing a four track subway from the waterfront to College St., and the erection of a terminal at the latter point, proved it unfeasible. The foregoing indicates the necessity for location on waterfront route. The same consideration applies also to the location of yards on the waterfront property, in view of its natural advantages.

It is prudent to make present provision for future expansion, covering trackage for trunk line entrances and terminal facilities, therefore the necessary sites should now be provided for ultimate development. It is necessary to make ample provision for the co-ordination of rail and water transportation, and the proper interchange of all traffic. The radial railway trunk lines should, as the future demands, and the city extends, provide for the operation of semi rapid transit lines to serve outlying districts.

The streets in the central area are sufficient to care for future traction and vehicular demands, provided reasonable regulations are enacted and enforced governing vehicular and pedestrian traffic. Traffic may be much facilitated by an increase in speed of the existing Toronto Ry. units. This entails improved equipment, track, routing and operation, together with the adoption of up to date loading and unloading facilities, and the much needed education of the public to embark and debark speedily. The accomplishment of this, together with adequate extension of surface lines, will make it possible to travel from the centre to the present city limits within a 35 minute period. We have been assisted to the foregoing conclusions by the study of drawings 8 to 15 inclusive, showing present volume of traffic with origin and destination, lines of heaviest movement, and street traffic counts.

In relation to the matter of change of gauge, notwithstanding that almost every economic consideration declares against it, the dominant factor is that of future traffic unification, between radial, semi rapid, and city surface lines, and this is impossible without the reduction of the present gauge from 4 ft. 10½ ins. to 4 ft. 8½ ins.

As hereinbefore indicated, there is no justification whatever for the construction in Toronto of a rapid transit system in the strict sense of the term.

Recommendations.—We beg to respectfully recommend that: The city acquire the Toronto Ry. at the expiration of the franchise in 1921, and thereafter operate same as a municipal railway. The city should at once make a definite declaration of policy in this regard. If the decision be to municipalize the service, preparatory steps should immediately be taken, in order that upon the date of franchise expiry the city may enter into occupation and operation without overhanging tenure complications. A transportation commission should be at once appointed, consisting of representatives from the city, the Toronto Harbor Commission and the Hydro Electric Power Commission of Ontario, so constituted as to afford the city majority representation. This commission should be vested with all necessary power to plan, control and direct all transportation and terminal facilities of every kind whatsoever (exclusive of exist-

ing steam railways), including present or projected municipal lines within the corporate limits of the municipality, and to prepare and arrange for the acquisition and operation of the Toronto Ry. Company as a municipal utility upon expiry of the franchise rights of said company; the powers of this commission to be sufficiently inclusive to embrace all railway transportation facilities as aforesaid, and to be implemented from time to time, in order to accomplish the full intent of this recommendation. The Harbor Board and the Hydro Electric Power Commission of Ontario should be represented upon this commission in extension of the policy of council already expressed in the appointment of the board charged with the duty of making this report, and for the same reasons which guided that body in the constitution of such board, viz.: That the future transportation facilities within Toronto should be co-ordinated with regard to the services, rights and holdings of the bodies aforementioned, with particular reference to radial entrance and railways, the operations of the Harbor Commission as trustees for the city, and local street railway service within the city limits. Hydro Electric Power Commission of Ontario, through its municipal radial railway project, is at present undertaking the construction and development of some 1,000 miles of radial railways, with Toronto as a main terminal focal point; the Harbor Commission, as trustees for the city, control the proposed east and west trunk radial railway entrances, together with the proposed terminal site, contemplated team track delivery yards and general sorting yard, while the city has jurisdiction over all public streets, embracing surface, elevated and underground rights. Even cursory consideration will demonstrate the necessity of harmonizing all these interests, if transportation problems are to receive adequate and effective treatment. This can best be accomplished by the creation of a commission constituted as recommended. The construction of the three trunk radial entrance lines, with necessary yards and terminal, as shown on drawing 18, be proceeded with when conditions warrant and finance permits. A rapid transit system in the strict meaning of the term be not adopted. The radial railway trunk line entrances be used for a semi rapid transit service, as conditions warrant, to serve the population in the districts lying at present without and adjacent to the existing city limits. It may be necessary to procure legislation amending existing acts, in order to give effect to the foregoing. The use of any of the lines, yards, terminals, and anything whatsoever, in any way relating or appertaining thereto, by any other railway, than those of the Hydro-Electric Railway Union and the city, shall not at any time be permitted, until such railway shall have obtained the consent of the Hydro-Electric Power Commission of Ontario thereto. We do not make suggestion as to finance and reimbursement, feeling that this does not lie within our jurisdiction, but is for each to take up with his respective principals.

Estimate of cost radial railway entrances, terminal and yards.

West line, from terminal to west focal point, 5.2 miles	\$ 4,076,000
East line, from terminal to east focal point, 4.7 miles	3,120,000
North line, Queen St. to north focal point, 3.2 miles	7,696,000
East and west yards and freight facilities	1,365,000
Terminal station, and car house	2,560,000
	\$18,817,000

The foregoing estimates cover land acquisition and permanent construction, exclusive of value of lands vested in Harbor Commission and city, and property rentals for ter-

minal and yards. These estimated costs provide for ultimate construction, with the exception of the additional two tracks for four track construction. The work to be undertaken in units as conditions warrant and finance permits.

Plans and Charts.—Accompanying the report are a number of elaborate colored plans and charts as follows:—Annexation map showing dates at which various districts were annexed to the city; franchise map; plan showing built up area of Toronto at different periods; topographical barriers affecting same; population dot maps at various periods from 1879 to 1914; isometric projection showing density of population per acre per block within present city limits; classified occupancy in built up area in and surrounding city; past growth of central business area; street traffic map showing volume of vehicular and street railway movement in central section; analysis of passenger movement during morning rush hour period, showing requirements for car service in various sections of city; diagram showing homeward movement during evening rush period; diagram showing volume and distribution of daily passenger traffic on street car routes; diagram showing riding necessity or habit of the population in various sections of city; plan exemplifying conditions arising from confinement of Toronto Ry. lines within, and the growth of Toronto beyond city limits of 1891; time zone diagrams, present and attainable service; probable future occupancy maps showing topographical barriers unbroken and broken; plan of existing surface systems, radial railways and proposed radial railway entrance lines and terminal; perspective sketch of proposed water front terminal between Bay and Yonge Sts.; population of townships, villages, towns and cities in Southwestern Ontario; value of farm and manufacturing products for townships, villages, towns and cities in Southwestern Ontario. An appendix to the report contains a large amount of descriptive matter dealing with the plans and charts.

Result of the Use of Meters on Brandon Municipal Railway.

Thos. Boden, Superintendent, Brandon Municipal Ry., Brandon, Man., has presented the following figures showing the power consumption without meters for the year ended Sept. 30, 1914, and with meters for the year ended Sept. 30, 1915:

	Without Meters.	With Meters.
Power consumed in k.w.h.	607,996	491,900
Car miles	268,244	278,044
Average k.w.h. per car mile ..	2.266	1.769
Cost of power per year	\$12,159.82	\$9,838

The cost of meters was \$200; installation \$10; repairs, nothing. Power costs 2c per k.w.h. The above figures include all losses.

American Electric Railway Association Committees. The following officials of Canadian electric railways have consented to serve on the committees mentioned: Taxation matters, G. Kidd, General Manager, British Columbia Electric Ry.; P. Dube, Secretary-Treasurer, Montreal Tramways Co.; J. W. Crosby, Manager, Halifax Electric Tramway Co.; Wilford Phillips, Manager, Winnipeg Electric Ry.; R. J. Fleming, General Manager, Toronto Ry. Transportation, P. Dube, Wilford Phillips, H. G. Matthews, General Manager, Quebec Ry., Light and Power Co.; E. L. Milliken, Local Manager, Cape Breton Electric Co. Buildings and Structures (Engineering Association), H. G. Salisbury, Architect and Structural Engineer, Toronto Ry.

The Hydro-Electric Power Commission of Ontario's Proposed Electric Railway from Toronto to London.

Some details respecting the electric railway, which the Hydro Electric Power Commission of Ontario proposes to build between Toronto and London, on behalf of the municipalities concerned, have already appeared in Canadian Railway and Marine World. Draft bylaws have been prepared for submission to the vote of the ratepayers in the different municipalities, showing that the estimated cost of the completed line, including equipment, is \$13,734,155. The amount which is estimated to be required for the maintenance of the railway, apart from operating expenses, is \$214,583 a year. The operating revenue is estimated at \$1,692,175 a year, and operation and maintenance at \$817,025. The annual amount required for interest for the first 10 years after the issue of bonds would be \$686,708, and for the next 40 years the amount required for sinking fund charges and retirement would be \$137,342, and for interest, \$686,708.

Under agreements which it is proposed the municipalities shall enter into with the Commission, the latter is to build, equip and operate the railway according to an agreed route, and to issue bonds covering the cost, and it retains power to regulate fares and tolls to be charged for all classes of service. The municipalities agree to issue debentures for the proportions of the total amount of construction assigned by the Commission, maturing at 50 years, the period for which the agreements are to run, and these debentures will be held by the Commission as security, and as guarantees for the Commission's bonds, issued from time to time, and they may be disposed of in such proportions and at such times as the Commission may determine. The municipalities are debarred from making any agreement with, or bonusing any other railway or transportation company, and are to furnish free right of way over any municipal property at the Commission's request. In the event of the revenue derived from the operation of the railway being insufficient in any year to meet the operating expenses, including power, the cost of administration and the annual charges for interest and sinking fund on bonds, and for the renewal of any works, any such deficit shall be paid to the Commission on demand by each municipality in proportions to be adjusted by the Commission, and on the failure of any municipality to pay such proportion of deficit, the Commission may dispose of debentures held as security. If any municipality should fail to perform its obligations, the service to that municipality may be discontinued without notice, but the municipality shall not be relieved from the effects of its default. In any differences between the municipalities concerned, the Commission shall hear representations, and its decision shall be final.

The general route, as settled by the Commission's engineers, but which is subject to slight changes, is as follows:

Toronto Terminal-Humber River Section.—From the passenger terminal to be located near the foot of Yonge St., westerly to Sunnyside, using Toronto Harbor Commission's property and private right of way wherever possible, thence to the Humber River, paralleling the G.T.R.

Humber River-Port Credit Section.—From the westerly limits of Toronto at the Humber River, westerly parallel to the G.T.R., crossing the Credit River between the Lake Shore Road and the G.T.R.

Port Credit-Milton Section.—From Port

Credit, crossing the G.T.R. about a mile west of the village, to a point north of Sheridan post office and thence direct to Milton.

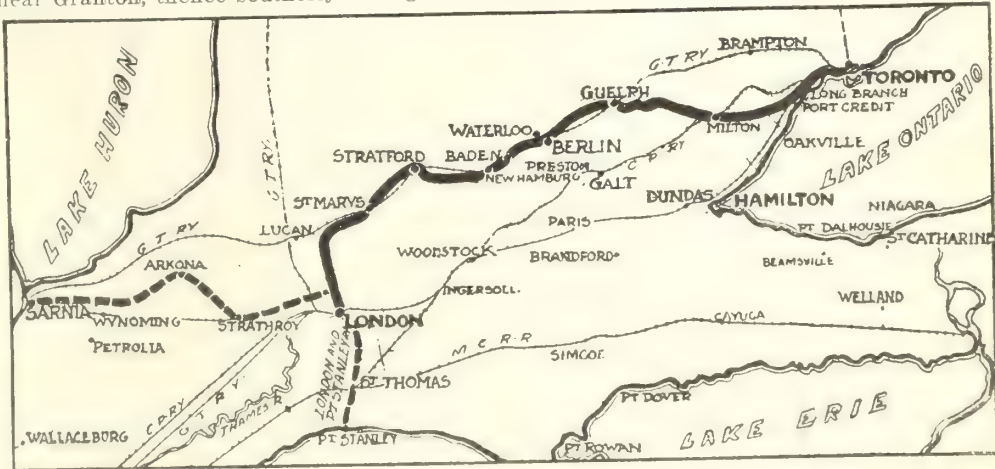
Milton-Guelph Section.—Crossing the C.P.R. west of its station at Milton, to Esquesing Tp., Nassagaweya Tp., Puslinch Tp., and thence in the general direction of the Eramosa River, to Guelph.

Guelph-Berlin Section.—From Guelph westerly to Berlin, entering the latter city on the northeast, running north of the G.T.R. between the two cities.

Berlin-Stratford Section.—From Berlin, paralleling the G.T.R. to Baden, and thence south of the G.T.R. to a point east of Stratford, crossing the G.T.R. and entering the city.

Stratford-St. Marys Section.—From Stratford westerly, paralleling the G.T.R. to a point north of St. Marys.

St. Marys-London Section.—Southwesterly through St. Marys and thence westerly, crossing the C.P.R. at grade, and the Thames River, and thence paralleling the G.T.R. to near Granton, thence southerly through Bid-



Route of Proposed Electric Railway from Toronto to London.

dulph Tp. to the northern boundary of London Tp., thence southeasterly from Con. 14 to Con. 10, and thence southerly through Cons. 9 to 4, and following the Thames River through Cons. 3 to 1, to a point between the Sarnia Road and Thames River, a short distance west of Warnclyffe Road, outside the northwest boundary of the City of London, thence southeasterly over private property and city streets, crossing the Thames River to Bathurst St., and easterly along Bathurst St. to the London and Port Stanley Ry., which at present terminates on Bathurst St., just east of Richmond St.

As previously mentioned, the total amount of debentures to be issued is \$13,734,155, and the Commission has apportioned the following amounts to the various municipalities:

Township of London	\$630,389
" " " " " "	578,921
" " " " " "	521,903
" " " " " "	462,509
" " " " " "	479,065
" " " " " "	118,735
" " " " " "	316,262
" " " " " "	315,355
" " " " " "	313,147
" " " " " "	361,025
" " " " " "	401,235
" " " " " "	248,585
" " " " " "	142,166
" " " " " "	91,822
" " " " " "	70,300
" " " " " "	12,150
" " " " " "	31,130
" " " " " "	33,100
" " " " " "	39,000

City of Toronto	1,210,196
" " " " " "	1,109,303
" " " " " "	774,040
" " " " " "	731,862
" " " " " "	651,735
Town of Waterloo	193,900
" " " " " "	153,940
" " " " " "	65,000
Village of Mimico	111,200
" " " " " "	82,250
" " " " " "	54,050
" " " " " "	66,250

Total amount of bonds to be issued. \$13,734,155

The majority of these municipalities have agreed to submit bylaws to the vote, early in the year, some in January, and others later. At the time of writing, the following have decided not to submit such votes: South Easthope, \$316,262; Ellice, \$33,100, and Puslinch, \$70,300.

With regard to the Toronto end of the projected line, some misapprehension seems to have existed in connection with the operation of the line on city streets, and also as to the free right of way through municipal property. Sir Adam Beck, on Dec. 7, explained these points to the Board of Control, at a private meeting, after which, he

is reported to have stated that the bylaw would be submitted in its present state, but that legislation would be introduced later to make it clear that the city's rights on its streets would not be jeopardized. The right of way matter referred to easements through public parks and other lands, he stated, and not to the purchase of land.

At Berlin, some discussion has taken place regarding the route through the city, and it was decided, Nov. 29, that the main passenger line should pass through by way of Victoria and Wilmot Sts., and the question as to whether the line should pass through New Germany, Bloomingdale and Bridgeport, or through Breslau, was left to the Commission's discretion. It was also recommended that a spare line for freight traffic should be built through the northerly section of the city, between Berlin and Waterloo. The tentative apportionment for Berlin is \$774,000, but it was stated that if the Commission's recommendations for the rerouting had been accepted, the city's share would have been \$970,000, but owing to the changes since agreed upon, the amount would have to be reapportioned.

It will be noticed on reference to the accompanying map that the location of the proposed line between Toronto and Port Credit is practically the same as that of the Toronto and York Radial Ry., operating between these points. In discussing this and other similar matters in Toronto, Dec.

8, Sir Adam Beck is reported to have stated that the Mackenzie and Mann interests had offered to sell the Metropolitan section of the Toronto and York Radial Ry. to the city, and that those interests and the Commission have discussed an agreement whereby the Commission may possibly purchase their interests in the province. While nothing has been definitely settled, he stated that arrangements have reached the point where both parties have practically agreed on a price. The Toronto Board of Control passed a resolution, Dec. 15, to the effect that the Commission be requested to negotiate for the purchase of the Metropolitan Division of the Toronto & York Radial Ry., under the provisions of the Hydro Electric Railway Act.

Saskatoon Municipal Railway Finances.

The report of the City Commissioner of Saskatoon, Sask., on the city finances for 1915, contains the following information respecting the operation of the municipal electric railway: During the first 10 months the revenue showed a considerable falling off as compared with the same period of 1914. The total number of passengers carried was 2,099,360, against 2,083,408; the operating expenses, excluding fixed charges, were \$85,938, against \$105,229.02, the principal reductions being made in wages and the cost of power. The loss was \$31,748, against \$26,743. It is estimated that the total loss for the year will not exceed \$33,000. The following statistics are added:

	1914.	1915.
Miles of track	14	14
Miles of track reduced to single ..	16½	16½
Miles run	579,583	590,876
Traffic receipts per car mile ..	22.27c	17.72c
Operating expenses	19.27	15.53
Average miles per car per day ..	150	165
Average cars operating daily ..	14	12
Percentage operating expenses to receipts	86%	87½%
Average fare per passenger ..	4.518c	4.93c
Average number of employees ...	90	84

The average daily receipts for the first 14 days of Nov. were \$442. With respect to the Sutherland line the report says: "For the first nine months of the year the traffic showed a considerable falling off, but the receipts now show a decided improvement. For the first 10 months of the year the total operating expenses on this line were \$6,782.39 and the receipts \$6,056.32, a loss of \$726.07."

The Jitney Situation in Canada.

The number of jitneys operating in Toronto shows a considerable diminution, and it may be said that with the exception of certain of the more crowded thoroughfares, they have ceased to be a factor in city traffic. We are advised that there were recently 21 or 22 cars operating in competition with the Toronto and York Radial Ry.'s Metropolitan Division, and a somewhat larger number operating on Yonge St., in competition with the Toronto Ry. This does not mean that there are 50 or more jitneys operating on Yonge St., but that slightly over 20 of those operating extend their routes so as to come in competition with the suburban electric railway service. The Lake Shore road and the West Toronto-Weston jitney services appear to have been abandoned.

The only other part of Canada in which there appears to be any activity in the jitney business is on the Pacific Coast. The jitney operators in New Westminster are applying to a British Columbia court to have the by-law prepared by the City Council recently, quashed. The action is being taken by the Big Five Jitney Co., which alleges, among

other things, that it is being discriminated against in favor of the Blue Funnel Motor Co.'s cars, a new company running cars between New Westminster and Vancouver started operating Dec. 5, cutting the fare from 25c to 20c. Only five cars were put in service on Dec. 5, but C. Gowan, who is managing the new line, is reported to have said that 20 will be put in operation, on a 5 minute schedule, and with a return fare of 25c. It is reported locally that the British Columbia Electric Ry. is interested in the new venture. The South Vancouver municipal council took up the question of the regulation of jitney traffic, Nov. 30. A jitney service was started Dec. 7, from the Hollyburn landing place of the Fourteenth St. ferry to Dundarave.

Three Rivers Traction Company's New Line Opened.

The electric railway which has been built in Three Rivers, Que., recently has about 3 miles of track and forms a belt line, starting at the C.P.R. station, passing through the residential district, thence along the river front, and returning to the station, via the main business thoroughfares. An extension to the Wayagamack Pulp and Paper Co.'s plant is nearing completion, and will be in operation early in January. This line will connect the Wayagamack, and other industries situated at the mouth of the St. Maurice River, with the city. Next it is intended to build a line of 2.5 miles to Cap de la Madeleine, a popular pilgrimage centre.

The roadbed is of crushed stone, and on the important streets the roadway is of concrete, and was laid at the same time as the railway track. A 60-lb. T rail is laid on cedar ties on the tangents and hemlock ties on the curves. The overhead material equipment is standard. The construction is of the span wire type supported on steel poles. The steel poles carry, in addition to the tramway trolley circuit, the lighting distribution wires, both primary and secondary, and also street lighting series circuits. The poles are placed in such a way as to serve both the Shawinigan Power Co. and its subsidiary, the Three Rivers Traction Co.'s needs wherever possible. Some of the steel poles are perhaps somewhat unusual, being 55 ft. high at points where they carry wires over running road bridges. The trolley wire is grooved 3.0 B. & S. wire. The size is larger than actually required, and as there are no feeders on the system it is larger than usual, but this was installed because of the fact that no feeders were provided.

Power is obtained from the North Shore Power Co. from its central station. To take care of this load it installed two 250-k.w. 600 volt d.c. motor generator sets. The power is generated at Shawinigan and taken into Three Rivers at 50,000 volts over 4 transmission lines, and transformed down to 2,200 volts.

The car barn is of steel, brick and galvanized iron construction, and provides for 7 cars. The repair shop, of brick, is incorporated in the same building, and will accommodate two cars. It is provided with a single track constructed over an inspection pit. The shop is equipped with the usual small tools; power and lighting being furnished at 110 and 220 volts. It is electrically heated. There are also the Superintendent's office, store room and carmen's room.

The 6 single end, single truck, one man, rear fill cars, and the single truck combination sweeper and tower car, with which the line is equipped, were fully described and

illustrated in Canadian Railway and Marine World for December.

The city belt line was formally opened Dec. 11, the first car being run nominally under the direction of Hon. J. A. Tessier, M.L.A., Mayor of Three Rivers, and Minister of Roads for Quebec. At a subsequent reception to the company's officials at the city hall, the Vice President, Julian C. Smith, spoke on the company's behalf, and Hon. Jacques Bureau, M.P., and W. Y. Soper, of Ottawa, also spoke. Among the company's officials present were Howard Murray, W. S. Hart, and G. C. Hiam, of Montreal.

The Lake Erie and Northern and the Grand Valley Railways.

A bylaw is to be voted upon by the ratepayers of Brantford, Ont., Jan. 3, to ratify the sale of the section of the Grand Valley Ry., from Paris to Galt, 13.07 miles, for \$30,000. We are officially advised that the agreement to sell was passed by the railway committee, which comprises a majority of the city council. The property to be sold consists of the right of way and tracks for the mileage named, the city council to have the right to lift the tracks, etc., from the Blue Lake branch. This agreement was ratified by the city council, Nov. 30, with the condition that the bylaw be ratified by the ratepayers. The council also decided to allow the Lake Erie & Northern to repair the track from the diamond to the south of Galt, where the L.E. and N.R. tracks cross, about 3,500 ft., which will enable that company to operate the line as soon as it is ready to do so. The company is electrifying the line between Brantford and Galt, and will also electrify the line from Brantford to Port Dover, 31.4 miles, the track laying on which has just been completed. This work is being done as part of the consideration involved.

The Grand Valley Ry. was part of the property acquired by the city, on the winding up of the G.V.R. Co. The city retains the lines within Brantford, and the section of the G.V.R. from Brantford to Paris, 7.68 miles. The Paris-Galt section is in a bad state of repair, and it was estimated that it would cost \$43,000, with a further outlay in the immediate future of \$30,000 for new steel rails, to put it in a position to meet the competition of the L.E. and N.R. This section of the line is being operated by three passenger cars and one freight car, entrance being obtained into Galt over the Galt, Preston and Hespeler St. Ry. tracks. The revenue for the six months ended June 30 was \$6,675, and the operating expenses were \$8,230. After making provision for interest, sinking fund and depreciation, the total deficit for the six months was \$2,674. The value of the section, as estimated by J. C. Royce, consulting engineer, is, exclusive of right of way, \$21,000.

In connection with the operation of the line, it is understood that connection will be made with the Galt, Preston and Hespeler St. Ry. (which is also leased to the C.P.R.) at Galt, and that an agreement for the issue of through tickets has been made with the Brantford and Hamilton Ry. It is further said that the company has entered into an agreement with the Brantford and Hamilton Ry. for the erection of a union terminal at the foot of Lorne Bridge, Brantford.

The Montreal Tramways Co. informed the city council Dec. 7 that a through service, without transfer, from the city to Cote St. Paul, would be run during the winter, but would be discontinued as soon as navigation was reopened on the Lachine Canal.

Jitney Regulations in Toronto.

The bylaw regulating jitney operation in Toronto was enacted as an amendment to bylaw 69 relating to owners of cabs and other vehicles used for the conveyance of passengers and the drivers thereof.

The latter bylaw is amended by adding at the end of sec. 14 the following words:—

"Where the application is for a license to operate an automobile for the conveyance of passengers (commonly called a jitney), it shall state the number of passengers it is intended to carry, and the number of passengers shall be mentioned in the license, and shall in no case exceed seven, exclusive of the driver, and it shall be subject to inspection at any time by the Chief Constable or any person appointed by him to perform such duty, and shall at all times be kept in a condition satisfactory to the Chief Constable."

Bylaw 69 is also amended by inserting after sec. 14 the following sections:

"14a. An applicant for a license to operate an automobile for the conveyance of passengers (commonly called a jitney), shall take out a policy of insurance in a company satisfactory to the City Treasurer against accidents to the amount of \$1,000, and deposit the same with the City Treasurer with an assignment to the Corporation of the City of Toronto in trust, and shall during the currency of his license keep such insurance in force and shall deposit therewith and undertaking in writing to do all things necessary to recover compensation from the company in the event of any accident arising from the operation of any such vehicle, and also to permit the city to do so. Such policy of insurance shall be held by the city as a guarantee that all just claims against the licensee will be paid and the city may settle all such claims up to the said amount out of any money paid under any such policy. The city shall not be responsible for any accident or damage to persons or property arising from the operation of any such vehicle."

"14b. No licensee shall carry in any vehicle licensed under the foregoing section a greater number of passengers than such vehicle is intended or allowed to seat."

"14c. No person shall be allowed to stand on the running board or step of any such vehicle while the same is in operation."

"14d. No driver of any such vehicle shall smoke while driving any passenger or passengers."

The London and Port Stanley Railway and Michigan Central Rd. Traffic.

Under old conditions, the Michigan Central Rd. obtained an entrance into London, Ont., by an arrangement with the Pere Marquette Rd., the lessee of the London and Port Stanley Ry., and utilized for terminals an area of land leased from the London and South Eastern Ry. With the expiry of the L. and P. S. R. lease a new arrangement had to be made. Under the new agreement, the L. and P. S. R., according to a press report, agrees to run two freight trains a day, the charge to the M.C.R. being at the rate of \$3, \$4 or \$5 a car, according to the number of cars per train, the minimum charge to the M.C.R. being \$25,000 a year. The whole of the M.C.R. passenger business between St. Thomas and London, will be handled by the L. and P. S. R. The agreement is to run for 30 years, and provides that only electric traction will be used in the M.C.R. yard in London. The electrification of the spur connecting with the M.C.R., and of the tracks in the M.C.R. yards is being proceeded wth.

Calgary Municipal Railway Department Organization.

The Calgary, Alberta, City Council, passed a bylaw Nov. 22, appointing Commissioner A. G. Graves, Supervisor of the Street Railway Department, to hold office as long as he continues in the official capacity of Commissioner, or unless it is sooner repealed by the Council. The bylaw creates a department of the city to be known as the Street Railway Department, to be in charge of one of the city's commissioners, which shall have the administration, control and management of the city's street railway. The City Council will appoint a superintendent who shall be in direct charge and have the care and management of the property, business and affairs of the department, including the operation of the railway, subject to the supervision of the commissioner. The Superintendent is authorized to engage all officers, agents and employees required to operate the railway, and conduct the business of the department, at such rates of pay as are approved by the commissioner. The Superintendent shall submit all rules and regulations for the internal management of the department for approval to the commissioner; shall discipline or dismiss employees for breaches of the regulations, subject to the employees right to appeal to the grievance committee appointed under the existing agreement with the employees, and to the further right of appeal to the Board of Commissioners, or after the expiry of the agreement to the commissioner at the head of the department. Notices and bulletins to the employees shall be approved by the commissioner, before being issued. Subject to the approval of the commissioner the superintendent may enter into agreements with the employees defining the terms and conditions of their employment, provided that all schedules of wages shall be approved by the council before they are finally adopted. The commissioner is given power to carry out the council's orders affecting the department; shall approve all proposed rules and regulations for the internal management of the department, and is to report on all questions of policy to the Board of Commissioners, which shall be finally decided by the city council. All expenditures on capital account are to be settled by the city council; the construction of new lines or the alteration of existing lines have to be approved by the council, and questions involving the working up of any deficit or the disposal of a surplus shall be decided by the council.

Montreal Tramways Co. manufacturing ammunition.—The Montreal Tramways Co.'s shops have been at work for some months making a number of parts of shells for the Russian Government. The company has received recently a contract for machining and assembling eight inch howitzer shells to the value of over \$1,000,000, and it is expected that further orders will follow. The machinery necessary to turn out the number of shells mentioned within 12 months has been ordered at a cost of some \$150,000 and will be installed at the company's Youville shops.

Parcel Distribution by Street Railways.—Several cities in England, where street railways are municipally controlled, have adopted a system of parcel distribution, which adds considerably to the receipts. A report states that the receipts for the past year in Lancaster from this source were \$67,500, with a net profit of \$18,000, and an average distribution of 24,000 parcels weekly. Some horse drawn vehicles are used, but it is expected that storage battery trucks will be installed shortly.

London and Port Stanley Railway Car Barn.

The plans for the car barn at London, Ont., provide for a building approximately 220 x 88½ ft., of which the section being erected will be 145 x 88½ ft. The main part of this erection will consist of a car barn, having a frontage at the northern end of approximately 54 ft.; a length of 145 ft., and a height of 24 ft. There will be 4 sets of tracks running the entire length of the building, with the necessary pit under each set of tracks. On the west side of the car barn proper, and at the north end, will be a two story building under which will be a basement approximately 36 x 30 ft., the main entrance to which will be on the west side. The hallway, 8 ft. wide, in which will be a stairway to the second floor, will give access to an office on either side, and to the men's room and lavatory in the rear. The second floor will be divided by lath and plaster partitions into 4 rooms, with a lavatory. South of the office section and on the west side of the building, will be the transformer room, 24 x 20 ft., and further south a store room of approximately the same size. The remainder of the space will be given over to workshop purposes. The southern wall of the building will be a temporary one made of galvanized iron sheeting. The foundation work, the pits, and the main floor will be of reinforced concrete. The roof will be supported by 7 columns on the north and south ends, with 4 columns at the east and west ends connected by steel girders. The barn will be lighted by two windows in each bay of the east and west elevations, by 6 windows at the temporary south end, and by a series of lights in the monitor extending the length of the barn over the westerly bay. The inside height of the monitor from the main floor will be 28¼ ft.

Vandalism on Electric Railways.—Mention was made in Canadian Railway and Marine World for December of various acts of vandalism in suburban stations and shelters on the British Columbia Electric Ry. Similar acts are committed in practically all shelters erected at points in the suburbs and country served by electric railways throughout the Dominion. It is difficult to catch the perpetrators, but by some systematic effort by the companies and their patrons, something might be done to minimize and eventually wipe out the nuisance. The International Ry. is offering a reward of \$25 for the apprehension of persons cutting seats on its cars.

The Detroit United Ry. matters, which have for some time occupied prominent attention, pending the decision of the Detroit taxpayers as to the municipalization of the city lines, have, since the defeat of the proposals, dropped to their normal position in local affairs. The Board of Street Railway Commissioners closed its office in Detroit, Dec. 1, and accepted the secretary's resignation, but announced that for the next eight months at least, they would continue to act, but would be governed more or less by the requests of the City Council.

South East Calgary Electric Ry.—An order for the liquidation of this company was made by the Master in Chambers at Calgary, Alta., Nov. 19, under which the Trusts and Guarantee Co. (Calgary office) was appointed liquidator. Creditors were asked to send in details of their claims up to Dec. 27, and Jan. 4 was fixed as the date upon which the Master in Chambers would receive the liquidator's report.

The Toronto Ry., after considerable experimenting, has decided to equip all its cars with 24-watt Tungsten lamps. About 24,000 are being installed.

Electric Railway Projects, Construction, Betterments, Etc.

British Columbia Electric Ry.—The differences between the company's engineer and the city's engineer as to the safety for electric railway traffic of the temporary trestle at the fire damaged Connaught Bridge, Vancouver, have been practically settled. Some additional parts of the damaged steel work are being removed and additional braces are being put in. (Dec., 1915, pg. 482.)

Edmonton Radial Ry.—The City Commissioners have recommended the extension of the radial railway tracks along Brandon Ave., so as to make connection with the Edmonton Interurban Ry. tracks, at an estimated cost of \$3,000. The matter is still under consideration. (Oct., 1915, pg. 404.)

Chatham, Wallaceburg and Lake Erie Ry.—We are officially advised that the company has under consideration the construction of over 200 ft. of siding. W. Norris is General Superintendent, Chatham, Ont.

Hamilton Radial Ry.—The work of straightening the tracks in the neighborhood of the Inlet, at Hamilton, Ont., which has been in progress for some months, is reported completed. The new piece of construction cuts out some curvature and shortens the route somewhat.

Lacombe and Blindman Valley Electric Ry.—We are officially advised that the Alberta Government guaranteed the company's bonds for \$7,000 a mile for building 39.1 miles of line. The bonds were left in the hands of the Province, and the proceeds of the entire issue were subsequently placed to the credit of the Provincial Treasurer, who has paid out a considerable sum to the company as construction progressed. No work has been done on the line this year. (Dec., 1915, pg. 482.)

London and Lake Erie Ry. and Transportation Co.—We are officially advised that there is no foundation for the recent press report that the company is arranging for an extension of its line from Lambeth to Delaware, Ont. (Aug., 1915, pg. 318.)

London and Port Stanley Ry.—We are officially advised that there is under construction an extension from Richmond St. to Ridout St., London, Ont., about a mile. The car repair barns under construction, a description of which appears on another page, are expected to be completed by Feb. 1.

The bylaw for \$100,000, which London ratepayers will vote on Jan. 1, is to provide money to lay industrial spurs; to electrify the portion of the Michigan Central lines in London and St. Thomas, over which the Commission has control, and for other purposes. J. J. Callahan, London, Ont., is Manager of Transportation. (Nov., 1915, pg. 441.)

Moncton Tramways, Electricity and Gas Co.—We are officially advised that the company will probably undertake the construction of about a mile of new city and suburban track, connecting the existing lines with the suburb of Sunny Brae. It is expected that 60 lb. T rail will be used on the extension. A. B. Coryell is Superintendent Tramways and Electricity and Purchasing Agent, Moncton, N.B. (Dec., 1915, pg. 482.)

Montreal and Southern Counties Ry.—The extension of the line from St. Césaire, mileage 31-23 to Abbottsford, mileage 37-88, was opened for traffic Dec. 15. The remaining section into Granby, mileage 46-63, will be opened for traffic Jan. 15. This will give the company a through line from Montreal to Granby of 46.63 miles. (Dec., 1915, pg. 422.)

Niagara, St. Catharines and Toronto Ry.—A press report states that the company pro-

poses to erect a new steel bridge on its line in Stamford Tp. during this year.

The Dominion Parliament is to be asked, at its next session, to extend the time within which the company may build the following lines: From Port Colborne to Fort Erie, and Niagara Falls; from Niagara Falls to Niagara, and from Niagara to St. Catharines; from Welland to Brantford; an extension of the St. Catharines and Niagara Central Ry. to the Niagara River at Fort Erie, and an extension to Toronto, passing through or near Hamilton. (July, 1915, pg. 277.)

Sarnia St. Ry.—We are officially advised that the following extensions of line in Sarnia, Ont., are projected: St. Clair St. to Clifford St., and from Clifford St. to River Road, 2,500 ft. Nothing has been settled as to when these extension will be built. G. E. Wadland, Sarnia, Ont., is Manager. (July, 1915, pg. 277.)

Schomberg and Aurora Ry.—We are officially advised that the electrification of this line has been completed, and it was expected to start operating it by electric power Jan. 1. The line runs from near Bond Lake, Ont., and the Toronto and York Radial Ry.'s Metropolitan division, to Schomberg, 14.40 miles, and has hitherto been operated by steam locomotives.

Toronto Civic Ry.—We are officially advised that there is under construction a double track line on Lansdowne Ave., from St. Clair Ave. to the C.P.R. tracks, 0.634 mile.

The question of the provision of car repair shops is under consideration, and a report respecting the same is being prepared by Works Commissioner Harris. The site of the proposed shops is on the extension of the St. Clair Ave. line to Avoca Ave. (Nov., 1915, pg. 441.)

Toronto Suburban Ry.—H. T. Hazen, Chief Engineer, is reported to have stated that the Toronto-Berlin line will be opened from Lambton to Georgetown by Feb. 1, and on to Guelph by Mar. 1, making a total extension from Lambton of 45 miles. Track is laid between Lambton and Guelph, and a large portion of the overhead work is completed. An hourly service will, it is said, be given between Toronto and Georgetown, and a two hourly service between Georgetown and Guelph. Cars will, it is reported, start from north of the C.P.R. tracks on Bathurst St., Toronto, and run along the T.S.R.'s existing line, via. Davenport Road, Keele St. and Dundas St., to Lambton Park, where the new line starts. The points touched by the new line are, Lambton Mills, Islington, Summerville, Dixie, Cooksville, Meadowvale, Churchville, Huttonville, Norval, Georgetown, Limehouse, Acton, Blue Springs, Eden Mills and Guelph. The main car barn at Lambton is well advanced towards completion. There will be power transformer stations at Islington, Georgetown and Guelph. (Nov., 1915, pg. 441.)

The Windsor, Essex and Lake Shore Rapid Ry., we are officially advised, may do some paving on its lines during this year. A. Eastman is Vice President and General Manager, Kingsville, Ont. (Sept., 1915, pg. 359.)

Winnipeg Electric Ry.—We are officially advised that during 1915 the company laid 2.10 miles of new track upon various extensions in Winnipeg. (Nov., 1915, pg. 440.)

The Grand Trunk Pacific Telegraph Co. intends, as soon as financial conditions warrant, to erect additional wires throughout its system.

Regina Municipal Railway Operations.

Following are the figures for November, 1915, against those for November, 1914:

	1915.	1914.
Revenue	\$15,982.62	\$14,561.57
Operating expenses	14,659.93	15,406.23
Operating surplus	1,322.69	.....
Operating deficit .....	.....	844.66
Capital charges	8,466.61	7,476.54
Total deficit	7,143.92	8,321.20
Passengers carried	349,370	316,365
Expenses per car mile with-out power	14.53c.	15.10c.
Expenses per car mile with power	19.59c.	19.57c.
Power per k.w.h.	2.02c.	2.00c.
Power per k.w.h. per car mile	5.04c.	4.50c.
Platform wages per car hour	73.14c.	78.77c.
Expenses, percentage of earnings without capital charges	91.72%	.....
Expenses, percentage of earnings with capital charges	144.70%	.....

Electric Railway Track Laid in 1915.

Below is a preliminary table showing track laid on electric railways in Canada during 1915. It is not published as a complete one, owing to the fact that some of the companies have not replied to the circular sent, but it is believed to be approximately correct. The * mark indicates that the figures given are estimated:

	Miles.
Brantford Municipal Ry.:	
Extensions in city	1.25
*Lake Erie and Northern Ry.:	
Brantford to Waterford, and from Waterford to Port Dover	20.40
London and Port Stanley Ry.:	
London to Port Stanley	23.60
Montreal and Southern Counties Ry.:	
St. Césaire to Granby, Que.	15.67
Montreal Tramways Co.:	
Four extensions	1.18
Peterborough Radial Ry.:	
Park St. to Monaghan Road	0.38
Three Rivers Traction Co.:	
Lines in Three Rivers, Que.	4.00
Toronto Civic Ry.:	
On Bloor St.	0.75
Toronto Suburban Ry.:	
From Lambton, mileage 1.82, to Mimico Creek, mileage 3.61	1.79
From the Speed River, mileage 45.11, to Guelph, mileage 48.29 ..	3.18
	4.97
Winnipeg Electric Ry.:	
Extensions in city	2.10
Total	74.30

The London & Port Stanley Ry., which was formerly a steam road, is included above, as it was reconstructed and electrified during the year.

The Lake Erie & Northern Ry. was originally supposed to be a steam road. The first section from Galt to Brantford, and a section from Waterford to Simcoe, together 30 miles, were laid with steel in 1913, and were included in our report on steam railway track laid in that year; the additional mileage between Brantford and Waterford, and Simcoe and Port Dover, is included in the above electric table, as the road is to be operated by electricity.

The Three Rivers Traction Co. is another new enterprise.

Accident on Montreal & Southern Counties Ry.—Following is the official report of an accident on Dec. 18:—"Car 102, leaving St. Lambert at 7.37 a.m., collided with car 103, which left Montreal at 7.20 a.m. Cars met between spans 19 and 20, Victoria Bridge, in dense fog. Car 103 was delayed on Mill St. 6 minutes, and car 102 left Front St., St. Lambert, at 7.43. Accident happened on account of misunderstanding of orders by crew of car 102." One motorman had two legs broken, and the other motorman had two legs broken. Several passengers were injured.

January, 1916.]

Answers to Questions on Electric Railway Topics.

Questions addressed to the American Electric Railway Association's Question Box, have elicited replies from Canadian electric railway officials, as follows:—

Overloading of Motors.—Electric car with four 95 h.p. motors has three pairs of 32 in. wheels and one pair 34 in. wheels. Is the motor on the 34 in. wheels overloaded?

W. R. MacRae, Master Mechanic, Toronto Ry.—In my opinion the motor attached to the 34 in. wheels is overloaded.

Life of Steel Underframes.—We are operating a lot of 36 ton cars built with 5 in. steel under frames. They have been in operation nine years and we find that the steel work is corroding badly. (a) What method has been adopted to protect the steel under frames of cars from corrosion? (b) What has the life of these frames proved to be?

M. Power, Master Car Builder, Toronto Ry.—(a) The only method I know of is to have the exposed parts properly protected by a suitable iron paint. Before applying same, the steel should be cleansed by a sand blast. When this cannot be obtained, a wire brush can be used to advantage. (b) I know of no set life of a steel car. From the experience of those using them, it appears to be little longer than wood. In order to have steel construction stand, it requires more care than wood.

Life of Car Axles.—What mileage should $4\frac{1}{4}$ in. heat treated non-keyseated car axles average under double truck four-motor car of approximately 43,000 lbs. weight?

W. R. MacRae, Master Mechanic, Toronto Ry.—At least 250,000 miles.

Car Wheel Guarantee.—What material is purchased under a contract guaranteeing cost per 1,000 car miles?

W. R. MacRae, Master Mechanic, Toronto Ry.—Car wheels.

Lighting of Suburban Stations.—We have installed at a great many of our suburban stations electric lamps fed from the trolley and feed wires. It is a problem to keep these lights in repair, have them lighted when they should be and turned off when they are not needed. We would like very much to get the experience of other companies. (a) Does good service demand that railway companies install fixed lights at suburban stations where there are no agents to care for them? (b) If so, what is the best way to protect and operate them?

C. L. Wilson, Assistant Manager, Toronto and York Radial Ry., Toronto.—Regarding the practice of installing lights at way stations, I may say that this is done only at points where we have a ticket agent or an employee acting in the capacity of an agent or watchman, and it is not customary for us to make this practice general at waiting points.

Automobiles for Employees.—Should utility companies furnish automobiles exclusively to the individual employee, or should there be a garage where cars are subject to assignment?

F. G. Clark, Chief Engineer, Toronto Ry.—The furnishing of automobiles depends largely upon local conditions and the type of organization. Our practice is as follows: Certain officials have cars and drivers furnished for their exclusive use. These cars are kept in the company's garage, and if there happens to be an emergency requirement, the superintendent of garage calls upon the officials to find if the cars may be used for a specific purpose and for a given length of time. Certain other cars are designated for the use of certain officials and are the cars usually used by these men, be-

ing driven by them and to a certain extent are under their care. These cars may be used by the garage superintendent for certain emergencies without the permission of the men who ordinarily use the cars, but for ordinary service are not to be taken out of the garage except by permission of the men to whom they are assigned. Certain other cars are for general use and are assigned upon requisition and are charged for with or without a driver, as would be the case with any livery or public garage.

Competition on Contracts.—How many proposals are necessary on a contract to get full benefit of competition?

F. G. Clark, Chief Engineer, Toronto Ry.—The number of proposals necessary to get the benefit of competition depends upon the nature of the contract, the apparatus and material being purchased, the standing of the companies competing for the contract, etc. In some cases, competition is unnecessary to get proper results; in other cases, two proposals are sufficient, and in certain others, a considerable number of proposals may be desirable. Suitable knowledge of the requirements of the case and common sense appear to be what are necessary in this connection.

Electric Railway Finance, Meetings, Etc.

Brantford Municipal Ry.—The Brantford City Council is applying to the Dominion Parliament for authority to carry on the Grand Valley Ry. under the name of the Brantford Municipal Ry., with all the powers of the G.V.R., and the power to sell any portion of the same absolutely or conditionally, subject to the Board of Railway Commissioners' approval.

British Columbia Electric Ry., and allied companies:

	Oct. 1915	Oct. 1914	July 1 to Oct. 31, 1915	July 1 to Oct. 31, 1914
Gross earnings	\$38,826	\$361,000	\$2,073,095	\$2,679,351
Expenses	180,051	511,877	1,328,330	2,060,681
Net earnings	58,775	149,123	145,167	618,670

The percentage due to the City of Vancouver for November was \$3,323.14, against \$6,145.51 for Nov., 1914. The number of passengers carried on the city and suburban lines for November was 2,269,542, against 2,611,978 in Nov., 1914.

Cape Breton Electric Co.

	Oct. 1915	Oct. 1914	July 1 to Oct. 31, 1915	July 1 to Oct. 31, 1914
Gross earnings	\$84,152.20	\$50,751.49	\$122,536.88	\$122,753.15
Expenses	16,891.18	18,324.05	70,900.79	73,491.06
Net earnings	17,261.02	12,227.46	61,436.09	49,262.09

Edmonton Radial Ry.—The Mayor of Edmonton, Alta., at the annual public meeting for the discussion of civic affairs, Dec. 1, made a statement as to the city's finances, in the course of which he said: "In the street railway department a decided improvement has taken place, resulting in a very large decrease of the deficits. The total operating expenses and capital charges for the 10 months were \$547,263, a saving over 1914 of \$186,521. The deficit showed a reduction of \$63,506 for 1915, as compared with the corresponding period of last year. Since August the department had been making a decided better showing, and it was clear that under proper handling and normal conditions the system would pay its own way."

Guelph Radial Ry.—Guelph, Ont., press dispatch, Dec. 15: "The Radial Railway Board has paid the City Treasurer more than \$10,000, the surplus over operating expenses from the street railway for 1915. This figures out at 6% on the amount the city has invested in the railway. A few shares were taken over recently from pri-

vate holders, and from these the amount may be made even larger. This is an increase of more than \$2,000 over the amount that the railway earned for the city in 1914."

London and Port Stanley Ry. Earnings.—

An estimate of net earnings for six months ended Dec. 31, 1915, states that they will amount to \$10,277.64. During July and August, 65,739 and 89,529 passengers were carried respectively.

London St. Ry.

	Nov. 1915	Nov. 1914	Jan. 1 to Nov. 30, 1915	Jan. 1 to Nov. 30, 1914
Gross earnings	\$91,843.90	\$29,057.50	\$692,199.36	\$631,395.06
Expenses	22,085.48	21,089.50	259,755.85	243,416.06
Net earnings	69,758.42	7,968.00	432,443.51	387,979.00

Toronto Ry.—The receipts from Jan. 1, and the percentages paid to the city, for 1915, compared with those for 1914, are as follows:

	1915	City percentage	1914	City percentage
January.....	847,226	870,185	\$501,844	\$555,255
February.....	446,314	66,491	461,274	73,638
March.....	488,468	36,141	510,531	102,150
April.....	467,702	93,540	501,435	100,284
May.....	468,954	93,791	534,406	106,896
June.....	450,582	90,116	515,883	103,177
July.....	449,108	89,822	507,912	101,582
August.....	447,369	39,166	525,295	42,091
September.....	489,553	36,935	487,689	39,274
October.....	461,685	46,301	465,055	46,563
November.....	472,729			
	\$5,108,238	\$808,339	\$5,537,088	\$804,520

Toronto Ry., Toronto and York Radial Ry., and allied companies.

	Oct. 1915	Oct. 1914	Jan. 1 to Oct. 31, 1915	Jan. 1 to Oct. 31, 1914
Gross earnings	\$792,001	\$849,656	\$7,942,406	\$8,471,744
Expenses	358,957	426,536	3,566,309	4,333,990
Net earnings	433,044	423,120	4,376,097	4,137,754

Winnipeg Electric Ry.

	Oct. 1915	Oct. 1914	Jan. 1 to Oct. 31, 1915	Jan. 1 to Oct. 31, 1914
Gross earnings	\$286,146	\$330,562	\$2,799,595	\$3,407,362
Expenses	181,176	195,465	1,848,025	1,970,095
Net earnings	104,970	135,097	951,570	1,437,267

Winnipeg, Selkirk, and Lake Winnipeg Ry. Bonds.—The Dominion Securities Corporation, Toronto, has issued a circular from which the following is reproduced:—

In 1905 we marketed \$400,000 1st mortgage bonds of the Winnipeg, Selkirk & Lake Winnipeg Ry. Co., the price then representing approximately a 4.70% basis for 5% bonds, due July 1, 1933. The company completed recently and put into operation 17½ miles of additional road, making a total mileage of approximately 40 miles. In order to repay advances made by the Winnipeg Electric Ry. Co. (which owns the entire capital stock of the Winnipeg, Selkirk & Lake Winnipeg Ry. Co.), and to provide for redemption of the above mentioned mortgage bonds, \$1,400,000 of 5% general mortgage and refunding bonds have been issued, dated July 1, 1915, and maturing July 1, 1925—these bonds having been guaranteed both as to principal and interest by the parent company. We have already arranged for the redemption of the greater portion of the first mortgage issue—over \$300,000—practically all holders of these bonds having taken the new bonds in exchange. After reserving sufficient new bonds to retire the present small outstanding portion of the first mortgage issue, we offer the now unsold balance of approximately \$700,000. The bonds are offered at 92.56, and interest will therefore yield 6%.

Passenger Shelter at Sunnyside, Toronto.

The question of providing a shelter at the junction of the Toronto Ry. and the Toronto and York Radial Ry. at Sunnyside came before the Ontario Railway and Municipal Board, Dec. 1, and it was arranged that a heated car will be provided temporarily, the cost to be borne equally by the railways and the city. The portion of the Toronto and York Radial Ry. concerned, formerly the Toronto and Mimico Ry., was nominally acquired by the city on the expiration of the franchise some time ago, but no money has passed, and it is being operated by the T & Y.R.R. at the city's request.

Mainly About Electric Railway People.

W. H. Maxwell has been appointed Roadmaster, Montreal & Southern Counties Ry., Office, St. Lambert, Que.

H. B. Fleshman, Maintenance of Way and Structures Engineer, Montreal & Southern Counties Ry., St. Lambert, Que., has resigned.

G. J. Meyer, heretofore Electrical Engineer, Montreal & Southern Counties Ry., has been appointed Chief Engineer. Office, St. Lambert, Que.

N. H. Brown, Superintendent of Transportation, Buffalo Division, International Ry., Buffalo, N.Y., has been appointed General Manager of Transportation.

Duncan MacDonald, ex General Manager, Montreal Tramways Co., and now one of the Montreal city controllers, will, it is said, be a candidate for the mayoralty this year.

J. H. McNeil, who had charge of the construction of the Three Rivers Traction Co.'s line in Three Rivers, Que., has been appointed acting Superintendent in charge of operation.

Mrs. Rothery, of Weston, Ont., is suing the Canada Accident and Guarantee Co. for \$15,000, alleged to be due under a policy on her late husband, J. E. Rothery, formerly Manager, Toronto Eastern Ry.

W. G. Murrin, General and Mechanical Superintendent British Columbia Electric Ry., has been appointed Chairman of a sub-committee of the Vancouver Returned Soldiers' Welcome Committee.

G. D. Archibald has been appointed Superintendent, Saskatoon Municipal Ry., Saskatoon, Sask. For some time past the duties of Superintendent of the municipal railway have been carried out by E. Hanson, City Electrician.

Mrs. J. C. Grace, wife of the Secretary Treasurer, Toronto Ry. Co., died suddenly at Toronto, Nov. 30, from cerebral hemorrhage. She was a sister of the late Jas. Ross, of Montreal, and an aunt of J. K. L. Ross, one of the C.P.R. directors.

Lt. Col. G. D. Fearman, Chief Accountant, Dominion Power and Transmission Co. of Hamilton, Ont., has been appointed to the command of the 120th Battalion, but still retains his position with the company. His assistant, G. N. Kendall, is discharging the duties of Accountant.

Major Geo. C. Royce, General Manager, Toronto Suburban Railway, who has been in command of the Depot Battalion at Toronto Armories, has been appointed commandant of the camp for interned alien enemies at Kapuskasing, Ont., on the National Transcontinental Ry., with the rank of Lieutenant Colonel.

James D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Ry., and President, Canadian Street Railway Association, who has recovered recently from a severe attack of la grippe, was to leave Ottawa, Dec. 30, with Thos. Ahearn, President, Ottawa Electric Ry., for a short trip to Havana and other southern points.

A. C. Johnston, who has succeeded J. E. Richards as Accountant, Chatham, Wallaceburg & Lake Erie Ry., Chatham, Ont., commenced railway work with the Canadian Northern Ry. in Dec., 1896, leaving in 1904 to enter the Lackawanna Steel Co.'s service at Buffalo, N.Y., where he remained for several years, returning to the Canadian Northern in June, 1912.

Col. H. H. McLean, K.C., M.P. for Queens-Sunbury, N.B., and President, St. John Ry. Co., who commanded a cavalry brigade at Valcartier during last summer, has been ap-

pointed a special recruiting officer for the Maritime Provinces, and will assist in raising battalions there. Later on he will probably be sent to the front in command of a brigade.

Edward L. Cousins, A.M.Can.Soc.C.E., one of the engineers entrusted with the preparation of a report on a proposed rapid transit system for Toronto, which appears, with his portrait, elsewhere in this issue, was born at Toronto, June 11, 1883, and was educated at the public schools there, St. Andrew's College, and Toronto University, graduating B.A.Sc. in 1907. From 1902 to 1907 he was assistant engineer, Resident Engineer's office, G.T.R., Toronto; 1907 to 1910, Engineer in Charge Middle Southern Division, G.T.R., Toronto; 1910 to 1912, Assistant City Engineer, Department of Railways, Bridges and Docks, City of Toronto. In 1912 he was appointed Chief Engineer, Toronto Harbor Commissioners, which position he still holds.

Manfred Freeman was elected Public Utilities Commissioner for Lethbridge, Alta., Dec. 13, by a majority of 36 over Arthur Reid, who held the office for the last term. Three candidates went to the poll, with the result that Reid received 410 votes, Freeman 319, and McKenzie 246, but as the retiring Commissioner did not receive 51% of the votes polled, a counting of the second choice ballots was necessary, the name of the third candidate being eliminated. The second choice ballots gave Freeman 152 votes and Reid 25, giving Freeman a total of 471 and Reid 435. Mr. Freeman is a native of Hamilton, Ont., and has lived in Lethbridge since 1890. He was at different times Chief Engineer, Manager, and Secretary of the Lethbridge Waterworks and Electric Light Co., during its existence as a private company. As Public Utilities Commissioner he has charge of the Lethbridge Municipal Ry.

Electric Railway Notes.

Moose Jaw Electric Ry., Moose Jaw, Sask., has ordered a rotary circulating water pump in the United States.

The **Sarnia St. Ry.** may be in the market for about 5,000 ft. of 60-lb. rails early in the spring. G. E. Wadland, Sarnia, Ont., is Manager.

The **Windsor, Essex and Lake Shore Rapid Ry.** has become a party to the Eastern Canadian Passenger Association's certificate plan regulations.

The **British Columbia Electric Ry.** issued an order, effective Dec. 15, reducing the service on the Lulu Island and Burnaby Lake lines from one car an hour to one car every two hours.

The **British Columbia Electric Ry.** received entries up to Dec. 15, in a competition for a design emblematic of supplying transportation, light, power and heat. Prizes of \$50 and \$25 were offered.

The **Manitoba Court of Appeal** started on Dec. 15 hearing the **Winnipeg Electric Ry.**'s appeal against Judge Metcalfe's decision that the company must pay for clearing snow from the tracks when ordered to do so by the City Engineer.

The **British Columbia Electric Ry.**'s office staff's annual dinner was held in Vancouver, Dec. 4, G. Kidd, General Manager, being present. The speeches were chiefly of a complimentary character, but special reference was made of the fact that 144 of the company's employes are in the Canadian Overseas Expeditionary Forces.

A cablegram from London, Eng., Dec. 20, to the city attorney of Montreal, stated that the application of D. Robertson, Purchasing Agent, Montreal Tramways Co., for permission to appeal to the Imperial Privy Council to have the franchise of the Canadian Automobile Co. declared illegal had been refused. The action has been before the courts for some two years.

The **Sandwich, Windsor and Amherstburg Ry.** has received two single truck city cars from the Preston Car and Coach Co. They are mounted on 21-E trucks, and are single end, p.a.y.e. type, with longitudinal seats upholstered in pantasote, folding steps, mutually operating doors under the control of the conductor and motor man, and equipped with sign boxes and forced circulation heaters.

The only decision rendered to date in the various suits arising out of the Montreal tramways franchise matter is one brought by J. A. Thibeaudeau to have Controller McDonald unseated. The decision was rendered by Justice Lafontaine, Dec. 2, the petition being dismissed with costs. The other actions are still before the courts. Ex Controller Hebert, who was the central figure of the disputes, has made an assignment to his creditors, and is reported to be seriously ill.

An Alberta court on Dec. 7 granted an injunction restraining the **Edmonton City Council** from entering into an agreement with the **Edmonton Power Co.**, granting a franchise for the supply of power in the city. The agreement was endorsed by the ratepayers, but the third reading of the bylaw was defeated in the City Council Nov. 24, by the casting vote of the Mayor, and referred back for further consideration. The case came up for hearing Dec. 10, and was concluded on the following day, when Judge Hyndman decided that the bylaw could be passed by the council, and accordingly dissolved the interim injunction. The bylaw, he said, did not confer a franchise, but was simply an agreement to go to the Legislature, asking it to sanction the granting of a franchise, the terms of which had been arranged.

One-Man Cars in Calgary.—The **Calgary Municipal Ry.** has placed some one-man cars in operation running from the city centre to outside points, as an accommodation where large cars with two men would not pay. Five of the one-man cars are being operated largely on inside and stub lines satisfactorily, and it is proposed to operate more of them at rush hours on long hauls where only one trip will be made. These cars are single truck p.a.y.e., 6 ft., rear vestibule type, and have been converted by closing up the rear end and making it into a smoking room seating 10 passengers, and by adding one additional seat in the body, where 28 passengers are seated, the total capacity being 38 passengers. The front bulk head door has been removed, and also the window, which is used as a wicket, the fare box being inside this window. We are indebted to T. H. McCauley, Superintendent, for these particulars.

Toronto Ry. and Overcrowding.—Information was received in Toronto, Dec. 21, that the Imperial Privy Council had granted the **Toronto Ry. Co.** leave to appeal against the Ontario Appeal Court's decision confirming the conviction for maintaining a nuisance in permitting overcrowding of cars.

Dominion Power and Transmission Co.—W. C. Hawkins, Managing Director, is reported to have stated that the **Hydro Electric Power Commission of Ontario** is not negotiating for the company's electric railways and power plants.

Marine Department

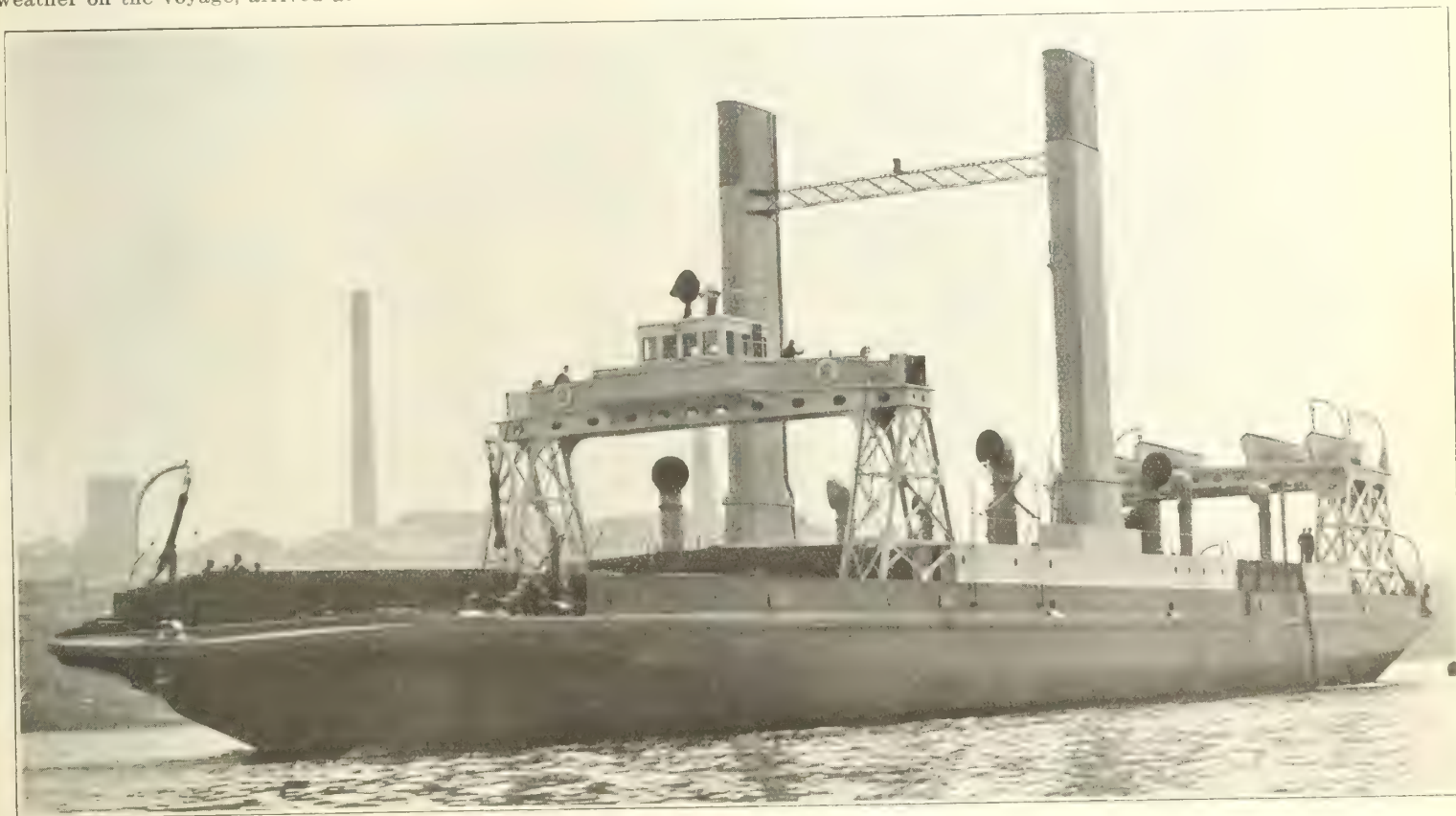
Intercolonial Railway's Car Ferry Steamship, Scotia 2.

A very complete advance description of this vessel was published in Canadian Railway and Marine World for Nov., 1913. The route which she is to serve is the trying one which traverses the Strait of Canso, between the mainland of Nova Scotia and Cape Breton Island. There is considerable ice-flow along this route in winter and, therefore, the Scotia 2 has been constructed to break up the ice, in order to keep the passage open for railway service. The vessel, which has several interesting features, left the Tyne Aug. 31 last, under the command of Capt. Manning, and, in spite of heavy weather on the voyage, arrived at Port Mul-

duced in order to break up the ice in front arrangement aft is for a single screw propeller with the ordinary rudder. The hull is specially strengthened at the water line, fore and aft, and water ballast tanks are arranged at the forward and after ends. These can quickly be filled in order to increase where necessary the downward thrust for the breaking up of the ice.

To facilitate navigation, a superstructure has been built. This gives a clear headway for the railway cars traversing the track on the deck, and affords a good outlook for navigation purposes. The pilot house on the navigation bridge contains the steam steer-

of one large mess room, four rooms for the officers and engineers, one for the steward, two separate rooms for the day and night captains, and two for the chief engineers. The crew's quarters include a mess room, one room for 6 seamen, and one for 8 firemen. A complete installation of electric light is fitted throughout the vessel. The generating machinery consists of two direct coupled plants, each capable of giving an output of 25 kw. at 80 volts, when running at a speed of 350 revolutions a minute. A searchlight of 20 in. diameter and 16,000 candle power, is fitted on top of the pilot house, with the necessary controlling



Bow View, Car Ferry Steamship, Scotia 2.

grave, N.S., Sept. 15, proving the structural strength of the hull and the fact that vessels of this character can safely cross the Atlantic. The principal dimensions are:—

Length over all	300 ft. 0 ins.
Length between perpendiculars ...	286 ft. 6 ins.
Breadth, extreme, over fenders	50 ft. 0 ins.
Depth, moulded	20 ft. 0 ins.
Draught of water	14 ft. 2 ins.
Displacement at 14 ft. 2 in. draught	3665 tons

The vessel is of the single deck type; and increased strength has been introduced in the framing of the deck in order to support the weight of heavy locomotives on the centre track. The vessel conforms to the conditions of Lloyd's highest classification and also with British Board of Trade requirements. The main deck has three lines of track laid to standard 4 ft. 8½ in. gauge, and the cars will be shipped and discharged over the forward end only. The four bunkers with which the vessel is fitted are so arranged that they can be loaded from cars on the railway track on deck. The fore part of the vessel is of the ram form, intro-

duced in order to break up the ice in front arrangement aft is for a single screw propeller with the ordinary rudder. The hull is specially strengthened at the water line, fore and aft, and water ballast tanks are arranged at the forward and after ends. These can quickly be filled in order to increase where necessary the downward thrust for the breaking up of the ice. To facilitate navigation, a superstructure has been built. This gives a clear headway for the railway cars traversing the track on the deck, and affords a good outlook for navigation purposes. The pilot house on the navigation bridge contains the steam steer-

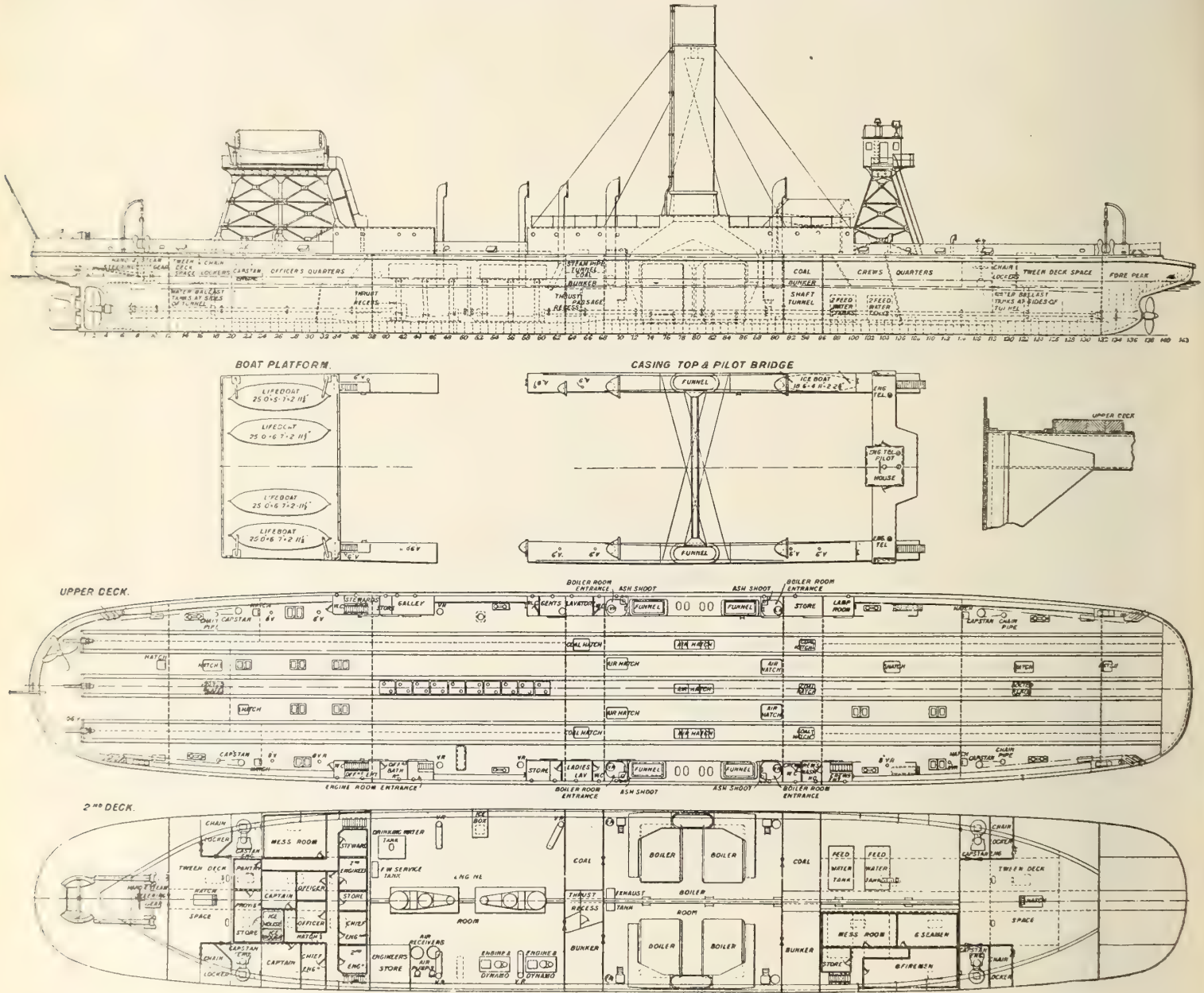
gear and connections therein. There are 8 electric fans fitted in the stokehold and engine room ventilators. An air compressing plant, consisting of two Westinghouse air pumps, with receivers, is placed in the engine room. Connections are led to each end of the vessel for providing power for pneumatic tools used for effecting repairs to the hull or machinery.

The propelling machinery is fitted amidships and consists of two sets of engines on the fore and aft line, the forward engines being arranged to work the bow propeller, and the after engines the stern propeller. A suitable coupling was fitted so that the two engines may work either together or independently. The engine room ventilators are placed in the wings, in order to afford the maximum of deck space for the accommodation of the railway trains. The boilers are also arranged in the wings of the ship, enabling the uptake to be easily and suitably connected to funnels at the side of the ship. There are 4 single ended boilers.

which are each $15\frac{1}{4}$ ft. in diameter by $10\frac{3}{4}$ ft. long, constructed for a working pressure of 160 lbs. per sq. in. under natural draught. More than adequate tube surface is provided, as a considerable amount of heating is required for ship's purposes, and special connections are led from the boilers to various parts of the ship. Each boiler has an independent connection with the main steam pipe, so that any one boiler may be put out of action. The coal bunkers are ar-

ly 21, 34 and 54 ins. in diameter, with a stroke of 30 ins. The crank shafts are of the built up type, $10\frac{3}{4}$ ins. in diameter, each shaft being in 3 interchangeable pieces. The thrust shafts are of forged ingot steel, $10\frac{3}{4}$ ins. in diameter. The thrust blocks are of cast steel of special design, to withstand shock; the line shafting is also forged ingot steel, 10 ins. in diameter, and the propeller shafts are of forged ingot steel, 12 ins. in diameter. Each propeller has 4 blades, and

the general service pumps and other auxiliaries. The whole of the auxiliaries connected with the propelling machinery are placed on the port wing, the starboard wing being reserved for the electric generating set, air pumps, and air receivers, for ship service, and for engineer's stores. The machinery was designed to indicate 3,000 horse power, and on trial this was easily attained. The foregoing description is reproduced from Shipping Illustrated. The car ferry



Longitudinal Section and Deck Plans, Car Ferry Steamship, Scotia 2.

anged at the forward and after ends of the boiler rooms, and these are filled from hatches from the upper, or train, deck. The main engines have been designed and constructed in accordance with experience for this type of vessel, and special consideration has been given to provide against the shocks due to sudden stoppages of the propellers when working against ice. The engines are of the single screw, triple expansion, inverted direct acting surface condensing type, each working on three cranks. Normally they will be coupled up to work together the bow and stern propellers, but there is a short portable length of shafting between the two engines, by the withdrawal of which they can be operate independently. The cylinders in each engine are respective-

ly made of nickel steel, extra thick, for working amongst ice. There is one condenser common to the two engines. It is placed on the port side centrally, being carried on the columns of the two high pressure cylinders. The method of support simplifies greatly the exhaust pipe arrangement from each of the low pressure cylinders. The air pumps are separate, and are $18 \times 10 \times 15$ ins. Two sets of independently driven $12\frac{1}{2}$ in. centrifugal pumps are fitted; one of them is sufficient for the maximum duty, the other serving as a standby. The feed pumps are located at the forward end of the main engine room on the port side. These are $7 \times 9\frac{1}{2} \times 24$ ins. stroke. Alongside are placed the fire and bilge pumps, which are $7\frac{1}{2} \times 7\frac{1}{2} \times 6$ ins. stroke, while in the wings are

has been built by Sir W. G. Armstrong, Whitworth & Co., Walker Shipyard, Newcastle-upon-Tyne, Eng.

A view of the cross section of this vessel is given on the next page.

Canada Steamship Lines, Ltd., according to press dispatches, during the past season effected a saving in operating charges of approximately \$420,000, to the end of September, and it is stated that when the accounts for the complete season are made up, the saving will be over \$440,000. This saving, it is said, is more than sufficient to provide the full interest on the debenture stock and a portion of the preference dividend.

January, 1916.]

The Canadian Atlantic Ocean Mail Port.

As announced in Canadian Railway and Marine World for December, the schedule of Atlantic sailings for the C.P.R. mail steamships for the winter shows St. John, N.B., as the Canadian port. In previous years a call was made at Halifax, N.S., where mails were landed, after which the vessels proceeded to St. John. The decision to make St. John the sole port this winter has aroused considerable opposition in Halifax, and immediately the official announcement was made the matter was taken up by the Halifax Board of Trade, and the Dominion Premier was appealed to with the view of getting Halifax reinstated as a port of call. The Premier promised to interview the President of the C.P.R., and as a result received the following letter from Sir Thos. Shaughnessy explaining the company's attitude:—

"I wish that it were possible to comply with your request to have our passenger ships call at Halifax on the inward and outward trips this winter, but as I said to you personally, I am convinced that it cannot be done in the interest of the country. The war has brought upon us a condition of things with reference to our Atlantic steamship service, that could not have been foreseen, and that it will be difficult for us to satisfactorily meet, even with our greatest efforts. As you know, a great many of our ships have been taken by the Admiralty, and we have found it impossible to charter a sufficient number to replace them. In these circumstances, we must either utilize such steamships as are available to the utmost, or we must permit a substantial percentage of our Canadian exports to be diverted from our Canadian ports. Apart from all other considerations, the Halifax call would involve a delay to our passenger ships of from two to three days on each round voyage, with a like reduction in their freight carrying efficiency. Our endeavor must be this winter to avoid unnecessary detention of a single hour, so as to secure the fullest advantage of their carrying capacity. By running direct to and from St. John, in these exceptional circumstances to which I have referred, no precedent is being established. When normal conditions return, the Halifax mail service and the terms upon which it is to be conducted, will be open for consideration."

This letter was discussed at a public meeting at Halifax, together with a letter from Sir Robt. Borden, wherein he stated that "under the circumstances the Government will take into immediate consideration the forwarding of mails by the Admiralty transports sailing to and from Halifax during the winter."

As a result of the discussion a telegram was sent to the Premier, stating that both communications were considered unsatisfactory, and alleging that the contention that vessels would lose three days on each round trip cannot be borne out by facts. In backing up this statement, it is stated that the vessels work on a 35 day schedule for the round trip, and that it can be done in 34 days, including the call at Halifax. This is explained as follows:—Liverpool to Halifax, 10 days; stop at Halifax, 1 day; Halifax to St. John, 1 day; stop at St. John, 5 days; St. John to Halifax, 1 day; stop at Halifax, 1 day; Halifax to Liverpool, 10 days; stop at Liverpool, 5 days; total, 34 days.

The Premier subsequently replied to the Board of Trade stating that no subsidy arrangements had been made with the C.P.R. for the winter, and that the company can, of course, control the destination of its vessels, but that the Government controls the disposition of subsidy, an equal portion of

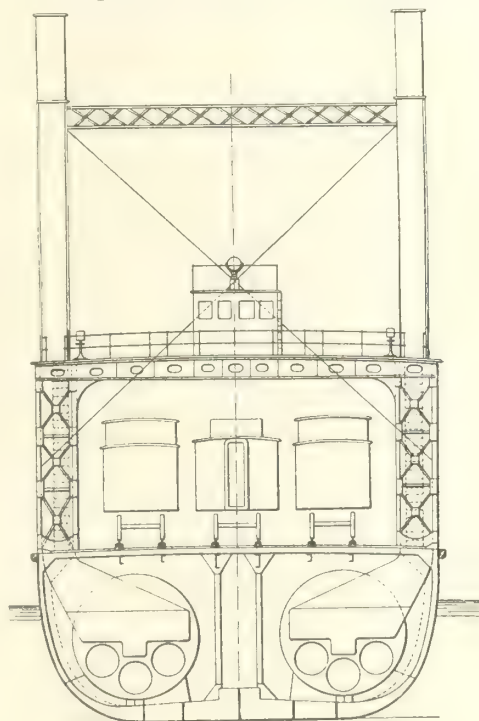
which will be allocated to the direct transmission of mails to and from Halifax by the best vessels that can be procured.

A further meeting was called at Halifax to discuss the whole situation, and a resolution was passed protesting against the elimination of Halifax from the mail route, and calling upon the Government to compel mail steamships to call there.

On Dec. 3, a deputation waited on the Premier, Minister of Trade and Commerce, Minister of Railways and Canals, and the Postmaster General, to press the Halifax protest, and was given to understand that the matter will be taken up again with the C.P.R., and that the Government will do everything possible to get the company to continue the Halifax call.

The Loss of the s.s. Constance.

An investigation into the cause of the loss of the s.s. Constance, which foundered in the Gulf of Georgia, Oct. 2, 1915, was held at Vancouver, B.C., recently, by Capt. J. D. Macpherson, Wreck Commissioner for



Cross Section, Car Ferry Steamship, Scotia 2.

British Columbia, assisted by Commander C. Unwin, R.N.R., and Capt. R. C. Proctor, as nautical assessors. Following is the judgment:—The evidence was in most instances of a most contradictory and evasive nature, that of the master, Harry Smith, being particularly so. The court is unanimous in its opinion that the loss was solely due to the Constance being, under her master's direction, improperly loaded to such an extent that she was unable to cope with the heavy weather met with when she got into the Gulf of Georgia. It is also of the opinion that the master showed little judgment and less prudence in not seeking shelter under the existing conditions, before it was too late, more especially as not only had he 6 extra persons on board, which he somewhat ingeniously described as stowaways, but he had also a gasoline launch in tow, with 7 persons on board, making a total of 13 persons, in addition to his own crew, whose lives and personal belongings were under his charge. The court therefore considers the master solely to blame for the loss of the Constance, and suspends his certificate of competency as master, no. 3299,

for 3 months, from Oct. 2, 1915, to Jan. 2, 1916. The court considers that it has shown a considerable amount of leniency to the master in suspending his certificate for this period only, but it has taken into consideration the fact that he has lately been fined \$100 in the Vancouver police court for carrying the 6 persons before mentioned on board the Constance, when she was not licensed to carry passengers, thus contravening sec. 671, chap. 113, part 7 Canada Shipping Act. Had this fine not been imposed the court would have suspended his certificate for a considerably longer period, not only for the reasons already mentioned, coupled with the evasive and unsatisfactory manner in which he gave his evidence, but also as a warning and a deterrent to all interested in the shipping business on this coast, that the laws as laid down in the Canada Shipping Act cannot be violated with impunity.

Decision as to Use of Family Tickets.

The right of a ferry company to determine the extent of use of a family ticket was upheld by Chancellor Boyd in Toronto recently, on a motion by the Village of Fort Erie to have the Fort Erie and Buffalo Ferry Co. act upon a decision of the trial judge, who, on the asking of the village, compelled the ferry company to revert to an old custom. Under regulations the company was bound to provide residents with family tickets, but when the company found that the public were abusing the privilege by permitting others than members of a family to make use of the tickets, they imposed certain restrictions. The village took action and got a verdict against the company. Chancellor Boyd agreed that the whole question rested upon the interpretation of the word "family," and he decided that "family" in the sense intended by the ferry company meant parents and children of parents living in one home. Servants, he decided, were barred from use of a family ticket, and he found for the ferry company, which has the right to name those who should use such tickets.

Wreck Commissioners' Investigations in 1914.—During 1914, 26 formal, 10 preliminary and 1 departmental investigations into causes of wrecks and marine casualties were held. As results of these, 3 masters' certificates were suspended for one month, 2 for three months, 1 for six months and 1 for a year; 1 master was fined and 9 reprimanded or censured. Two mates' certificates were suspended for three months, 1 mate was cautioned and 1 exonerated; 2 second mates' certificates were suspended for three months, 1 cautioned and 1 exonerated; 3 pilots' certificates were suspended for three months, and 1 was cancelled. Regarding four wrecks, no blame was attributed. The total casualties were to 257 vessels of 212,842.85 tons, and the loss of \$5,211,700 and 1,114 lives.

The Interstate Commerce Commission and Lake Traffic.—In connection with the recent cases dealt with by the Interstate Commerce Commission under the Panama Canal Act, whereby railway companies operating in the United States have been compelled to cease ownership of lake lines, the commission on Nov. 30 dismissed applications on behalf of seven of the companies concerned, for a rehearing involving permission to continue such operation, and making the order to discontinue, effective Dec. 15. The railway companies affected are Pennsylvania Rd., Northern Central Ry., New York Central Rd., Erie Rd., Grand Trunk Ry., Lehigh Valley Rd., and Delaware, Lackawanna and Western Rd.

Hudson Bay Navigation and the Port of Quebec.

J. G. Scott, ex-General Manager, Quebec and Lake St. John Ry., has written to the Quebec Chronicle, defining his attitude on the matter of the navigation of Hudson Bay, on the completion of the Dominion Government's railway from Pas, Man., to Port Nelson, and of the harbor at the latter place. He says:

"At the Board of Trade's general meeting yesterday, Mr. Nesbitt drew attention to the fact that the railway to Port Nelson is to be finished next year, that the terminals at Port Nelson are to be pushed to completion, and that it is said to be the intention of the Government to put on a line of steamships, specially built to contend with the ice, so as to carry the western grain through Hudson Straits to Europe, and that, therefore, we, in Quebec, should insist upon our port being properly equipped with docks and elevators, so as to be ready to handle our share of the business coming over the National Transcontinental Ry. As your reporter does not seem to have fully understood what I said in reply, will you allow me to repeat, namely, that I thought that as the Government had built the railway in response to the pressure of public opinion in the west, it is only reasonable that they should give the project every opportunity to prove its usefulness or otherwise. I pointed out that it would seem to be in the interests of Quebec that the Government should build those ice breaking steamships because, even if the experience of navigating Hudson Straits for two or three months in the year should be successful, the steamships would then be available all the rest of the year for the St. Lawrence route, because any steamships able to cope with the ice in Hudson Straits in September and October would have no trouble in coming up the St. Lawrence to Quebec, all through the winter.

"The great difficulty that Canadian ports have to contend with is the high rate of marine insurance. It is true that the rate from Quebec, Halifax and St. John is 10% cheaper than from Montreal. Nevertheless, it is still so high that steamships charge much higher rates for freight from Canadian than from United States ports. The consequence is that half the grain from our western provinces went by the U. S. route last year, and more than half is going this year. The improvements of the lower St. Lawrence are helping to reduce the insurance rates. The new deep channel, now nearly completed, east of the Island of Orleans, will help still further. If the Government will guarantee the marine underwriters in making our St. Lawrence rates the same as New York all the year round, and will show their confidence in the route by putting on the steamships now spoken of, the battle will be won, and Canadian ports will handle all the Canadian grain that is intended for export instead of seeing the humiliating spectacle of 63,000,000 bush. of it diverted to Buffalo, as was done last year. But, as Mr. Nesbitt says, we must have docks and elevators to handle the traffic, or we won't get it."

German Vessel Tonnage.—At the annual meeting of one of the British steamship companies recently, it was announced that of the 5,459,296 tons of German shipping existing at the commencement of the war, 230,000 tons have been captured by the British Navy; 38,000 tons by other allies; 117,000 tons have been sunk, and 397,000 tons interned in various British ports. The remainder, with the exception of a few small traders in the Baltic Sea, are detained in German harbors, or interned in neutral ports.

Dominion Government s.s. Minto for Icebreaking Service in Russia.

The Dominion Government s.s. Minto has followed the s.s. Earl Grey, for service in the White Sea in keeping the port of Archangel open for navigation throughout the winter. The Minto was specially designed for ice service between Prince Edward Island and the mainland, and was built at Dundee, Scotland, in 1899. She is of steel and classed 100 A1 at Lloyd's. Her dimensions are, length between perpendiculars 225 ft., breadth moulded 32.7 ft., depth moulded 21 ft.; tonnage 1,090 gross, 496 register. For her special ice service she was constructed with extra heavy scantlings for the keel, stern, stern frame, keelson and stringer plates, these being about 50% heavier than required by Lloyd's, and similar strengthening was provided at other points where experience had shown that it was required. There is a cellular double bottom from the forward bulkhead in the fore hold under the boilers and engines to the after bulkhead of the engine room, all made 6 ins. deeper than customary for better cleaning room. The hull is divided into compartments by seven watertight bulkheads, and the shaft tunnel is fitted with a watertight sliding door. Accommodation is provided for seamen and firemen in 20 berths under the forecastle deck, and the officers' quarters are arranged in the deckhouse, as is also the passenger accommodation.

The propelling machinery consists of direct acting surface condensing tri-compound engines with 3 inverted cylinders, 216 n.h.p. and 2,900 i.h.p., supplied with steam by 2 double ended cylindrical return tubular boilers at 160 lbs. Other machinery equipment includes steam and hand steering gear, donkey engines and complete electric lighting system for 150 lights and large searchlight.

The official report concerning the operation of the Minto for the fiscal year 1914-15, states that she made 60½ round trips, carried 14,526,314 lbs. of freight, 476,410 lbs. of express matter, 3,186 passengers, and provided 2,963 meals and 1,118 berths to passengers; with total earnings of \$18,049.33. During the summer of 1914 she was sent to Hudson Bay ports for the Government, and in the winter of 1914-15 she was run between Pictou, N.S., and Georgetown, P.E.I.

Judgment re Insurance, Empress of Britain-Helvetia Collision.

Judgment was given recently in the Court of Appeal, London, Eng., on a matter affecting insurance in connection with the collision between the C.P.R. s.s. Empress of Britain and the British Chilean Steamship Co.'s s.s. Helvetia, under charter to the Dominion Coal Co., in the St. Lawrence River in 1912. The appeal was on behalf of the Helvetia's owner against judgment in a case where the Thames and Mersey Insurance Co. claimed to have been subrogated by the owners, in respect of the sum recovered from the C.P.R. as a result of the action for damages suffered by the collision.

The Helvetia was insured for £45,000, and was chartered by the Dominion Coal Co. for seven years, from 1911 to 1917 inclusive. As a result of the collision the Helvetia was sunk, and the insurance company paid for a total loss. The responsibility for the collision was divided between the two vessels concerned, the Empress of Britain being condemned to pay five-twelfths of the loss. Under the collision clause of the policy the insurance company was called upon to pay £19,560. In the enquiry to ascertain the amount payable by the Empress

of Britain, in the first instance, the Registrar's report, when he fixed £65,000, was based on the value of the vessel at Nov. 15, 1912, which was not the date of the collision, but the end of the first season of the charter. He took the loss of charter up to the same date and assessed it at £2,000. An appeal resulting from this decision, it was decided that the value of the vessel should have been taken as at Nov., 1917, the date of the expiry of the charter, but it was subsequently agreed as between the respective owners, that the lump sum of £67,000 be fixed without dividing the amount as between vessel and charter. The five-twelfths for which the Empress of Britain was liable, and which has been paid, is approximately £26,900, and the insurance company claims to have been subrogated to the position of the owner of the Helvetia in respect of that sum, and to recover it. The defence of the owners against that claim is that as by the decree of the Admiralty Division they were entitled to recover five-twelfths of their loss, the amount to which the insurance company was subrogated is five-twelfths of £45,000. The lower court had decided in favor of the insurance company on that point, hence the recent appeal. On this main point, the court decided that the insurance company is entitled to recover from the owners all sums which they received in respect of the vessel, up to £45,000, the amount of the policy.

Order re British Vessels Trading Between Foreign Ports.

A British order in council has been issued, directing that from and after Dec. 1, 1915, no British steamship registered in the United Kingdom, exceeding 500 tons gross tonnage, shall carry any cargo from any foreign port to any other foreign port, whether or not such vessel while carrying such cargo calls at any intermediate port within the British Empire, unless the owner or charterer of such steamship has been granted exemption by license. The expression "foreign port" covers any port outside the British Empire.

A committee, appointed by the President of the British Board of Trade, has been formed to carry this order into effect, with power to grant exemption licenses in favor of owners and charterers, which may be general in reference to classes of ships or their voyages, or special.

The Sick and Distressed Seamen Fund for the financial year ended Mar. 31, 1915, showed receipts \$72,602.43, and expenditures \$65,397.85. The number of seamen treated was 3,030, and the number of hospital treatment days was 22,140. Under the provisions of the Canada Shipping Act, dues of 1½c. a ton, are levied on the registered tonnage of all vessels entering any port in Quebec, Nova Scotia, New Brunswick, Prince Edward Island and British Columbia. Vessels of 100 tons and less pay once a year, and those of over 100 tons three times a year. No dues are collected from Ontario, as the act does not apply to that province. The number of vessels paying dues was 3,148, and the number of men employed on them was 65,221.

Removal of Navigation Obstructions.—The Marine Department, during the past fiscal year, expended \$8,528.94, on the removal of obstructions and dangers to navigation in various parts of the Dominion. The chief expenditures were, \$4,900 for removing the s.s. City of London wreck near Amherstburg, Ont.; \$1,450 for removing the wreck of the Charles Crawford in Lake St. Clair, and \$1,273.81 for removing the Rhoda wreck near Lachine, Que.

January, 1916.]

Atlantic and Pacific Ocean Marine.

The British s.s. Carleton, bound from New York to Queenstown, Ireland, with sugar, put into Halifax, Dec. 6, with fire in no. 2 hold.

The White Star-Dominion Line's winter sailings are weekly from Portland, Me., to Liverpool, with the steamships Auchendale, Ardgorm, Irishman, Michigan and Norseman, and from Portland to Avonmouth with the s.s. Englishman.

The British s.s. Oakfield, which was reported to be drifting in a disabled condition about 600 miles southeast of Cape Race, Nfld., was taken into a British port, Dec. 3, in tow by the s.s. Lady Ninien, having lost her propeller blades.

The British s.s. Queen Margaret, owned by the Dunlop Steamship Co., was brought into St. John's, Nfld., Dec. 6, having suffered some damage in striking ground near Cape Race, Dec. 3, in a fog, while bound from London, Eng., to Boston, Mass.

The American International Corporation, organized in New York recently, has purchased the remaining seven steamships of the Pacific Mail Steamship Co. W. R. Grace and Co., shipping agents on the Pacific coast, are interested in the matter.

Robert Reford & Co. have chartered the United States s.s. Morris Adler for trans-Atlantic service. On sailing from Montreal early in December, she changed her name to Tip Top, and passed under the British flag, after which she proceeded to New York, to load grain for Europe.

The Norwegian s.s. Tellus, which was reported stranded at Nemuro, near Yokohama, Japan, when bound from Comox, B.C., to Vladivostok, Russia, is owned by W. Wilhelmson, Tonsberg, Norway. She was built in 1911, is 7,395 tons, and insured on a value of £70,000. She was at one time under charter to the Nova Scotia Steel and Coal Co.

The British Canadian Steamship Co., Ltd., has been incorporated under the Dominion Companies Act, with \$10,000,000 authorized capital and office at Montreal, to carry on a general steamship owning and operating business. The incorporators are all connected with Meredith, Macpherson, Hague, Holden, Shaughnessy and Heward, Solicitors, Montreal.

In answer to a question in the British House of Commons recently, the percentage of tonnage of various steamship companies which have been requisitioned for war purposes was given, the C.P.R. having 46.5%

requisitioned up to Jan. 1, 1915, and on Oct. 1, 1915, 41.3% of its total tonnage. Of these percentages, 41.3% and 30%, respectively, were requisitioned by the Indian Government.

The C.P.R. s.s. Empress of Japan has resumed her regular sailings across the Pacific Ocean. During her period of requisition by the Indian Government, she was engaged in patrol work chiefly, on the Pacific and elsewhere, and carried eight 4.7 in. guns. She was on duty at Cocos Island after the German s.s. Emden was destroyed, and also took part in some fighting at Bab-el-Mandeb, near the entrance to the Red Sea.

Canada Steamship Lines, Ltd., announces it has completed arrangements for the chartering of the Canada Atlantic and Plant Line Steamship Co.'s s.s. Evangeline, for operation during the winter, from New York to Bermuda, in conjunction with the s.s. Bermudian. It is stated that the intention is to give a service of two trips a week between the points named. The Evangeline has for some time been operated between Halifax and Boston.

William Thomson & Co., Ltd., has been incorporated under the New Brunswick Companies Act, with an authorized capital of \$25,000, and office at St. John, N.B., to acquire as a going concern the business now carried on there by William Thomson & Co., and to carry on the general business of steamship and vessel agents, tugboat owners, managers and agents, stevedores, etc. Among the incorporators are, P. W. Thomson, shipowner, and D. W. Ledingham, steamship manager, St. John.

The steamships Ocamo and Oruro, formerly operated by Pickford and Black, Ltd., between Halifax, St. John and the West Indies, have been sold to United States parties, with whom, it is reported, C. W. Morse, at one time connected with the Eastern Steamship Co., is associated. It is stated that they will be drydocked at Halifax, and then placed in service between New York and Archangel, Russia. The Ocamo was built at Glasgow, Scotland, in 1877, and is 300 ft. long, the Oruro, was also built in Glasgow, in 1878, and is 301 ft. long, with a tonnage of 1,919 gross.

The Allan Line winter passenger sailings between St. John, N.B., and Liverpool, are being undertaken by the steamships Corsican, Pretorian and Scandinavian, three sailings being made each month by each vessel, except during February, when the Pretorian will not be in service. The steamships Sicilian and Corinthian run from St. John to London, via Havre, and the s.s. Carthag-

inian will run from Portland, Me., to Glasgow, monthly, except January. Freight service is given by the steamships Pomeranian and Sardinian, between Portland and Glasgow, and vessels are being chartered for a freight service between Boston and Glasgow.

The Great Northern Steamship Co.'s s.s. Minnesota, formerly operated across the Pacific Ocean, and which, it was announced recently, was taken to England to be sold, is now stated to have been sold to a company with headquarters in London, Eng., for \$2,000,000. She was built in 1904, and was the largest passenger vessel running on the Pacific. Her dimensions were,—length 630 ft., beam 73½ ft., depth from keel to saloon deck amidships 56 ft., from keel to upper navigation bridge 88 ft. 4 ins.; displacement 37,500 tons. She has accommodation for 318 cabin, and 1,500 third class passengers, with a crew of 250.

Maritime Provinces and Newfoundland.

During the St. Lawrence navigation season of 1915, the Dominion Coal Co. shipped 1,600,000 tons of coal to Montreal, about 300,000 tons less than in 1914. The main reason for the reduction is that Government transports bunkered at Sydney this year instead of Montreal.

The s.s. Beatrice, owned by John and James Yorston, Pictou, N.S., is reported to have been sold to the Nova Scotia Steel and Coal Co., New Glasgow, N.S. She was built at Stockton-on-Tees, England, in 1889, and is screw driven by engine of 99 n.h.p. Her dimensions are,—length 208 ft., breadth 29.1 ft., depth 13.4 ft.; tonnage, 712 gross, 353 register.

The whaling steamer Nascopie, owned by Job Bros., St. John's, Nfld., is reported to have been chartered by the Russian Government for service between Archangel, Russia and Naples, Italy. The steamships Adventure and Bellaventure, negotiations for the sale of which were mentioned in our last issue, are also reported to have been acquired by the Russian Government.

The s.s. Senlac, bound from Charlottetown, P.E.I., to St. John's, Nfld., was reported from Sydney, N.S., Dec. 14, to have been destroyed by fire, together with part of her cargo. The crew and part of the cargo were saved. She was built at St. John, N.B., in 1904, and was screw driven by engine of 66 n.h.p., and her dimensions were: length 182 ft., breadth 33 ft., depth 16.1 ft.; tonnage, 1,011 gross, 615 register.

List of Steam Vessels Registered in Canada During November, 1915.

No.	Name	Port of Registry	Where and When Built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines H.P.	Owner and Managing Owner
133793	Henry F. Jelly	Port Stanley, Ont.	Port Stanley, Ont., 1915	59 0	16 5	6 2	31	21	9 sc.	N. S. Cornell, Port Stanley, Ont.
137856	J. C. Stewart	Toronto	Ferryburg, Mich., 1915	71 0	20 0	8 7	113	30	36 sc.	Canadian Stewart Co., Toronto
134020	J. W. Ward	Port Arthur	Benton Harbor, Mich., 1909	70 4	19 1	6 8	64	33	10 sc.	Port Arthur Construction Co., Port Arthur, Ont.
133952	M. & F. Hopper, Barge No. 2	Sorel, Que.	Collingwood, Ont., 1915	180 0	32 1	13 6	745	336	72 sc.	Minister of Marine, Ottawa
134553	Misford	Port Burwell, Ont.	Welland, Ont., 1915	80 0	20 0	9 5	114	40	24 sc.	A. J. Misner & E. G. Tedford, Port Burwell, Ont.
134550	Misfango	Ottawa	Low Bush, Ont., 1915	66 8	16 0	4 8	72	39	11 hp.	Abitibi Power and Paper Co., Montreal
134129	Olearylee	Liverpool, N.S.	Liverpool, N.S., 1915	77 4	17 4	6 9	76	30	16 sc.	F. W. Hatt, Liverpool, N.S.
138131	Q. H. C. Grain Boat No. 1	Quebec, Que.	South Bank on Tees, Eng., 1914	202 0	39 1	15 4	936	70	36 sc.	Quebec Harbor Commissioners, Quebec, Que.
104283	Turret Cape (a)	Toronto	Sunderland, Eng., 1895	255 0	44 0	19 4	1,827	1,142	250 sc.	Canadian Ocean & Inland Nav. Co., Toronto

(a) Recovered wreck

List of Sailing Vessels and Barges Registered in Canada During November, 1915.

No.	Name	Port of Registry	Rig	Where and When Built	Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
130390	Ed. McWilliams	Amherstburg, Ont.	Barge	Bay City, Mich., 1893	200 0	34 0	14 0	664	Miss A. Hackett, Amherstburg, Ont.
138949	G. of G. No. 2	Vancouver, B.C.	Scow	North Vancouver, B.C., 1912	86 5	28 2	6 3	123	Gulf of Georgia Towing Co., Vancouver, B.C.
137881	Lucille M. Smith	Lunenburg, N.S.	Schr.	Lunenburg, N.S., 1915	102 0	26 0	11 0	98	A. Beck, M.O., Lunenburg, N.S.
134176	Maud Thornhill	Shelburne, N.S.	Schr.	Shelburne, N.S., 1915	104 5	23 5	10 0	79	Samuel Harris, Lt. J., Grand Bank, Nfld.
137895	Tornado	Toronto	Dredge	Toronto, 1914	170 0	42 1	12 0	357	Canadian Stewart Co., Toronto
137882	Vivian P. Smith	Lunenburg, N.S.	Schr.	Lunenburg, N.S., 1915	102 0	26 0	11 0	97	W. C. Smith, M.O., Lunenburg, N.S.

Province of Quebec Marine.

The figures for the recently closed season of St. Lawrence navigation show that 41,352,876 bush. of grain passed through the Lachine Canal, against 67,343,952 in 1914. The number of vessels using the canal was 590, against 615, but their combined tonnage was 249,050, an increase in tonnage of 19,795 tons.

The s.s. Lady of Gaspé was sold at public auction at Quebec recently, to J. C. Fectau, for \$10,200. She was owned by the Gaspé Steamship Co., Quebec, and ran ashore, Oct. 13, near the site of the Quebec Bridge. She was floated and taken to Pointe a Carcy wharf, Quebec, where, owing to defects in her pumping machinery, she again sank, and was abandoned. She was refloated by the Quebec Harbor Commissioners.

Ontario and the Great Lakes.

The traffic handled at Port McNicoll, during the past season, was, freight westbound, 53,783 tons; flour eastbound, 108,624 tons; grain eastbound, 22,760,479 bush.

The underwriters extended insurance on hulls and cargoes to Dec. 12. Sailings which took place after midnight on that date were entirely at owners' risk.

Two steam tugs, C. M. Bowman and Maud L., were destroyed by fire at Owen Sound, Dec. 12. They were together at anchor, and the fire arose on board the former while the flues were being cleaned.

Canada Steamship Lines s.s. W. Grant Morden cleared from Port Arthur, Dec. 10, with a cargo of 760,000 bush. of oats for Port McNicoll, which is said to be the largest single grain cargo ever shipped from any port.

Between Sept. 1 and Dec. 11, 166,346,965 bush. of grain were shipped from Port Arthur and Fort William. This is the highest amount shipped in a similar period, the nearest approach being in 1913, when 128,000,000 were shipped.

The C.P.R. lake steamships Alberta, Assiniboia, Athabasca, Keewatin and Manitoba have been laid up for the winter at Owen Sound, where it is stated extensive repairs will be undertaken, contracts for which have been let in the locality.

Canada Steamship Lines, Ltd., which press reports credit with having arranged a contract with the United States Steel Corporation for transportation of ore, has, we are officially advised, made no such arrangements with that corporation. It will, however, carry U.S. ore from private parties.

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater, for November, as follows:—Superior, 602.89; Michigan and Huron, 579.52; Erie, 571.46; Ontario, 244.94. As compared with the average November levels for the past ten years, Superior was 0.42 ft. above; Michigan and Huron, 0.77 ft. below; Erie, \$\$.35 ft. below, and Ontario, 0.69 ft. below.

Goderich, Ont., press dispatch, Dec. 24:—The steamboat Mariska, which stranded in the centre of the channel while entering Harbor Beach in a northwesterly gale on her last trip down, completed temporary repairs here today after unloading her grain cargo, and left again for Collingwood, accompanied by the Reid Wrecking Co.'s tug, Fischer, and on arrival there will enter drydock for a thorough examination and repairs.

An examination of the entrance to Key Harbor, Lake Huron, where the s.s. W. D. Rees struck a rock recently, shows that a rock was found close to the black spar buoy no. 15, which was found to be northward of its proper location. The rock had a

least depth of 17½ ft. of water over it, at the present stage of water, or 1½ ft. less than the datum of the chart. The spar buoy has been moved to its charted position immediately south of the danger.

The lake underwriters have sold the wreck of the s.s. W. C. Moreland, which was wrecked on the Sawtooth Reef, in Lake Superior, in 1910, to R. M. Wolvin, Winnipeg, for \$55,650. The salvaging work was carried out by the Reid Wrecking Co., Sarnia, Ont., who will receive 65% of the net proceeds of the sale. We are advised that no decision has been arrived at by the present owner as to what will be done with the vessel, it having been bought as a speculation.

The Northern Navigation Co.'s s.s. Majestic was destroyed by fire, while lying at the old elevator dock at Point Edward, Dec. 15. The fire commenced in the hold and soon got beyond control. It was then decided to take the burning vessel to Sarnia Bay alongside some old wrecks, where no harm could be done, and while being towed, the lines parted and she drifted alongside the same company's s.s. Saronic, which caught fire. The loss on the Majestic is placed at \$100,000, with \$90,000 insurance, and on the Saronic at \$20,000. The s.s. Majestic was built at Collingwood in 1895, and was screw driven by engine of 123 n.h.p. Her dimensions were: Length, 209 ft.; breadth, 35 ft.; depth, 12.6 ft.; tonnage, 1,578 gross, 1,073 register. Repairs to the Saronic will be carried on at Sarnia during the winter, but the Majestic is a total loss.

British Columbia and Pacific Coast.

The Chilean ship Carelmapu was wrecked and lost off the west coast of Vancouver Island, during a storm towards the end of November, and 17 of the crew, with 1 passenger, were drowned, 4 of the crew and 1 passenger being saved.

The C.P.R. s.s. Princess Maquinna, which was repaired and overhauled at Esquimalt recently, has replaced the s.s. Princess May on the Granby route, the latter taking the place of the s.s. Princess Sophia, which will likely be laid up for the winter.

The Dominion Government grain elevator at Vancouver is expected to be completed and ready for business about the middle of January. Construction work was reported early in December to be in its final

stages. There will be capacity for 1,500,000 bush.

The Grand Trunk Pacific Coast Steamship Co.'s winter schedule, which was put into effect, Dec. 20, between Seattle, Victoria, Vancouver and Prince Rupert, is undertaken by the steamships Prince George and Prince John. The Prince Rupert has been laid up.

The s.s. Curacoa, which was wrecked at Warm Chuck, Alaska, June 21, 1913, salvaged in Aug., 1914, and after being repaired, tied up at Vancouver, pending a sale, has been sold by the Vancouver Dredging and Salvage Co., to the Pacific Coast Steamship Co., her owners before the wreck.

At a meeting of the West Vancouver Council ferry board recently, W. C. Thompson was appointed Manager, West Vancouver Ferry Co., vice T. Campbell, whose attitude and statements regarding the conduct of the business by the ferry board were considered detrimental to the interests of the service.

The Canadian Northern car ferry, which is being built at Levis, Que., will probably run between Port Mann, on the south side of the Fraser River above New Westminster, down the Fraser River and across the Strait of Georgia to Patricia Bay, Vancouver Island, instead of from Steveston, at the mouth of the Fraser River, as previously stated. Steveston is said not to be suitable for a harbor standpoint.

The School of Navigation at Queen's University, Kingston, Ont., started its third session Dec. 14 for a three months course, which is open without charge to all seamen desiring instruction in navigation and seamanship, and especially prepares for certificates as tug boat captain, minor mate, minor master, inland mate, inland master, coasting mate and coasting master. The chief instructor is Capt. H. H. McMaster, Assistant Superintendent, Montreal Transportation Co. The course includes five lectures on electrical and magnetic effects in the earth and atmosphere, including storms and weather predictions, by A. L. Clark, Ph.D., Professor of Physics, and also five lectures on practical astronomy by D. Buchanan, Ph.D., Associate Professor of Mathematics. The examinations for the different certificates will be conducted in Kingston by Capt. H. W. King, Dominion Supervisor of Marine Examinations.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during November.

ARTICLES			CANADIAN CANAL	U. S. CANAL	TOTAL
Copper.....	Eastbound	Short tons	984	32,990	33,974
Grain.....	"	Bushels	8,006,592	12,331,768	20,338,360
Building stone.....	"	Short tons	444,610	947,250	1,391,860
Flour.....	"	Barrels	790,842	3,704,125	4,494,967
Iron ore.....	"	Short tons			
Pig iron.....	"	M. ft. b.m.	4,905	30,538	35,443
Lumber.....	"	Bushels	17,257,077	57,131,610	74,388,687
Wheat.....	"	Short tons	8,052	32,864	40,916
General merchandise.....	"	Number	119	21	140
Passengers.....	"				
Coal, hard.....	Westbound	Short tons	19,500	214,208	233,708
Coal, soft.....	"	"	35,490	1,307,758	1,343,248
Flour.....	"	Barrels			
Grain.....	"	Bushels			
Manufactured iron.....	"	Short tons	2,782	16,415	19,197
Iron ore.....	"	"			
Salt.....	"	Barrels	5,006	62,914	68,920
General merchandise.....	"	Short tons	50,892	98,154	149,046
Passengers.....	"	Number	87	7	94
Summary.					
Vessel passages.....		Number	576	1,880	2,456
Registered tonnage.....		Net	1,844,470	5,721,516	7,065,986
Freight—Eastbound.....		Short tons	1,522,487	5,895,580	7,418,067
—Westbound.....		"	109,382	1,640,872	1,750,254
Total freight.....		"	1,631,879	7,536,452	9,168,331

January, 1916.]

Mainly About Marine People.

Phillip Dorman, formerly Lloyd's Agent at Buenos Ayres, Brazil, died at Toronto, Dec. 14, age 73.

Capt. A. V. Tremaine, who has been seriously wounded in action in Europe, is a son of A. DeB. Tremaine, Superintendent of Agencies, Marine Department, Ottawa.

J. L. Nelson, Superintendent of dredging for British Columbia, under the Dominion Public Works Department, since March, 1913, was reported, Dec. 10, to have resigned.

F. W. Lewis, of Furness Withy and Co., has been appointed one of the members of the Ship Licensing Committee, appointed by the British Government to license vessels to engage in trading between foreign neutral ports.

Capt. J. H. Brown, of the Donaldson Line s.s. *Marina*, was presented recently with a gold watch and chain, on behalf of the President of the United States, for rescuing the shipwrecked crew of the U.S. schooner *Fulmer Palmer* in the Bay of Fundy.

J. S. Byrom, Superintendent, Great Lakes Steamship Service, C.P.R., was entertained to dinner by the Owen Sound Board of Trade, on the occasion of the wintering of the company's vessels at Owen Sound for overhaul and repairs, after an absence of four years.

Capt. A. A. Johnson, of Toronto, formerly chief officer of the Toronto Ferry Co., and latterly first officer on the British s.s. *Calgary*, was killed on board his vessel, Dec. 15, during a stormy voyage from Bathurst, N.B., to New York, when a deck load of lumber went overboard.

Capt. W. McGregor, formerly commanding one of the G.T.R. car ferries operating between Windsor and Detroit, has had his left leg amputated, owing to having been run over by a switching locomotive in the Windsor yards, Dec. 6. He is over 70 years old, and was connected with the car ferries for about 40 years.

Capt. H. W. LaRush was buried at Mount Pleasant cemetery, Toronto, Dec. 6, when W. E. Burke, Assistant General Manager, and the entire local staff of Canada Steamship Lines, Ltd., attended. Capt. LaRush was in charge of the company's tug *Frank C. Barnes*, which left Port Dalhousie, Nov. 1, and foundered with her crew of six during a storm during the first few days of November. Only two bodies, one of which is unidentified, have been recovered.

J. T. Walsh, heretofore Marine Department, C.P.R., Montreal, who has been appointed Assistant Manager, Canadian Pacific Ocean Services, Montreal, is said in a press dispatch to have had service under the Elder-Dempster Co. in West Africa, where, in addition to his other duties, he raised and commanded a volunteer force during the native revolt of 1898, receiving the West African medal. He was a member of the Legislative Council there in 1900, and was mentioned in dispatches by Col. Willcocks for embarkation services during the Ashantee war.

Capt. W. Murchison, one of the oldest lake captains running out of Toronto, died there, Nov. 26, aged 65. His first marine experience was as a deck hand on the *Rossie Castle*, sailing between Toronto and Hamilton, about 1875. He was at a later date captain of the vessels *Steinhoff* and *Victoria*, sailing between Toronto and Victoria Harbor. He subsequently purchased the sidewheel steamboat *Niagara*, and was later in the service of the Doty Ferry Co., which was taken over by the Toronto Ferry Co. and acted as master of the ferry *Island Queen*. He retired from active service a few years ago, and engaged in fruit farming.

Charles Tupper Knowlton, whose appointment as Superintendent of Ferries, Canadian Government Railways, Moncton, N.B., was announced in our last issue, was born at Advocate Harbor, N.S., Aug. 26, 1849, and commenced a seafaring life in July, 1868, since when he has to 1887, occupied all positions from sailor to captain in square rigged vessels sailing between various United States and Canadian ports to South America, West Indies, Great Britain and the European continent, and from 1887 to the date of his present appointment, he has commanded six different cruisers of the Fisheries Protection Service, at various points on the Atlantic coast.

Batiscan-Bengore Head Collision.—The actions between the owners of these two vessels for damages sustained in a collision in the St. Lawrence, Aug. 1, were heard by the Admiralty Court, in Montreal, Dec. 7, when it was held that the s.s. *Batiscan* was to blame for the collision, as the captain had disobeyed the international rules of the road, whereas the captain of the s.s. *Bengore Head* was shown to have complied with the rule. It was ordered that the damage to the *Bengore Head* be assessed by the Registrar, and the action by the *Batiscan* was dismissed with costs. The *Ulster Steamship Co.*, owning the s.s. *Bengore Head*, sued the *Sydney, Cape Breton and Montreal Steamship Co.*, owning the s.s. *Batiscan*, for \$150,000, and there was a counter action for \$50,000. In connection with this casualty, strong representations are being made to the British Government, which has the power to revise the sentence on the captain of the s.s. *Batiscan*, to have the case reconsidered. The Dominion Wreck Commissioner, in placing the blame on the captain and the pilot, suspended the former's certificate for two years, allowing a mate's certificate to be granted at the end of the first 12 months, and fined the pilot \$300.

The Loss of the Tug *Edward Long* at Ottawa.—A formal enquiry into the sinking of the steam tug *Edward Long*, while moored at the Rideau Canal locks at Ottawa, Nov. 12, was held at Montreal, recently, at the request of the owner, Capt. Long, who claimed that the loss was caused by the Public Works Department's tug *Blanche*. Capt. L. A. Demers, Dominion Wreck Commissioner, in giving judgment, found that the *Blanche* came into contact with the *Edward Long* and forced her against the corner of the pontoon, causing a parting of the seams, resulting in an inlet of water, which led to the eventual sinking of the vessel. He states that had there been some one on the *Edward Long*, who could have examined the damage, the vessel might have been beached and saved, but no attempt seems to have been made, either to save, or salvage the tug, and therefore finds that the *Blanche* was primarily the cause of the damage, and that Capt. Long, of the tug *Edward Long*, is equally to blame. As the master of the *Blanche* holds no certificate, he cannot be dealt with by the court. The decision was concurred in by Capt. F. Nash and C. Lapierre, nautical assessors.

Montreal Harbor Traffic.—At a dinner to the Massachusetts Terminal Commission at Montreal, Dec. 9, W. G. Ross, Chairman, Montreal Harbor Commissioners, stated that while in 1907 the port's business amounted to 1,000 cars a week, more than that number are now handled daily. The tonnage has increased since 1908 by 110%, compared with Boston's increase of 16%, while in 1914, Montreal's exports and imports exceeded those of Boston, which once held the lead, by \$13,000,000. During 1914, Montreal shipped five times as much grain as Boston.

Lake Freight Steamships Sold for Ocean Service.

The lake freight steamships, *G. R. Crowe*, owned by the St. Lawrence and Chicago Steam Navigation Co., Toronto, the *Algonquin*, owned by the Port Colborne and St. Lawrence Navigation Co., a subsidiary of the Maple Leaf Milling Co., Toronto, and the *Seguin*, owned by the Parry Sound Transportation Co., Toronto, have been sold to A. B. Mackay, Hamilton, Ont. It is stated that the former vessel will be converted into an oil tank vessel for service to the Gulf of Mexico, and that the latter vessel will be overhauled and prepared for trans-Atlantic operation.

The s.s. *G. R. Crowe* was built at Dundee, Scotland, in 1907, and lengthened 72 ft. at Collingwood, Ont., in 1910. She is of steel, with steel tank top, three watertight and two non-watertight bulkheads, steel boiler house, and is equipped with triple expansion engines with cylinders 18, 29½, and 48 ins. diam., by 36 ins. stroke, 1,079 i.h.p. at 81 r.p.m., and supplied with steam by two Scotch boilers 13¼ by 10½ ft. at 180 lbs. pressure. Her dimensions are: length 324 ft., breadth 43¼ ft., depth 26 ft.; tonnage, 2,939 gross, 2,346 register.

The s.s. *Algonquin* was built at Glasgow, Scotland, in 1888, for the Canadian North West Steamship Co., Port Arthur, Ont., Thomas Marks & Son, Managing Owners, and was purchased some years later by the St. Lawrence and Chicago Steam Navigation Co., and in 1912 was sold to the Port Colborne and St. Lawrence Navigation Co. She is of steel and is equipped with triple expansion engines with cylinders 21, 33, and 54 ins. diam., by 36 ins. stroke, 1,000 i.h.p. at 70 r.p.m., and supplied with steam by two Scotch boilers under forced draught, 13 by 9 ft., at 160 lbs. pressure. Her dimensions are: length 245 ft., breadth 40 ft. 1 in.; depth 20½ ft.; tonnage, 1,806 gross, 1,172 register.

The s.s. *Seguin* was built at Owen Sound, Ont., by Polson Iron Works, Ltd., Toronto, in 1890, and is of steel, with well deck, two watertight bulkheads, wooden sheathing on steel bottom, with hatches at 24 ft. centres. She is equipped with triple expansion engines with cylinders 17, 28, and 46 ins. diam., by 30 ins. stroke, 550 i.h.p. at 86 r.p.m., supplied with steam by two Scotch boilers 10¼ by 10 ft. at 160 lbs. pressure. Her dimensions are: length 207 ft., breadth 34 ft. 2 ins., depth 13 ft.; tonnage, 1,141 gross, 771 register.

A contract is reported to have been awarded for the alterations to the s.s. *G. R. Crowe*, which it is stated will be carried out at Midland, Ont. As the vessel is too long to pass through the Welland Canal, the alterations required are considerable.

The Dominion Government and Wheat in Elevators.—The action of the Dominion Government in commandeering all the nos. 1, 2 and 3 northern wheat in store at elevators at Port Arthur and Fort William, Ont., and points east, at the end of November, caused a little uneasiness among vessel owners on the Great Lakes, as the unexpected action toward the close of the season would, it was feared, cause an earlier closing of navigation than was otherwise anticipated. Arrangements were subsequently made with the Government whereby certain of the commandeered grain was released in order that contracts might be fulfilled, and any possible inconveniences which might arise were eliminated.

The Panama Canal, through which traffic has been suspended for some time owing to land slides, was reopened, Dec. 19, for vessels of 20 ft. draught, the obstructions in the Gaillard cut having been removed.

Dominion Government Icebreaking Steamship for the St. Lawrence.

We are officially advised that the icebreaking steamship for St. Lawrence River service will probably be launched at Montreal about the reopening of navigation, and that it is expected to have it ready for service about the end of September. An extension of time for the construction of this vessel, the contract for which was awarded to Canadian Vickers, Ltd., Montreal, prior to the war, has been granted by the Dominion Government. The contractors some time ago advised the Dominion Government that their yards had been requisitioned by the British Government, thus necessitating the suspension of the work, which was well in hand. It is announced that they have shown to the Government's satisfaction, that, at the time of the application for the extension, they were unable to proceed with the building. This vessel will be built under Lloyd's special survey, and in accordance with the Dominion Steamboat Inspection Act, to class 100 A1 at Lloyd's. The hull will be divided by transverse and longitudinal watertight bulkheads, and the propelling machinery will consist of two sets of triple expansion surface condensing engines with working parts 60 to 35% in excess of Lloyd's requirements, supplied with steam by two double ended, and four single ended Scotch boilers, at 180 lbs. pressure. Her dimensions will be,—length over all 292 ft., length between perpendiculars 275 ft., extreme breadth 57½ ft., depth 32 ft., draught 19 ft. A full description of her was given in Canadian Railway and Marine World for June, 1915.

Hamburg-American Line Officials Convicted.—The trial of a number of officials of the Hamburg-American Line concluded at New York, Dec. 3, when Karl Buenz, Managing Director; G. Katter, General Superintendent; A. Hachmeister, General Purchasing Agent, and J. Poppinghaus, a former Germany navy officer, were found guilty on each of two indictments for conspiracy to deceive and defraud the United States Government. The evidence showed that the law had been violated by those charged, in sending coal and other supplies to German cruisers in the South Atlantic in the early stages of the war. Sentence was deferred pending the hearing of a motion to set aside the verdict and arrest judgment, and in the meantime, each of the prisoners is out on bail of \$5,000. The maximum penalty on each indictment is two years imprisonment and \$10,000 fine.

Plot to Destroy the Welland Canal.—The United States Government is proceeding against a number of German subjects and United States citizens of German birth or origin for conspiring to commit an act of war, with the United States as a base, against a friendly country, the Dominion of Canada. It is stated that the parties have been under observation for some time, and that it was intended to blow up certain locks on the Welland Canal, to prevent shipments of grain passing through from the Great Lakes. Paul Koenig, Chief of Police, Hamburg-American Steamship Co., New York, who is spoken of as being very intimate with the German Ambassador and other German officials at Washington, D.C., appears to have been the chief organizer of the conspiracy.

Close of St. Lawrence Navigation Season.—The s.s. Port Dalhousie, owned by Forwards Limited, Kingston, Ont., in sailing from Montreal, Dec. 8, created a record for the closing of the St. Lawrence season. She was bound for England, calling at Pictou, N.S.

Results of Canada Steamship Lines, Limited, for 1915.

Montreal press dispatch, Dec. 14:—"At the monthly meeting of directors of Canada Steamship Lines, Ltd., today, J. W. Norcross, Managing Director, stated that business during the past three months had been very satisfactory, and he had great confidence in the outcome of the entire season's business. While he would not commit himself as to the amount of net earnings, he gave the impression that some of the optimistic prophecies made recently on the "street" were not far short of the mark. He expressed himself as being pleased with the outlook for winter business of the ocean vessels, stating that the Bermuda passenger trade had been in excess of the corresponding period last year, and to cope with the increased tonnage offering the company had chartered another passenger steamship, the Evangeline, to be used solely on that route. The West Indies freight tonnage was also heavier than could be handled by the company's ocean fleet, and it had been necessary to send one of the lake steamships, the Canadian, to the Atlantic coast to help carry the tonnage. Freight, both north and south bound, was congested. Mr. Norcross would not confirm rumors that very large economies in operation had been effected but admitted that expenses had been reduced considerably."

Prize Court Cases at Halifax.—A sitting of the Prize Court was held at Halifax, N.S., Dec. 1, to deal with the steamships Hamborn and Hocking, seized recently as lawful prizes. It is claimed that though operating under the United States flag, they are owned by the enemy. Notice of requisition under an order of the Prize Court, has been served, pending final condemnation. On Dec. 6, on the application by cable of the British Secretary of State for the Colonies, the case was transferred to England to be dealt with. In the case of the s.s. Hamborn, an appeal to the Imperial Privy Council has been allowed.

Dredging Disputes in British Columbia.—Press reports state that a number of contractors' accounts have been held up, on account of over classification in dredging. The amounts involved are stated to reach \$150,000. Complaints are also made regarding alleged padding of accounts for dredging in Victoria harbor. These matters came out in the course of a case in court at Victoria recently to determine the ownership of certain documents. The documents were ordered impounded for three months, pending further investigation.

Toronto Harbor Contracts.—The Minister of Public Works is reported to have announced, Dec. 9, that all matters in dispute in connection with defective work on certain subcontracts of the Toronto Harbor improvement works had been settled, and that the Canadian Stewart Co., the general contractors, had undertaken to make good the defective construction, without cost to the Government and to proceed with all possible speed.

The British Government and the Mercantile Marine.—In the British House of Commons, Dec. 23, the First Lord of the Admiralty announced that the Government was considering the advisability of taking over the mercantile marine service. The demand for vessels is far outrunning the supply, and this is contributing to the rising prices of the necessities of life.

Government Aid to Shipbuilding in British Columbia is occupying the attention of the recently reorganized provincial government, according to the new Premier.

Shipbuilding Conditions and Prospects in Canada.

The Toronto Globe having published an article representing the outlook for shipbuilding in Canada as being very poor, the Collingwood Shipbuilding Co., Collingwood, Ont., wrote that paper recently as follows:—"United States papers have for some weeks past been dealing largely with the new orders booked by U.S. shipbuilders on the Great Lakes and coast shipyards. Canadians, therefore, interested in the shipbuilding business would naturally, on reading your article, assume that there was very little work for them in their own trades in this country and make their way across the border. Dealing with our own business, we were never busier, and we have been using your columns to let our wants for skilled and unskilled mechanics be made known. We have also advertised in perhaps some 20 or 30 local newspapers for help of all kinds. We are building three oil tank steamers for the Imperial Oil Company, and a 550 ft. bulk freighter for the Montreal Transportation Co., and recently had to refuse an order for a large steamship, not being able to make quick enough delivery. In addition, we have had inquiries for tonnage from Great Britain, United States, and Australia, which will surely indicate to you that the demand for ships is very great indeed. Apart from new tonnage, we are now assured of a full supply of winter repairs. From the above you will see that the information given in your article is not applicable to Canadian shipbuilding in general, and we believe that you should give equal publicity to the other side of the story in order to rectify the harm you may possibly have done in discouraging shipyard help from remaining in Canada."

New Brunswick-Prince Edward Island Winter Steamship Service.—On Dec. 22 we were officially advised as follows: "The Charlottetown Steam Navigation Co.'s vessels are still running between Point du Chene and Summerside and between Pictou and Charlottetown. When weather conditions necessitate their withdrawal the Marine Department will place the s.s. Stanley in service between Cape Tormentine and Summerside, and the new car ferry steamship Prince Edward Island between Pictou and Charlottetown. The Stanley will remain on the Cape Tormentine-Summerside service as long as the Prince Edward Island can make one round trip each day between Pictou and Charlottetown, or until ice conditions prevent landing either at Cape Tormentine or Summerside. When ice conditions get such that the Prince Edward Island cannot make one round trip a day between Pictou and Charlottetown, the Stanley will be put on and the two boats will run alternate days. When ice conditions in Charlottetown harbor prevent landing at Charlottetown the Prince Edward Island and the Stanley will run between Pictou and Georgetown."

Settlement of Claims in the Titanic Loss.—It was announced in New York, Dec. 20, that the claims against the Oceanic Steam Navigation Co., in respect of the loss of the s.s. Titanic, were to be settled on a basis of \$664,000, which is to be divided pro rata amongst claimants.

A press report states that the British Government has requisitioned all the refrigerating space in British steamships registered in the United Kingdom, for the transportation of frozen meat.

Twenty seven car loads of halibut were forwarded from Prince Rupert, B.C., by Canadian Express during one month recently.

January, 1916.]

Among the Express Companies.

C. Potter has been appointed agent, Dominion Ex. Co., Cranbrook, B.C., vice J. E. Dicks, transferred.

The Dominion Ex. Co. has opened offices at Brechin, Ont.; Howell, Carseland, Ensign, Jenner, Pearce and Tudor, Alta.

The Canadian Ex. Co. has opened offices at Algar and Deloraine, Man., Palmer and Yorkton, Sask., and Rumsey, Alta.

W. J. McGuire has been appointed agent, Dominion Ex. Co., Farnham, Que., vice J. O'Hara, who has enlisted for active service in Europe.

J. E. Dicks, heretofore agent, Dominion Ex. Co., Cranbrook, B.C., has been appointed agent at Lethbridge, Alta., vice G. A. Taylor, transferred.

Z. M. Middleton, heretofore chief clerk to Superintendent, Canadian Northern Ex. Co., Winnipeg, has been appointed agent at the company's newly established office at Vancouver, B.C.

The Board of Railway Commissioners has approved the Central Canada Ex. Co.'s by-law providing that Peter McArthur, General Superintendent, Edmonton, Alta., shall issue tariffs of tolls to be charged by the company.

The Canadian Northern Ex. Co. has extended its service to Vancouver, B.C., and has opened offices at Evansburgh, Onoway and Tollerton, Alta., Blue River, Boston Bar, Chilliwick, Hope, Kamloops, Lucerne, Port Mann and Vancouver, B.C.

The Canadian Ex. Co.'s operating statistics for July, 1915, compared with those for July, 1914, are as follows:

	1915.	1914.
Mileage of lines covered	10,264	9,676
Charges for transportation	\$307,574	\$318,758
Express privileges, Dr.	157,121	163,167
Operations other than transportation	5,262	5,142
Net operating revenue	18,805	17,982
Express taxes	1,200	1,000
Operating income	11,605	13,982

Telegraph, Telephone and Cable Matters.

The Board of Railway Commissioners has extended to July 1, 1916, the time for the approval of tolls to be charged by telegraph companies in Canada.

E. Trower, chief accountant, Great North Western Telegraph Co., Toronto, who resigned recently, to enlist for overseas service, was presented with a wrist watch by the staff, Dec. 2.

The Militia Department is asking for the enlistment of telegraphers for overseas duty with divisional signalling companies. After enlistment the men will be given a brief training and sent forward as soon as competent. The different code in use in Europe makes some training necessary.

The Western Union Telegraph Co. has announced that from Jan. 1 all employees will receive annual holidays with pay, on the stipulation that they shall be used for rest and recreation, and not for other employment. It is stated that the cost to the company will be about \$2,000,000.

A press report from St. John's, Nfld., Dec. 2, stated that four of the trans-Atlantic cables to Europe were broken, and that three cable ships have been engaged on repairs for some time, without success, on account of heavy storms, and that it is possible that the work will have to be abandoned until the spring.

The Bell Telephone Co. has been authorized by the Board of Railway Commissioners, in cases of telephone installations for clergymen and religious institutions, where telephone is listed in the name of an institu-

tion, or in such other manner as to indicate it is desired for other than domestic purposes, to charge business rate. Where it is listed in the name of an individual, to charge residence rate, except where it appears that the telephone is used, or is to be used, for business purposes and direct financial gain of person or institution using the instrument, in which event business rate may be charged.

The Board of Railway Commissioners has authorized independent telephone companies to appeal to the Supreme Court of Canada, on the questions as to whether the Board has power to authorize toll or charge outside established rates applicable to Bell Telephone Co. as compensation for use of long distance lines; to give compensation in respect of loss to Bell Telephone Co.'s local exchange business; and to authorize payment of special toll as condition precedent to companies competing with Bell Telephone Co., obtaining long distance connection with Bell Telephone Co., while not subjecting non-competing companies to like toll in view of provisions of the act relating to discriminations.

R. B. McMicking, who died at Victoria, B.C., Nov. 27, aged 73, was, in his early days, a telegraph operator, Montreal Telegraph Co., at Queenston, Ont., and was transferred to the Pacific coast in 1862. In 1863 he was engaged by the Collins Overland Service, which had the object of opening telegraph communication with Europe by way of Behring Strait and then over land. This project was abandoned in 1866. Between that year and 1870 he served at Yale, B.C., and was then transferred to the Western Union Telegraph Co.'s office at Victoria, B.C., in conjunction with Barnard's Express. In 1871 he was appointed Superintendent, Dominion Government Telegraphs, at Yale, in charge of the cables between the mainland and Vancouver Island. From 1875 to 1880 he was in charge of Dominion Government Telegraphs at Victoria, B.C., and since 1870 was connected with telephone service on Vancouver Island, latterly with the British Columbia Telephone Co.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Galena-Signal Oil Co.—Robt. McVicar, who has been connected with the company a great many years, and has represented it at St. Paul, Minn., has been given charge of the company's Canadian office, 603 Shaughnessy Building, Montreal, succeeding J. C. Tipton who has been transferred to St. Paul.

Standard Underground Cable Co. of Canada.—William Andrew Conner, of Plainfield, N.J., died suddenly, Dec. 6, at his office in Perth Amboy, N.J. He was born in Baltimore, Sept. 12, 1859. He began his business career in 1876, in Pittsburgh, in the oil refining business, in which he reached the position of Assistant Manager for the Standard Oil Co. In 1885 he took charge of the first plant built by the Standard Underground Cable Co. in Pittsburgh, and from then to the time of his death he was the head of the manufacturing business of that company, including large plants planned and built by him in Pittsburgh, Pa.; Perth Amboy, N.J.; Oakland, Cal., and Hamilton,

Ont. He was a director for 10 years and first Vice President since 1909. He was Vice President of the Perth Amboy Trust Co., in the inception of which he had an active part. He was a cousin of Orville T. Waring, of the Standard Oil Co.; E. J. Waring, of the Standard Underground Cable Co., and of the late Richard S. Waring, founder of the Standard Underground Cable Co., and the inventor of the Waring cables. He was also a Vice President and director of the Standard Underground Cable Co. of Canada, Ltd., whose factories were planned and built by him in Hamilton, Ont., in 1911-12. He was a 32° Scottish Rite Mason, and a Knight Templar; a member of the Duquesne Club of Pittsburgh; the Hamilton Club, Hamilton, Ont., and the Plainfield Country Club. He moved from Pittsburgh to Plainfield in 1904, since when he resided at the latter place. He leaves his widow, who was Miss Tupper, of Michigan; a brother, Edward Conner, of Orange, N.J., and a sister, Mrs. Roak, of Brooklyn, N.Y. Funeral services were held at his late residence, 999 Hillside Ave., Plainfield, N.J., by his pastor, Rev. Dr. Phillip B. Strong, of the First Baptist Church of Plainfield, and by his former Pittsburgh pastor, Rev. Dr. Lemuel C. Barnes, of New York, now Secretary of the Board of Home Missions of the Baptist Church. This service was attended by the officers and many of the leading employes of the Standard Underground Cable Co., and by numerous business acquaintances, thus testifying to the love and esteem in which he was held by all who knew him, for his sterling qualities as a man and friend.

Transportation Conventions in 1916.

Jan. 18-20, 1916.—American Wood Preservers' Association, Chicago, Ill.
 March 21-23, 1916.—American Railway Engineering Association, Atlantic City, N.J.
 May, 1916.—International Railway Fuel Association, Chicago, Ill.
 May 2-5, 1916.—Air Brake Association, Atlanta, Ga.
 May 19, 1916.—Association of Railway Claim Agents, Atlantic City, N.J.
 June 20-22, 1916.—Association of Railway Telegraph Superintendents, St. Paul, Minn.
 June 20-23, 1916.—American Association of Freight Agents, Cincinnati, Ohio.
 June 21, 1916.—Train Despatchers' Association of America, Toronto.
 June 21, 1916.—American Association of General Baggage Agents, Boston, Mass.
 June 28, 1916.—Association of American Railway Accounting Officers, Detroit, Mich.
 August, 1916.—International Railroad Blacksmiths' Association, Chicago, Ill.
 September, 1916.—Master Car and Locomotive Painters' Association of United States and Canada, Wilmington, Del.
 September, 1916.—Railway Signal Association, Mackinac Island, Mich.
 Sept. 19-22, 1916.—Roadmasters and Maintenance of Way Association, Chicago, Ill.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated:
 Canadian Car Service Bureau—J. Reilly, Manager, 401 St. Nicholas Building, Montreal.
 Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.
 Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.
 Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.
 Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July, and August.
 Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.
 Canadian Ticket Agents' Association—E. de la Hooke, London, Ont.
 Dominion Marine Association—F. King, Counsel, Kingston, Ont.
 Eastern Canadian Passenger Association—G. H. Webster, 51 Beaver Hall Hill, Montreal.
 Engineers' Club of Montreal—R. W. H. Smith, Beaver Hall Square, Montreal.
 Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.
 Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.

Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.
 Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.
 International Water Lines Passenger Association—M. R. Nelson, New York.
 Niagara Frontier Summer Rate Committee—James Morrison, Montreal.
 Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.
 Quebec Transportation Club—A. F. Dion, Quebec.
 Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.
 Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.
 Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.
 Western Canada Railway Club—Louis Kon, Box 1707, Winnipeg. Meetings at Winnipeg, 2nd Monday each month, except June, July, and

THE TORONTO, NIAGARA AND WESTERN RAILWAY COMPANY.

Notice is hereby given that The Toronto, Niagara and Western Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time wherein the company may construct the lines of railway authorized by section 2 of chapter 112 of the Statutes of Canada for 1914.

GERARD RUEL,
Chief Solicitor.

Toronto, 10th December, 1915.

CANADIAN NORTHERN RAILWAY COMPANY.

Notice is hereby given that the Canadian Northern Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time wherein the company may construct the line of railway authorized by paragraph (a) of section 8

of chapter 56 of the Statutes of Canada for 1911, shortly described as follows:—

From a point on the Oak Point Branch of the C.N.R. at or near Grosse Isle, northerly and westerly to Grand Rapids, with a branch to a point on Sturgeon Bay.

GERARD RUEL,
Chief Solicitor.

Toronto, 10th December, 1915.

CANADIAN NORTHERN ONTARIO RAILWAY COMPANY.

Notice is hereby given that the Canadian Northern Ontario Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time wherein the company may construct:—

(a) The line of railway authorized by the Statutes of Canada for 1911, chapter 57, section 2, paragraph (a), item (v), shortly described as follows:—

From a point east of Toronto via Hamilton and London to Windsor, with a branch to St. Thomas and Sarnia.

(b) Also the line of railway authorized by the Statutes of Canada for 1914, chapter 79, section 2, subsection 1, paragraph (a), shortly described as follows:—

From a point on the Port Arthur-Sudbury line near the head of Long Lake, north-westerly to a junction with the National Transcontinental Railway east of Lake Nipigon.

GERARD RUEL,
Chief Solicitor.

Toronto, 10th December, 1915.

THE TORONTO, HAMILTON AND BUFFALO RAILWAY COMPANY.

NOTICE IS HEREBY GIVEN that The Toronto, Hamilton and Buffalo Railway Company will apply to the Parliament of Canada at its next session for an Act permitting the Company to make with the Canada Southern Railway Company, the Michigan Central Railroad Company, the New York Central Railroad Company and the Canadian Pacific Railway Company, or with any of such Companies, any of the arrangements authorized to be made between Railway Companies by section 364 of The Railway Act, for a term of fifty years, and for other purposes.

Dated at Hamilton this 6th day of December A.D. 1915.

E. D. CAHILL,
Solicitor for the Applicants.

NIAGARA, ST. CATHARINES AND TORONTO RAILWAY COMPANY.

Notice is hereby given that the Niagara, St. Catharines and Toronto Railway Company will apply to the Parliament of Canada at its next session, for an Act extending the time wherein the company may construct the lines of railway authorized by section 2, chapter 159 of the Statutes of Canada for 1913.

GERARD RUEL,
Chief Solicitor.

Toronto, 10th December, 1915.

FOR TICKET CASES AND COMMERCIAL FURNITURE

of all descriptions to stock
or special design, apply to

The Canadian Office and School Furniture Co., Limited
Preston : Ontario

NICKEL SHOT—HIGH AND LOW CARBON INGOTS—TWO SIZES, 25-LB., 50-LB.

Electrolytic Nickel—99.80%

Prime Metals for the manufacture of Nickel Steel, German Silver, Anodes, and all remelting purposes. Our Nickel is produced as rods, sheets, strip stock, wire, and tubes.

MONEL METAL We are Sole Producers of this natural stronger than steel, non-corrodible alloy. Manufactured forms are rods, flats, castings, tubes, sheets, strip stock and wire. Ask for descriptive booklet.

Send inquiries direct to us.

THE INTERNATIONAL NICKEL COMPANY, - 43 Exchange Place, New York

Sessions-Standard Friction Draft Gear

Simplest and Best

Both
Made by

Standard Coupler Co.

30 CHURCH STREET, NEW YORK

Standard Steel Platforms

Used by all Canadian Railways

THE CANADIAN BRIDGE CO., Limited

WALKERVILLE, ONTARIO

LOCOMOTIVE
TURNTABLES

ROOFS

STEEL BUILDINGS

Manufacturers of

Railway and Highway

BRIDGES

STRUCTURAL
IRON WORK
OF ALL
DESCRIPTIONS

J. S. COFFIN
President

SAMUEL G. ALLEN
1st Vice-President

W. H. COYLE
2nd Vice-President

C. L. WINEY
Sec'y. and Treas.

FRANKLIN RAILWAY SUPPLY COMPANY

Specialists—In Devices That Make for Economy

MAIN OFFICE, 30 CHURCH ST., NEW YORK

CHICAGO OFFICE: 332 South Michigan Avenue.

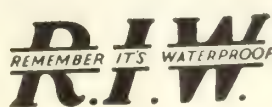
MONTREAL OFFICE:
625 Transportation Building.

SAN FRANCISCO OFFICE: 795 Monadnock Bldg.,

Important Notice to Engineers, Architects, and Contractors in the Dominion of Canada:

Dating January 1st, 1916, the well known Toch Brothers' **R.I.W.** Products, which have been made heretofore at Oakville, Ontario, will be manufactured in connection with the International Varnish Company's factory in Toronto.

The increased facilities will enable us to put out a more extensive line of our specialties throughout the Dominion, and increased distributing facilities will be arranged for.



DAMP RESISTING PAINT CO.
TOCH BROTHERS
OAKVILLE, ONT., CANADA

INTERNATIONAL VARNISH CO.
TORONTO, ONT., CANADA

ENAMELED IRON SIGNS

The ideal signs for
Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.

We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc.

Guaranteed not to
fade or be affected
by the weather in
any way.

Acton Burrows
Limited

Enameled Iron Signs

70 Bond Street - Toronto

Hunt-Spiller Gun Iron

IN

LOCOMOTIVE CASTINGS

SAVES MONEY,

INCREASES: Engine Efficiency—Engine Mileage.

DECREASES: Engine Failures—Engine Repairs.

Made Only by

Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.

J. G. Platt,
Sales Manager.

Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.

BRAKE SHOE SCRAP REDUCED TO THE ABSOLUTE MINIMUM



The Steel Back Brake Shoes here pictured were all worn down practically to the steel back.

The average weight of 100 shoes taken at random from this pile was about 5½ lbs.

The roads using these shoes received about twice as much brake shoe service as could have been gotten from ordinary unreinforced shoes. It paid them and it will pay your road to use Steel Back Brake Shoes.

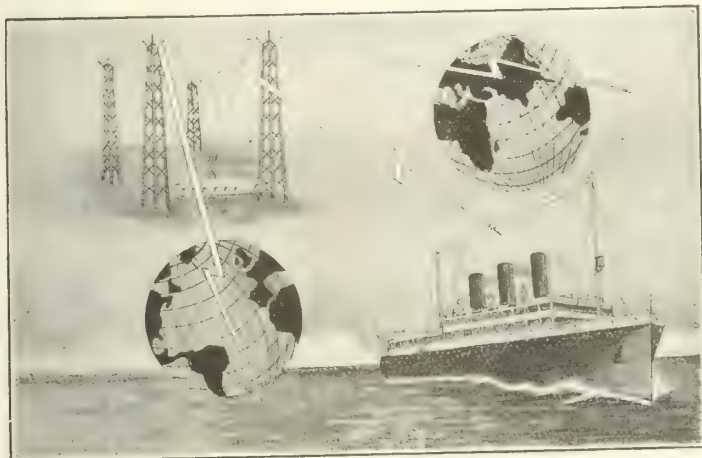
Manufactured in Canada.

AMERICAN BRAKE SHOE & FOUNDRY CO.

The HOLDEN CO., Ltd., Agents, 354 St. James St., Montreal.

Awarded Gold Medal Panama-Pacific Exposition.

CONSULT "MARCONI"



THE WORLD-WIDE WIRELESS.

MARCONI WIRELESS

A Wireless Equipment on your vessel is a safeguard against **LOSS OF LIFE, PROPERTY** and **TIME**.

THE CHEAPEST FORM OF MARINE INSURANCE

We maintain an expert organization of engineers and operators who are at your service.

Consult us on all matters pertaining to wireless.

Canadian Marconi Company

137 McGill Street, MONTREAL

Hotel Dennis

ATLANTIC CITY, N. J.

An American Plan Hotel that for the past fifteen years has been under the same management and developed on lines that appeal to people of refined taste.

It has a superior location. It is thoroughly modern. It is a recognized standard of excellence.

Capacity 600.

WALTER J. BUZBY.

IMPERIAL BANK

Capital Authorized \$10,000,000
Capital Paid-up 7,000,000
Reserve Fund 7,000,000

Head Office: Toronto.

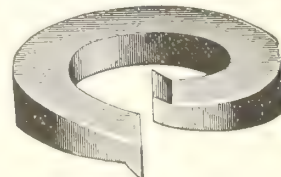
Letters of Credit, Travellers' Cheques and Drafts Issued, available in all parts of the world.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates. Branches throughout the Dominion of Canada.

The Positive Lock Washer

Is the BEST Nut LOCK for all purposes

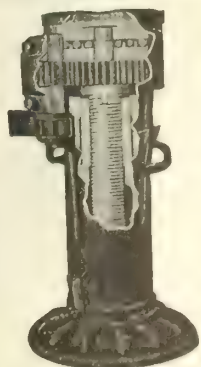


We also make plain coils and tail nut locks

The Positive Lock Washer Co.

Sole Mfrs., Newark, N.J.

F. H. HOPKINS & CO., Agents, Montreal



Showing the construction of our geared jacks

Celebrated "H & E" Lifting Jack

Our Patent Ball-Bearing Geared Jacks are Ideal in Railroad and heavy Construction Work.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

SHERBROOKE, QUE.

Sole Agents for Brakeshoes for Canada outside of B.C., Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for B.C., The B.C. Equipment Co., Vancouver, B.C. Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.

High Grade Electric STEEL CASTINGS MANGANESE STEEL

For Crusher Jaws and Heavy Wear Parts

BRONZE

M.C.B. Standard Journal Bearings and Engine Bearings

Improved Reinforced Steel-Backed BRAKESHOES

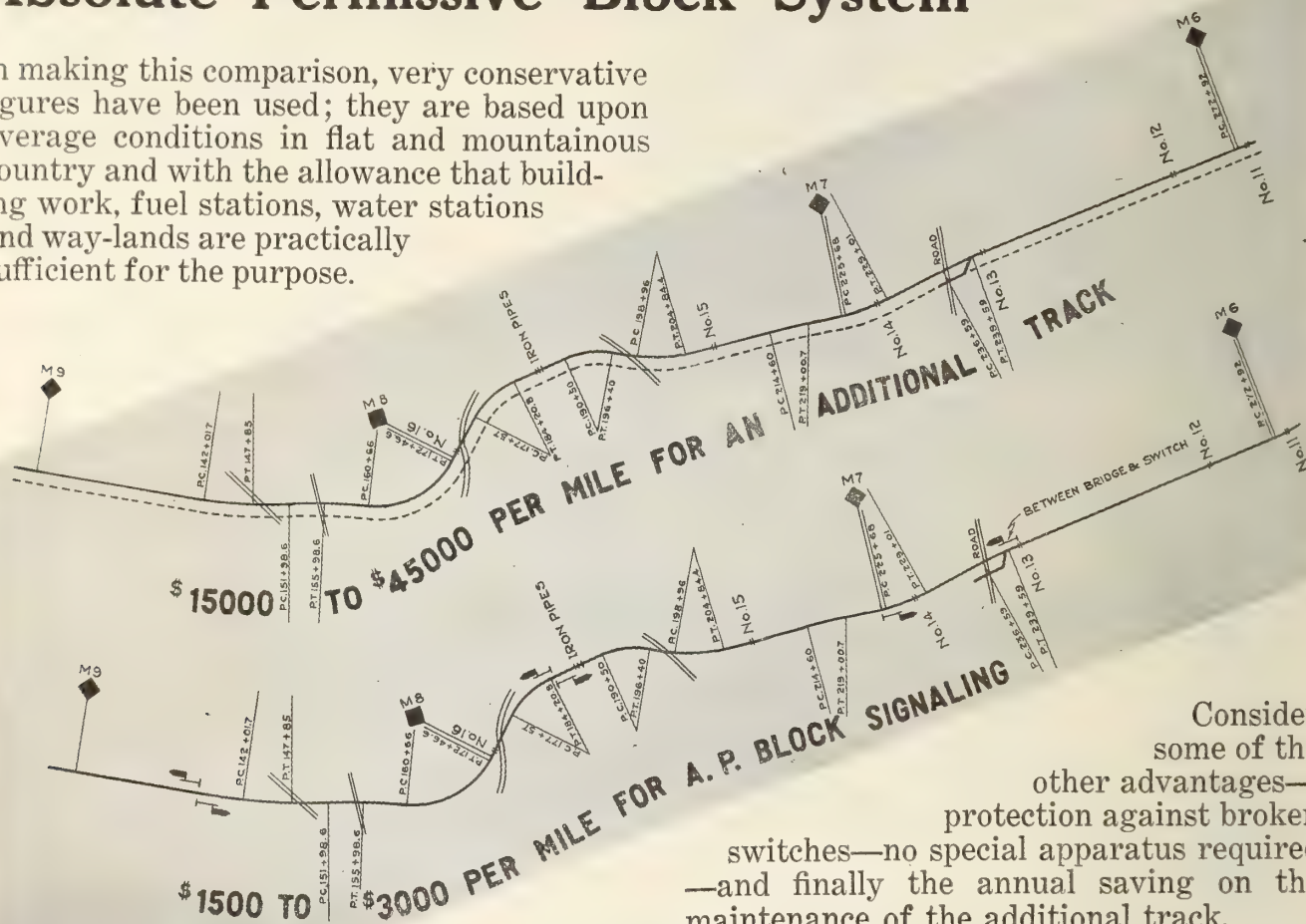
Locomotive Driver and Truck Shoes. Freight and Passenger Car and Electric Car Shoes.

It Pays

to carry an advertisement in the Canadian Railway and Marine World every issue of the year because you obtain proportionately better

Results

In making this comparison, very conservative figures have been used; they are based upon average conditions in flat and mountainous country and with the allowance that building work, fuel stations, water stations and way-lands are practically sufficient for the purpose.



This facilitation of traffic which the A. P. B. System gives, approaches the results from double track operation and is secured at about 1-10 the cost of an additional track.

Consider some of the other advantages—protection against broken switches—no special apparatus required—and finally the annual saving on the maintenance of the additional track.

With all these advantages inherent in the A. P. Block System is double tracking warranted? Then why not consider the proposition in the same way one superintendent did whom we know of. This superintendent, of an important railway, recommended to his management an appropriation of a large sum of money for a second track. After careful investigation, it was found that the expense of the second track could be avoided by an installation of our A. P. Block System: this authority was granted, the system has been installed, and it has postponed double tracking that particular line for many years to come.

You can make the same postponement.

"Safety First"

GENERAL RAILWAY SIGNAL COMPANY OF CANADA LIMITED



Branch Office, Winnipeg, Manitoba

Professional Cards**JACOBS & DAVIES, Inc.**
Consulting EngineersMONTREAL LONDON NEW YORK
Foundations, Subaqueous and Land Tunnels, Subways, Railways, Harbours, Waterpower Development, Examinations, Reports.

Montreal Office: Eastern Townships Bank Building

ANGUS SINCLAIR, C.E.

RAILWAY CONTRACTOR

Office: Imperial Bank Building
King and Sherbourne Sts., Toronto**The TERRY & TENCH CO., Inc.**

Bridge Builders, Manufacturers of Dericks, Erection Plant and Shipyard Cranes. Contractors, Structural Steel, Erection.

Grand Central Terminal. Room 5717,
New York, N.Y.**THE ARNOLD COMPANY**ENGINEERS—CONSTRUCTORS.
ELECTRICAL—CIVIL—MECHANICAL
Reports, Design and ConstructionComplete Railway Shop and Terminal Properties—
Electrification of Steam Railroads.Our Experience Covers Thirty Five Plants
Chicago, Illinois**Patent Solicitors****PATENTS**HERBERT J. S. DENNISON,
Mechanical Engineer. Patent Attorney and Expert.
Patents, Trade Marks, Designs, Copyrights, and
Infringements.20 yrs. experience in Patents and Practical Engineering
Star Building, 18 King St. West, Toronto.

Write For Booklet

**PATENTS SECURED OR OUR
FEES RETURNED.**Being next door to the Patent Office, we have personal
interviews with Examiners, thus earlier allowance of
your Patents. We have access to all Records and solicit
the business of Manufacturers, Engineers, and others
who realize the advisability of having their Patent
business transacted by Experts.HAROLD C. SHIPMAN & CO. REG. PATENT ATTORNEYS
Ottawa, Canada**VAN-HALLEN & O'NEIL**

REGISTERED ATTORNEYS

at Washington and Solicitors of Canadian
and Foreign Patents, Copyrights, Trade
Marks, Searches.Head Office, 103 Farmer Bldg., 333 Main Street,
WINNIPEG, MAN., Canada.**ROSS THOMSON & CO.**Mechanical and Electrical Engineers,
Patent Attorneys.

Send for free book Patent Protection.

HOPE CHAMBERS, OTTAWA, ONT.

ROBERT W. HUNT,
President.THOS. C. IRVING, JR.,
Vice-President.JAS. W. MOFFAT,
Secretary.CHARLES WARNOCK,
Treasurer & Manager.**ROBERT W. HUNT & CO., LIMITED**BUREAU OF INSPECTION
TESTS AND CONSULTATIONExpert examination and tests of material. Inspection of
Steel Rails and Fastenings, Cars, Locomotives, Bridges,
Structural Material, Cast Iron Pipe, etc. Resident in-
spectors located at all important manufacturing centres.

HEAD OFFICE, LABORATORIES:

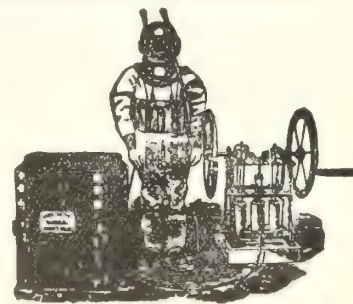
McGill Building, - - - MONTREAL, QUE.

BRANCH OFFICES—Traders Bank Building, Toronto, Ont.

Standard Bank Building, Vancouver, B.C.

Norfolk House, Laurence Pountney Hill, London, E.C.

808 McArthur Bldg., Winnipeg, Man.

**Complete Hydraulic Equipment
For Railway and Ship Building Plants**Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc.
Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast
Iron Pipe, Hydrants, Valves and Fittings, etc.**R. D. WOOD & CO. Philadelphia, Pa.***Rails, Cars,
Locomotives
and Contractors' Equipment***IMMEDIATE
SHIPMENT****John J. Gartshore**58 FRONT ST. WEST
TORONTO**JOHN DATE**

Manufacturer of

Diving Apparatus

For Sale or Hire

Brass Founder and Coppersmith
13-15 Concord St., Montreal**Railway and Contractors'
Equipment.****Freight and Passenger
Locomotives.****Freight Cars of All Types.
Passenger Coaches, Private
Cars.****Steam Shovels and Rails.***Inquiries Solicited***James T. Gardner**

INCORPORATED

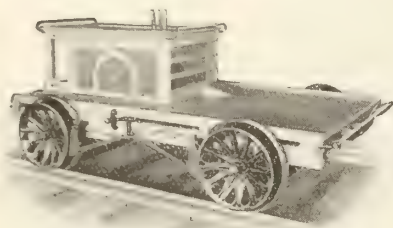
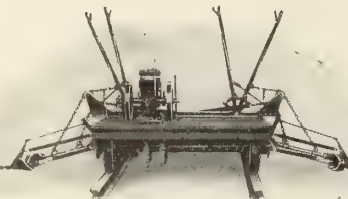
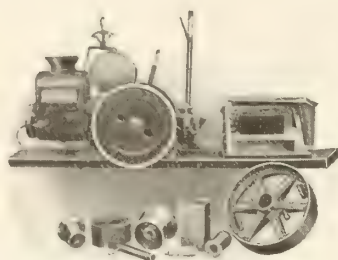
615 Railway Exchange, Chicago, Ill.

Car Closets

FLUSH OR DRY

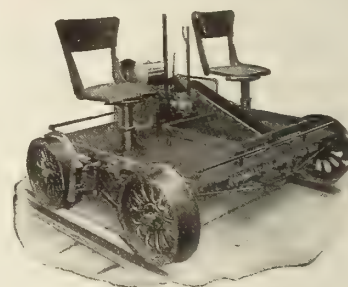
DUNER CO. 101 S. CLINTON ST.
CHICAGO

FAIRMONT WINS GOLD MEDAL



The excellence of FAIRMONT Railway Motor Cars is attested by their receiving the highest competitive award, a gold medal, at the Panama-Pacific International Exposition, San Francisco.

Years of good service on Canadian railroads has proven the justice of this award. When you need a motor car, specify "FAIRMONT". Instalment terms to private buyers.



FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

Formerly Fairmont Machine Co. - 445 N. MAIN ST., FAIRMONT, MINNESOTA, U.S.A.

KINNEAR

FOR PIER SHEDS-FREIGHT HOUSES-ROUND HOUSES & SHOPS

THE KINNEAR MFG. CO.
COLUMBUS, OHIO. U. S. A.

CANADIAN REPRESENTATIVES

EASTERN & CENTRAL
MUSSENS LTD. MONTREAL

BRITISH COLUMBIA
W. N. O'NEIL & CO. VANCOUVER

STEEL ROLLING DOORS & SHUTTERS
BI-FOLDING & SLIDING DOORS
APPROVED FIRE DOORS



MALLEABLE IRON CASTINGS

Our experience and unexcelled equipment assure you the best service in high class castings.

We also manufacture a full line of malleable cast iron and flanged pipe fittings.

International Malleable Iron Co., Limited
GUELPH, ONTARIO

JUST ISSUED RAILWAY MAPS

of the Dominion of Canada
Showing all Railway Lines and Stations,
complete and up to date.
Published in 6 sheets, 30 inches x 22
inches, on border lines.
Scale 1 inch to 20 miles.

Valuable and interesting for all Transportation, Manufacturing, Commercial and Financial Concerns and individuals.
Price, in black and white, \$10.00 per set,
or three sets for \$25.00,
or with Railway systems, etc., colored,
\$15.00 per set., can be had from
EWING, LOVELACE & TREMBLAY
Civil Engineers and Land Surveyors,
14 Phillips Square, Montreal.

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies

ACETYLENE
Commercial Acetylene Ry., Lt. & Sig. Co.
AERATED WATERS
E. L. Drewry
AIR BRAKES AND FITTINGS
Canadian Westinghouse Co.
ALES
E. L. Drewry
ANGLE BARS
Steel Co. of Canada
ASBESTOS
Can. H. W. Johns-Manville Co.
AUTOMOBILES
Preston Car & Coach Co.
AXLES
Nova Scotia Steel and Coal Co.
Jas. W. Pyke & Co.
Steel Co. of Canada
BATTERIES, DRY
Canadian National Carbon Co.
BATTERIES, SIGNAL
Canadian National Carbon Co.
BATTERIES, STORAGE
Canadian National Carbon Co.
BATTERIES, TRACK
Canadian National Carbon Co.
BATTERY SUPPLIES
Canadian National Carbon Co.
BEACONS
Safety Car Htg. & Ltg. Co.
BOILER COMPOUND
Dearborn Chemical Co. of Canada
BOILERS
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works
BOILERS, PORTABLE
F. H. Hopkins & Co.
Polson Iron Works
BOILERS, STATIONARY AND MARINE
Polson Iron Works
BOILERS, STEAM
Polson Iron Works
BOILERS, WATER TUBE
Babcock & Wilcox
Polson Iron Works
BOLTS AND NUTS
Steel Co. of Canada
BOLTS, TRACK
F. H. Hopkins & Co.
Nova Scotia Steel & Coal Co.
Steel Co. of Canada
BORERS, CAR WHEEL
John Bertram & Sons Co.
BRAKE BEAMS
Buffalo Brake Beam Co.
BRAKE SHOES
Amer. Brake Shoe & Fdry. Co.
Canadian Brakeshoe Co.
BRIDGE NUMBERS
Acton Burrows, Limited
BRIDGES
Canadian Bridge Co.
Dominion Bridge Co.
BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION
Canadian National Carbon Co.
BUCKETS, COAL, ORE AND CONCRETE
M. Beatty & Sons
Brown Hoisting Machinery Co.
F. H. Hopkins & Co.
BUILDINGS, STEEL
Canadian Bridge Co.
Dominion Bridge Co.
BUMPING POSTS
F. H. Hopkins & Co.
CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED
Standard Und. Cable Co. of Can.
CARBONS, ARC LAMP, FLARE ARC AND PHOTOGRAPHIC
Canadian National Carbon Co.
CARBON SPECIALTIES
Canadian National Carbon Co.
CAR ROOFING
Franklin Railway Supply Co.
F. H. Hopkins & Co.
CAR SIGNAL SYSTEMS
Ohio Brass Co.
CASTINGS
Crosen Car Co.
CASTINGS, BRASS
Canadian Bronze, Limited

CARS
Crosen Car Co.
J. T. Gardner
Hart-Otis Car Co.
National Steel Car Co.
Ottawa Car Mfg. Co.
Preston Car & Coach Co.
CASTINGS, CAR
Amer. Brake Shoe & Fdry. Co.
CASTINGS, IRON
Hunt-Spiller Manufacturing Corp.
CASTINGS, IRON AND STEEL
Amer. Brake Shoe & Fdry. Co.
Dominion Steel Foundry Co.
CASTINGS, MALLEABLE
International Mall. Iron Co.
Taylor & Arnold
CASTINGS, MANGANESE STEEL
Canadian Steel Foundries, Ltd.
CASTINGS, STEEL
Dominion Steel Foundry
CATENARY MATERIALS
Ohio Brass Co.
CHAINS
B. J. Coglin Co.
F. H. Hopkins & Co.
CLOSETS, CAR
Duner Co.
COAL
Nova Scotia Steel and Coal Co.
COMPRESSORS, AIR
F. H. Hopkins & Co.
CONCRETE MIXERS & ROCK CRUSHERS
F. H. Hopkins & Co.
CONTRACTORS' SUPPLIES
F. H. Hopkins & Co.
Rice Lewis & Son
CONVEYORS, COAL AND ASH
Babcock & Wilcox
COPPER, RODS AND WIRE
Standard Und. Cable Co. of Can.
COUPLERS, CAR & LOCOMOTIVE
Canadian Steel Foundries, Ltd.
Ohio Brass Co.
Taylor & Arnold
CRANES
Brown Hoisting Machinery Co.
Coles, Henry J.
F. H. Hopkins & Co.
CRANES, WRECKING
Coles, Henry J.
F. H. Hopkins & Co.
CRANES, ELECTRIC
Babcock & Wilcox
Coles, Henry J.
Dominion Bridge Co.
F. H. Hopkins & Co.
CRANES, TRAVELLING
Coles, Henry J.
F. H. Hopkins & Co.
CROWBARS
B. J. Coglin Co.
CULVERTS
Pedlar People, Ltd.
CURTAINS AND FIXTURES, CAR
Du Pont Fabrikoid Co.
Preston Car & Coach Co.
CUTS
Acton Burrows, Limited
DERRICKS
M. Beatty & Sons
F. H. Hopkins & Co.
DIES
Butterfield & Co.
DITCHERS
M. Beatty & Sons
F. H. Hopkins & Co.
DIVING OUTFITS
John Date
F. H. Hopkins & Co.
DOORS, STEEL ROLLING
Kinnear Manufacturing Co.
DOOR SIGNS
Acton Burrows, Limited
DRAFT GEAR
Standard Coupler Co.
DREDGES
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works
DRILLS
John Morrow Srew & Nut Co.
DRILLS, AIR
F. H. Hopkins & Co.
Independent Pneumatic Tool Co.

DRILLS, WELL
F. H. Hopkins & Co.
DUMP CARS, CONTRACTORS'
Hart-Otis Car Co.
F. H. Hopkins & Co.
DYNAMO AND ELECTRIC CASTINGS
Amer. Brake Shoe & Fdry. Co.
ECONOMIZERS
Babcock & Wilcox
ELECTRIC APPARATUS
Canadian Fairbanks-Morse Co.
ELECTRIC CAR ROUTE SIGNS
Acton Burrows, Limited
Preston Car & Coach Co.
ENAMELED IRON SIGNS
Acton Burrows, Limited
ENGINES, AUTOMATIC
Polson Iron Works
ENGINES, HOISTING
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works
ENGINES, STATIONARY AND MARINE
Polson Iron Works
ENGINES, STEAM
F. H. Hopkins & Co.
EXPRESS OFFICE SIGNS
Acton Burrows, Limited
FARE BOX HOLDERS
Coleman Fare Box Co.
FARE BOXES, P.A.Y.E. OPERATION
Coleman Fare Box Co.
FARE BOXES, PORTABLE AND STATIONARY
Coleman Fare Box Co.
FILES
Nicholson File Co.
FORGINGS
Champion Machine & Fdry. Co.
Crosen Car Co.
Nova Scotia Steel & Coal Co.
Steel Co. of Canada
FURNACES, OIL AND GAS
Railway Materials Co.
GAUGE COCKS
Ohio Brass Co.
GAUGES, LOCOMOTIVE
Taylor & Arnold
GRATES, SHAKING
Babcock & Wilcox
Polson Iron Works
HAMMERS, CAST STEEL
Amer. Brake Shoe & Fdry. Co.
HANDCARS
Crosen Car Co.
F. H. Hopkins & Co.
Rice Lewis & Son
HANGERS, CABLE
Standard Und. Cable Co. of Can.
HEADLIGHTS
Commercial Acetylene Ry. Lt. and Sig. Co.
Safety Car Htg. & Ltg. Co.
HEADLININGS
Crosen Car Co.
HEATING, CAR
Chicago Car Heating Co.
Consolidated Car Heating Co.
Safety Car Htg. & Ltg. Co.
HOISTS, PNEUMATIC
Taylor & Arnold
HOISTS, STEAM
M. Beatty & Sons
HOOKS
Steel Co. of Canada
HOPPERS, CAR, WET OR DRY
Duner Co.
HOSE, AIR BRAKE AND STEAM
Can. H. W. Johns-Manville Co.
Safety Car Htg. & Ltg. Co.
ILLUSTRATIONS
Acton Burrows, Limited
INSPECTIONS
R. W. Hunt & Co.
INSULATORS, PORCELAIN
Ohio Brass Co.
INSURANCE, ACCIDENT
Imperial Guar. & Acc. Ins. Co.
INTERLOCKING PLANT AND SIGNALS
Canadian Steel Foundries, Ltd.
Gen. Railway Signal Co. of Can.
Saxby & Farmer

IRON AND STEEL BARS
Steel Co. of Canada
IRON, PIG
Nova Scotia Steel and Coal Co.
Steel Co. of Canada
IRON SIGNS
Acton Burrows, Limited
JACKS
Canadian Brakeshoe Co.
Canadian Steel Foundries, Ltd.
F. H. Hopkins & Co.
A. O. Norton, Limited
JOURNAL BEARINGS
Canadian Bronze, Limited
Crosen Car Co.
Jas. W. Pyke & Co.
LAGER BEER, ETC.
E. L. Drewry
LAGGING AND COVERING, LOCOMOTIVE
Can. H. W. Johns-Manville Co.
Taylor & Arnold
LAMPS AND LANTERNS
F. H. Hopkins & Co.
The Hiram L. Piper Co.
LAMPS, GAS
Commercial Acetylene Ry. Lt. and Sig. Co.
Safety Car Heating & Light. Co.
LAMPS, INCANDESCENT
Canadian Westinghouse Co.
LATHES
John Bertram & Sons Co.
LIGHTING, BUOY
Safety Car Heating & Light. Co.
LIGHTING, CAR
Commercial Acetylene Ry. Lt. and Sig. Co.
Safety Car Htg. and Ltg. Co.
LIGHTING, SIGNAL
Commercial Acetylene Ry. Lt. and Sig. Co.
LIGHTS, CONTRACTORS' AND WRECKING
F. H. Hopkins & Co.
LINE MATERIAL
Ohio Brass Co.
LOCOMOTIVES, CONTRACTORS'
Canadian Locomotive Co.
Montreal Locomotive Works
F. H. Hopkins & Co.
LOCOMOTIVES, ELECTRIC
Montreal Locomotive works
LOCOMOTIVES, LOGGING
Canadian Locomotive Co.
F. H. Hopkins & Co.
Montreal Locomotive Works
LOCOMOTIVES, RACK
Canadian Locomotive Co.
Montreal Locomotive Works
LOCOMOTIVES, STEAM
Canadian Locomotive Co.
J. T. Gardner
F. H. Hopkins & Co.
Montreal Locomotive Works
LORRIES, TRACKLAYING
Crosen Car Co.
F. H. Hopkins & Co.
LUBRICATORS
Canadian Detroit Lubricator Co.
Taylor & Arnold
MACHINES AND PLANT, CONTRACTORS'
M. Beatty & Sons
J. T. Gardner
F. H. Hopkins & Co.
MACHINES, BORING AND TURNING
John Bertram & Sons Co.
MACHINES, CAR SHOP
John Bertram & Sons Co.
MACHINES, CEMENT
Jas. W. Pyke & Co.
MACHINES, DRILLING
John Bertram & Sons Co.
MACHINES, HOISTING
M. Beatty & Sons
Brown Hoisting Machinery Co.
MACHINES, HYDRAULIC
R. D. Wood & Co.
MACHINES, MILLING
John Bertram & Sons Co.
MACHINES, PLANING AND SHAPING
John Bertram & Sons Co.

Flange Lubrication Should be Automatic

Flange lubrication to be efficient should be automatic, absolutely independent of your engineer, and at the same time the device itself should be so simple and yet so accurate that it will be practically trouble proof. The

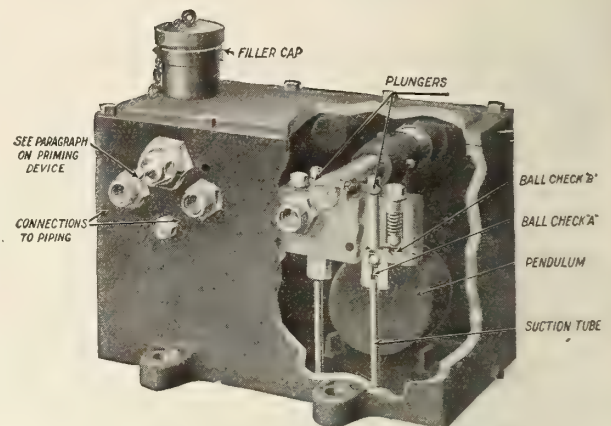
Detroit Automatic Flange Lubricator (Pendulum Type)

is absolutely automatic and at the same time simple. It is all in the pendulum. Any lateral movement of the locomotive causes the pendulum to swing. This oscillation rotates, rocker-like, the pendulum shaft, which produces alternating strokes of the two plungers in the pumping unit.

The use of the Detroit Automatic Flange Lubricator insures positive lubrication just when it is needed. May we send booklet F-O 81? It contains all the facts as well as drawings. Write to-day.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.
WALKERVILLE, ONT.

Canadian Sales Agents: Taylor & Arnold, Ltd., Montreal.



RAILWAY EXCHANGE

CHICAGO

FERGUSON-SHOP FURNACES
MANUFACTURED IN CANADA
THE RAILWAY MATERIALS CO.

SINGER BUILDING

NEW YORK

C. W. Sherman, Pres. and Gen. Mgr.

F. W. Baillie, Vice-Pres.

J. E. Hammond, Secy.-Treas.

Dominion Steel Foundry Company, Limited, Hamilton, Ont.

Locomotive Frames

Car Bolsters

Car Castings

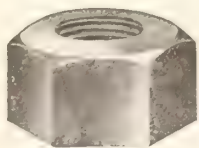
Heavy Machinery Castings

CHICAGO CAR HEATING CO.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES.

CANADIAN FACTORY AND OFFICE—61 DALHOUSIE ST., MONTREAL **A. D. BRUCE, Agent**

GENERAL OFFICES:
RAILWAY EXCHANGE, CHICAGO, U.S.A.
NEW YORK, GRAND CENTRAL TERMINAL BLDG.
ATLANTA, GA., CANDLER BLDG.
WASHINGTON, D.C., MUNSEY BLDG.



If you buy "Morrow" Drills you will have satisfaction. Send us your orders.

John Morrow Screw & Nut Co., Limited
Ingersoll, Ontario.

J-M ASBESTOS & MAGNESIA RAILROAD SUPPLIES

Roofings
Shingles
Packings
Gaskets
Hair Felt
Cements

Locomotive Lagging
Air Brake Cylinder
Packing Expander Ring
Underground Conduit
Leak-No Metallic Compound
Fire Extinguishers

Pipe Coverings
Smoke Jacks
Asbestos Wood
Fibre Conduit
Insulation
Metal Polish

Electrical Supplies
Overhead Line Material
Rail Bonds and Tools
"Noark" Fuse Devices
Waterproofing Materials
Fuse, Service and Subway
Boxes, etc., etc.

Write Nearest Branch for Catalog No. 252.
THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED

Toronto, Ont. Montreal, Que. Winnipeg, Man. Vancouver, B.C. London, England.

The Beer Which Adds
Prestige to a House

**DREWRY'S
American
STYLE RICE
BEER**

Please your Patrons
by serving the best.

E. L. Drewry, Ltd., Winnipeg

January, 1916.]

MACHINES, RADIAL DRILLING
John Bertram & Sons Co.

MACHINES, RAIL DRILLING
F. H. Hopkins & Co.

MACHINES, RIVETTING
Long & Allstatter Co.

MACHINES, SLOTTING
John Bertram & Sons Co.

MACHINES, TRACKLAYING
F. H. Hopkins & Co.

MACHINE TOOLS
John Bertram & Sons Co.
Pratt & Whitney Co.

MANHOLE FRAMES & COVERS
Amer. Brake Shoe & Fdry. Co.

MARINE REPAIRS
Goldschmidt Thermit Co.

MARINE SUPPLIES
Rice Lewis & Son

METALS
Goldschmidt Thermit Co.

METAL WORK, STRUCTURAL
Canadian Bridge Co.
Dominion Bridge Co.
Jas. W. Pyke & Co.

MILEPOST NUMBERS
Acton Burrows, Limited

MONEL METAL
International Nickel Co.

MOTOR CARS
Fairmont Gas Eng. and Ry.
Motor Car Co.

MOTORS, TURNTABLE
Taylor & Arnold

NAILS, CUT AND WIRE
Steel Co. of Canada

NICKLE, SHEET, ROD, WIRE & TUBE
International Nickel Co.

NICKEL, METALLIC SHOT & INGOTS
International Nickel Co.

NUMBERS
Acton Burrows, Limited

NUT LOCKS
Positive Lock Washer Co.

OFFICE FITTINGS
Can. Office & School Furn. Co.

OFFICE SIGNS
Acton Burrows, Limited

OILS
Galena-Signal Oil Co.

PACKING
Garlock Packing Co.

PILE DRIVERS, RAILWAY
F. H. Hopkins & Co.

PIPE, STEAM
Babcock & Wilcox

PIPE STOCKS
Butterfield & Co.

PIPE, WROUGHT LEAD AND GALVANIZED
Steel Co. of Canada

PLANERS
John Bertram & Sons Co.

PLATFORMS, STEEL
Standard Coupler Co.

PLOUGHS, CONTRACTORS'
F. H. Hopkins & Co.

PORTER
E. L. Drewry

PUMPS
F. H. Hopkins & Co.

PUMPS, CENTRIFUGAL
M. Beatty & Sons
F. H. Hopkins & Co.
R. D. Wood & Co.

PUNCHES AND SHEARS
Long & Allstatter Co.

PUTTY
Steel Co. of Canada

RAIL BONDS
Ohio Brass Co.
Elec. Railway Improvement Co.

RAIL BENDERS
Canadian Steel Foundries, Ltd.

RAIL JOINTS
Goldschmidt Thermit Co.
The Rail Joint Co. of Canada

RAILS, NEW
Algoma Steel Corporation
Dominion Iron & Steel Co.
J. T. Gardner
J. J. Gartshore
F. H. Hopkins & Co.

RAILS FOR RELAYING
J. J. Gartshore
Jas. W. Pyke & Co.

RAILWAY SUPPLIES
Can. H. W. Johns-Manville Co.
Franklin Railway Supply Co.
F. H. Hopkins & Co.
Rice Lewis & Son
The Hiram L. Piper Co.

REAMERS
Butterfield & Co.

REPLACERS, CAR AND LOCOMOTIVE
F. H. Hopkins & Co.

RIVETS
Steel Co. of Canada, Ltd.

ROCK CRUSHERS
F. H. Hopkins & Co.

ROPES, DERRICK
Dominion Wire Rope Co.

RUBBER GOODS
Can. Consolidated Rubber Co.

SANDERS, PNEUMATIC
Ohio Brass Co.

SAWS, HACK
Diamond Saw & Stamping Co.

SCOWS, DUMP AND DECK
M. Beatty & Sons

SCREW PLATES
Butterfield & Co.

SCRAPERS, WHEEL AND DRAG
F. H. Hopkins & Co.

SCREWS, WOOD AND MACHINE
John Morrow Screw and Nut Co.
Steel Co. of Canada

SEMAPHORE ARMS
Acton Burrows, Limited

SEMAPHORES
Saxby & Farmer

SHIPS
Polson Iron Works

SIGNAL HOUSE NUMBERS
Acton Burrows, Limited

SIGNALS
Gen. Railway Signal Co. of Can.
The Hiram L. Piper Co.
Saxby & Farmer

SIGNS
Acton Burrows, Limited

SKYLIGHTS
Kinnear Manufacturing Co.

SNOW PLOUGHS
Crosken Car Co.
F. H. Hopkins & Co.

SPIKES, RAILWAY, SHIP OR PRESSED
Nova Scotia Steel and Coal Co.
Steel Co. of Canada

SPLICING TUBES AND COMPOUNDS
Standard Und. Cable Co. of Can.

SPREADER CARS
F. H. Hopkins & Co.

SPRINGS
Canadian Steel Foundries, Ltd.
B. J. Coghlin & Co.

SPRINKLERS, ELECTRIC
Preston Car & Coach Co.

STAPLES
Steel Co. of Canada

STATION NAME SIGNS
Acton Burrows, Limited

STAYBOLT IRON
Taylor & Arnold

STAYBOLTS, FLEXIBLE
Flannery Bolt Co.

STAYBOLTS, LOCOMOTIVE
Flannery Bolt Co.

STAYBOLT TAPS
Butterfield & Co.

STEAM HAMMERS
John Bertram & Sons Co.

STEAM SHOVELS
M. Beatty & Sons
F. H. Hopkins & Co.

STEAMSHIP SIGNS
Acton Burrows, Limited

STEAM TRAPS
Safety Car Htg. & Ltg. Co.

STEEL
F. H. Hopkins & Co.
Nova Scotia Steel and Coal Co.

STEEL, FIRE BOX
Taylor & Arnold
Canadian Steel Foundries, Ltd.

STEEL FOR AXES
Canadian Steel Foundries, Ltd.

STEEL FOR SAWS
Canadian Steel Foundries, Ltd.

STEEL FOR TIRES
Steel Co. of Canada

STEEL SHAFTING
Nova Scotia Steel and Coal Co.

STEEL PLATES
Jas. W. Pyke & Co.

STEEL, TOOL
Canadian Steel Foundries, Ltd.
F. H. Hopkins & Co.

STOKERS, MECHANICAL
Babcock & Wilcox

STRAINERS
Babcock & Wilcox

SUPERHEATERS
Babcock & Wilcox
Locomotive Superheater Co.

SWITCH TARGETS
Acton Burrows, Limited

TACKS
Steel Co. of Canada

TANKS AND TANK FIXTURES
F. H. Hopkins & Co.
Polson Iron Works

TANKS, PORTABLE ACETYLENE, WELDING
Commercial Acetylene Ry. Lt. and Sig. Co.

TAPS
Butterfield & Co.

TELEGRAPH AND TELEPHONE OFFICE SIGNS
Acton Burrows, Limited

TERMINALS, JUNCTION BOXES
Standard Und. Cable Co. of Can.

THERMIT
Goldschmidt Thermit Co.

TIE PLATES
Algoma Steel Corporation
B. J. Coghlin
Nova Scotia Steel & Coal Co.
Steel Co. of Canada

TICKET CASES
Canadian Office & School Fur. Co.

TIRES, STEEL
Jas. W. Pyke & Co.

TOOLS AND SUPPLIES
F. H. Hopkins & Co.
Pratt & Whitney Co.

TOOLS, CAST STEEL
Amer. Brake Shoe & Fdry. Co.

TOOLS, TRACK
John Bertram & Sons Co.
Canadian Steel Foundries, Ltd.
B. J. Coghlin Co.
F. H. Hopkins & Co.

TOOLS, PNEUMATIC
Independent Pneumatic Tool Co.

TRAMWAY EQUIPMENT
J. J. Gartshore
F. H. Hopkins & Co.

TRACK EQUIPMENT
F. H. Hopkins & Co.

TROLLEY BASES
Ohio Brass Co.

TROLLEY GUARDS
Ohio Brass Co.

TROLLEY RETRIEVERS
Ohio Brass Co.
Trolley Supply Co.

TRUCKS, ELECTRIC CAR
Canadian Steel Foundries, Ltd.

TRUSSES, ROOF
Canadian Bridge Co.
Dominion Bridge Co.

TUBES, BOILER
F. H. Hopkins & Co.

TUBE CLEANERS
F. H. Hopkins & Co.

TURNBUCKLES
Canadian Steel Foundries, Ltd.

TURNTABLES
Canadian Bridge Co.
Dominion Bridge Co.

UPHOLSTERY, CAR
Du Pont Fabrikoid Co.

VALVES
Canadian Detroit Lubricator Co.
R. D. Wood & Co.

VALVES, ANGLE AND GLOBE
Ohio Brass Co.

VALVES, BRASS GATE
Ohio Brass Co.

VALVES, LOCOMOTIVE PUP
Taylor & Arnold

VARNISHES
Berry Bros.

VESSELS
Polson Iron Works

WASHERS
Steel Co. of Canada

WASTE
B. J. Coghlin Co.

WATER SOFTENERS & PURIFIERS
Babcock & Wilcox
Dearborn Chemical Co. of Can.

WELDING
Goldschmidt Thermit Co.

WHEELBARROWS
F. H. Hopkins & Co.

WHEEL GRINDERS
Griffin and Brinkerhoff

WHEELS, CAR
Jas. W. Pyke & Co.

WHITE LEAD
Steel Co. of Canada

WIRE AND WIRE ROPE
Dominion Wire Rope Co.

WIRE, BARE COPPER
Standard Und. Cable Co. of Can.
Steel Co. of Can.

WIRE, BRASS, IRON AND STEEL
Steel Co. of Canada

WIRE, INSULATED, COPPER
Standard Und. Cable Co. of Can.
Steel Co. of Canada

WIRE GOODS, BRIGHT
Steel Co. of Canada

WIRE, TELEGRAPH AND TELEPHONE
Standard Und. Cable Co. of Can.
Steel Co. of Canada

WIRE, TRANSMISSION AND TROLLEY
Standard Und. Cable Co. of Can.

WRENCHES, CAST STEEL
Amer. Brake Shoe & Fdry. Co.

YACHTS
Polson Iron Works

SAXBY & FARMER, LIMITED

511-12 Canadian Express Building, - MONTREAL, QUE.

MAKERS OF RAILWAY SIGNALS, INTERLOCKING APPLIANCES,
HIGHWAY CROSSING GATES AND BELLS

Alphabetical List of Advertisers

A		D		N	
Algoma Steel Corporation	20	Duner Co.	75	National Steel Car Co.	82
American Brake Shoe and Foundry Co.	72	Du Pont Fabrikoid Co.	3	Nicholson File Co.	11
Arnold Co.	75	E		Norton, A. O., Inc.	12
B		Electric Railway Improvement Co.	19	Nova Scotia Steel and Coal Co.	8
Babcock & Wilcox	18	Ewing, Lovelace and Tremblay	76	O	
Beatty, M. & Sons, Co.	25	F		Ohio Brass Co.	9
Berry Bros.	12	Fairmont Gas Engine & Ry. Motor Car Co.	76	Ottawa Car Manufacturing Co.	25
Bertram, John & Sons, Co.	—	Flannery Bolt Co.	15	P	
Bradstreet Company	24	Franklin Railway Supply Co.	70	Pedlar People, Ltd.	16
Brown Hoisting Machinery Co.	4	G		Piper, The Hiram L., Co.	24
Buffalo Brake Beam Co.	22	Galena-Signal Oil Co.	5	Polson Iron Works	24
Burrows—Acton Burrows, Ltd.	72	Gardner, Jas. T., Inc.	75	Positive Lock Washer Co.	73
Butterfield & Co.	23	Garlock Packing Co.	10	Pratt & Whitney Co. of Canada .. 1 and	22
C		Gartshore, J. J.	75	Preston Car and Coach Co.	25
Canadian Brakeshoe Co.	73	General Railway Signal Co. of Canada.	74	Pyke, J. W. & Co.	21
Canadian Bridge Co.	70	Goldschmidt Thermit Co.	14	R	
Canadian Bronze, Ltd.	24	Grand Trunk Railway	13	Rail Joint Co. of Canada	81
Canadian Consolidated Rubber Co.	26	Griffin and Brinkerhoff	25	Railway Materials Co.	78
Canadian Detroit Lubricator Co.	78	H		S	
Canadian Government Railways	80	Hart-Otis Car Co.	9	Safety Car Heating and Lighting Co. ..	13
Canadian H. W. Johns-Manville Co.	78	Hopkins, F. H. & Co.	6	Saxby and Farmer	79
Canadian Locomotive Co.	2	Hunt, Robert W., & Co.	75	Shipman, Harold C., & Co.	75
Canadian Marconi Co.	73	Hunt-Spiller Mfg. Corporation	72	Sinclair, Angus	75
Canadian National Carbon Co.	19	I		Standard Coupler Co.	70
Canadian Northern Railway	10	Imperial Bank of Canada	73	Standard Underground Cable Co. of	
Canadian Office & School Furniture Co.	70	*Imperial Guar. and Acc. Ins. Co.	—	Canada	24
Canadian Pacific Railway	17	Independent Pneumatic Tool Co.	18	Steel Co. of Canada	7
Canadian Steel Foundries, Ltd.	17	International Correspondence Schools ..	23	T	
Canadian Westinghouse Co.	2	International Malleable Iron Co.	76	Taylor & Arnold	22
Champion Machine & Forging Co.	20	International Nickel Co.	70	Terry & Tench Co.	75
Chicago Car Heating Co.	78	J		Thomson, Ross & Co.	75
Coghlin, B. J., Co.	21	Jacobs & Davies	75	Toch Brothers	71
Coles, Henry J., Ltd.	25	K		Trolley Supply Co.	14
Commercial Acetylene Ry. Lt. & Sig. Co.	21	Kinnear Manufacturing Co.	76	V	
Consolidated Car Heating Co.	24	L		Van-Hallen & O'Neill	75
Crossen Car Co.	16	Lewis, Rice & Son	18	W	
D		Locomotive Superheater Co.	20	Wood, R. D. & Co.	75
Date, John	75	Long & Allstatter Co.	11	M	
Dearborn Chemical Co. of Canada ...	15	M		Montreal Locomotive Works	8
Dennis Hotel	73	Morrow, John, Screw & Nut Co.	78	N	
Dennison, H. J. S.	75	N		National Steel Car Co.	82
Diamond Saw & Stamping Works	23	O		Nicholson File Co.	11
Dominion Bridge Co.	25	P		Norton, A. O., Inc.	12
Dominion Iron & Steel Co.	19	Q		Nova Scotia Steel and Coal Co.	8
Dominion Steel Foundry Co.	78	R		O	
Dominion Wire Rope Co.	6	S		Ohio Brass Co.	9
Drewry, E. L.	78	T		Ottawa Car Manufacturing Co.	25

*Advertisements marked with an asterisk appear in alternate issues.

LINKING PRAIRIE WITH OCEAN

Winnipeg
St. John

Cochrane
Halifax

Quebec
Charlottetown

Montreal
The Sydneys

Canadian Government Railways

OPERATE OVER 4,000 MILES OF RAILWAY

Transcontinental Ry., Intercolonial Ry., Prince Edward Island Ry., St. John and Quebec Ry.

MONTREAL AND HALIFAX—Ocean Limited, Daily—Maritime Express, Daily except Saturday—Connection for St. John, Prince Edward Island, Newfoundland except Sunday.

**THROUGH
EXPRESSES**

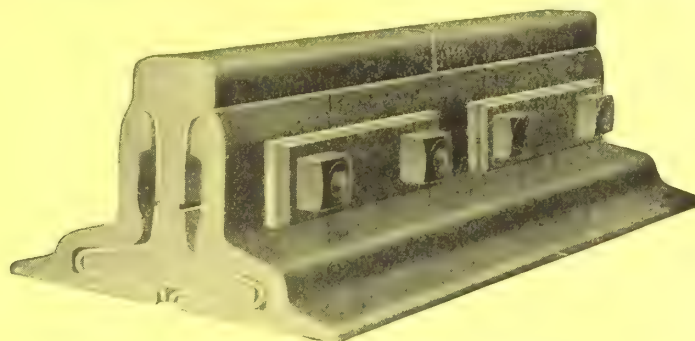
TORONTO AND WINNIPEG—The National (tri-weekly service)—A NEW train via a NEW route through a NEW country.

F. P. GUTELIUS, General Manager. C. A. HAYES, General Traffic Manager. H. H. MELANSON, General Passenger Agent.
Head Offices: MONCTON, N.B.

The Rail Joint Company of Canada Limited

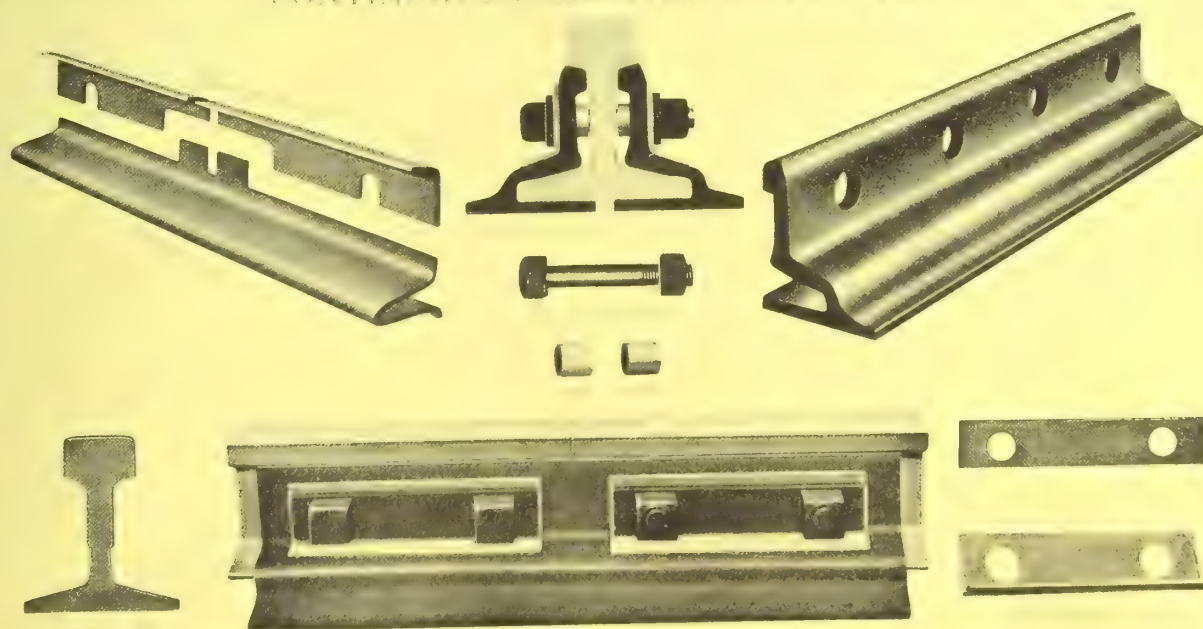
606 McGill Bldg., MONTREAL, CANADA

Makers of Base-Supported and One Hundred Per Cent. Rail Joints for Standard, Girder, and Special Rail Sections. Also Joints for Frogs and Switches; Insulated Rail Joints, and Step or Compromise Rail Joints. Patented in Canada and the United States. Catalogue on Request.



CONTINUOUS INSULATED JOINT AND

CONTINUOUS INSULATED JOINT PARTS



Agencies:

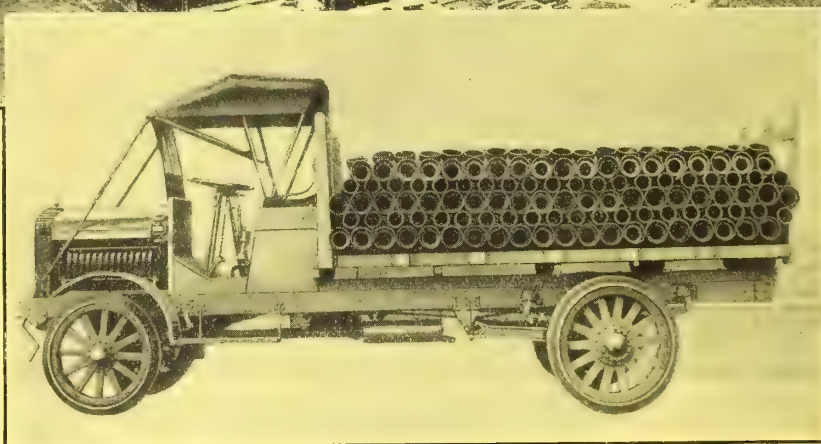
Boston, Mass., India Bldg.; Chicago, Ill., Railway Exchange Bldg.; Denver, Colo., Equitable Bldg.; New York City, N.Y., 185 Madison Avenue; Philadelphia, Pa., Pennsylvania Bldg.; Pittsburg, Pa., Oliver Bldg.; Portland, Ore., Wilcox Bldg.; St. Louis, Mo., Commonwealth Trust Bldg.; Troy, N.Y., Burden Avenue.

London, E.C., Eng. 36 New Broad St.

See our exhibit at the Panama-Pacific International Exposition, Palace of Transportation, Block 1, East End.



THE
PLANT
BEHIND
THE
TRUCK



LARGEST
MAKERS
OF
MOTOR
TRUCKS
IN
CANADA

National Motor Trucks

The existence of a great demand in Canada for a reliable and economical Motor Truck is the reason behind the manufacture of the NATIONAL Truck. Securing a staff of the most experienced and competent engineers obtainable and giving instructions that a Master Truck must be produced, has resulted in a product that is unexcelled. Improvements that would naturally come about in the next few years have been anticipated and embodied in this NATIONAL TRUCK—national in scope and use, as well as in name.

Write for illustrations, specifications and prices.

The Most Modern Plant in Canada for Manufacturing the Best Quality of

Steel and Wood Cars for Railway Freight and Passenger Service. Logging Cars, Dump Cars, Electric Railway Cars, Suburban Cars, Interurban Cars, Under-frames, Brake Beams, Truck Bolsters.

Manufacturers in Canada of the famous "Damascus Brake Beam."

National Steel Car Company, Limited

Works and Operating Office: HAMILTON, ONTARIO

Branch Sales Offices:
LONDON, ENG.

MONTREAL

PARIS, FRANCE

Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 216

TORONTO, CANADA, FEBRUARY, 1916

Subscription Rates, Page 61



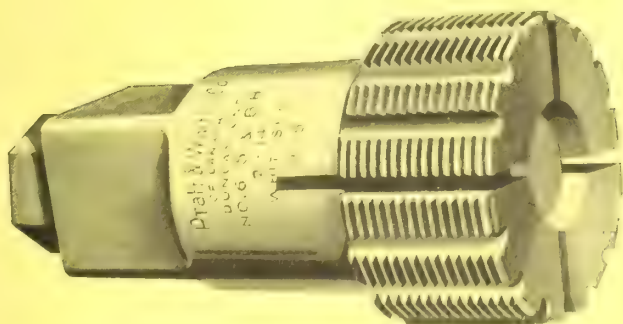
Adjustable Taps for Shell Work

Accuracy is one of the principal requirements demanded in the production of shells. To maintain it in solid taps is too expensive for modern practice.

The simple adjusting device illustrated on this page gives greatly increased life to your taps and ACCURACY at a very reasonable first cost.

We will be glad to tell you about our other lines of adjustable taps which embody

ACCURACY
and
ECONOMY



Pratt & Whitney Co. of Canada, Limited

DUNDAS, ONTARIO, CANADA

MONTREAL
723 Drummond Bldg.

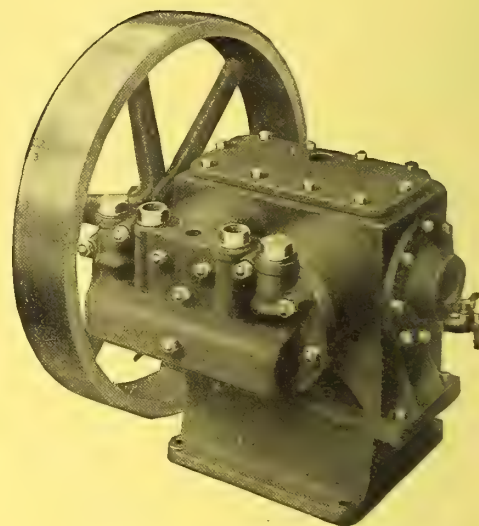
VANCOUVER
609 Bank of Ottawa Bldg.

WINNIPEG
1205 McArthur Bldg.

Westinghouse Belt-Driven Compressors

Compact, efficient, reliable.
May be controlled by an
automatic governor.

The only difference between our
belt-driven and motor-driven com-
pressors is the substitution of a belt
wheel for the motor.



Our nearest office will give full particulars.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

TORONTO MONTREAL OTTAWA HALIFAX FT. WILLIAM WINNIPEG CALGARY EDMONTON VANCOUVER
Traders Bank Bldg. 52 Victoria Square Ahearn & Soper, Ltd. 105 Hollis St. Telfer Bldg. 158 Portage Ave. E. Grain Exchange Bldg. Dominion Bldg. Bank of Ottawa Bldg.

Nova Scotia Steel and Coal Co., Limited

Manufacturers of

MARINE, RAILWAY AND GENERAL ENGINEERING FORGINGS OF ALL SHAPES AND UP TO 40 TONS IN WEIGHT, MADE FROM BEST ORDINARY OR HARMET FLUID COMPRESSED OPEN-HEARTH STEEL. OUR FORGE IS EQUIPPED WITH THE MOST MODERN STEAM HYDRAULIC PRESSES.

RAILWAY TRACK MATERIAL, fish plate, tie plate, track bolts, spikes, tee rails—12 to 40 lbs. per yard.

ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

ALSO MINERS AND SHIPPERS OF THE CELEBRATED "OLD SYDNEY" COAL.
HIGH CALIFORIC VALUE..LOW ASH..UNEXCELLED FOR STEAM-RAISING PURPOSES.
BEST HOUSE COAL MINED IN CANADA.

Collieries, Iron and Steel
Furnaces:
SYDNEY MINES, C. B.

Coal Shipping
Piers:
NORTH SYDNEY, C. B.

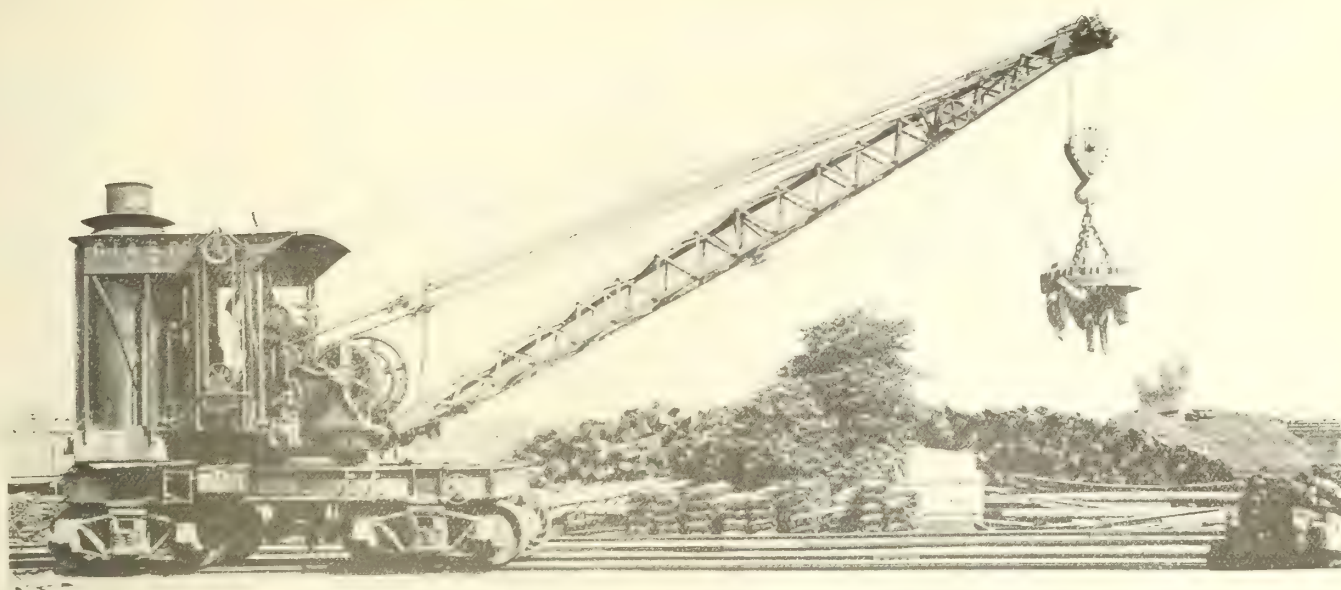
Finishing Mills, Forge, and
Engineering Shops:
NEW GLASGOW, N.S.

ENQUIRIES SOLICITED

Western Steel Sales Office
Room 14, Windsor Hotel,
Montreal, Que.

Western Coal Sales Office:
219, Board of Trade Bldg.,
Montreal, Que.

Head Office :
NEW GLASGOW, N.S.



Why employ 20 to 40 men to handle your material? A

BROWNHOIST Locomotive Crane

will do the same amount of work with a decided saving to you. Its cost, including 6% interest on investment, depreciation, and operating costs, is only \$6.00 to \$10.00 per day. It is one man operated, powerful, quick-acting, and built to withstand hard and continuous service. Records prove this.

ADAPTABILITY. The equipment is interchangeable. It only takes a short time to apply the Grab Bucket, Bottom Block, Drag-Line Bucket, Pile Driving Attachment, Lifting Magnet, or Shovel Equipment. This makes practically six machines in one.

RAILROADS all over the country are realizing more and more the advantage and economy of having a Brownhoist Locomotive Crane on the job, because it is always ready to work in case of emergency. A Brownhoist Crane can be relied upon. One road uses thirty of them.

INVESTIGATE TO-DAY. Catalogue I shows
how and where some of these cranes are used.

THE BROWN HOISTING MACHINERY CO.
CLEVELAND, OHIO

MONTREAL OFFICE, 145 St. James Street

GALENA OILS

HAVE NO EQUAL IN
QUALITY, EFFICIENCY AND ECONOMY

SOLE MANUFACTURERS OF
Celebrated Galena Coach, Engine and Car Oils
LUBRICATION ON A GUARANTEED BASIS

***ELECTRIC RAILWAY LUBRICATION
A SPECIALTY***

Perfection Valve and Signal Oils

Galena Railway Safety Oil—Made especially for use in head-lights, marker and classification lamps.

Galena Long Time Burner Oil—For use in switch and semaphore lamps, and all lamps for long time burning, avoiding smoked and cracked chimneys and crusted wicks.

TESTS AND CORRESPONDENCE SOLICITED

Galena Signal Oil Company

WORKS

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office — 603 Shaughnessy Bldg., Montreal, Que.

The Steel Company of Canada, Limited

HAMILTON, CANADA

Special Steel Marine Forgings

When forgings are required to stand the strain of rough weather, and to prove themselves reliable and dependable, write us for particulars and prices.

We have the facilities for the production of heavy steel forgings of all kinds, including:

Connecting Rods

Crank Shafts

Eccentric or
Cam Forgings

Marine Engine
Forgings

Piston Heads

Piston Rods

Shafting



Stern Frame of Steamship Hamonic

Rounds

Squares

Rudder Frames

Stern Frames

Side Rods

Steam Engine
Forgings

District Sales Offices:

HAMILTON

MONTREAL

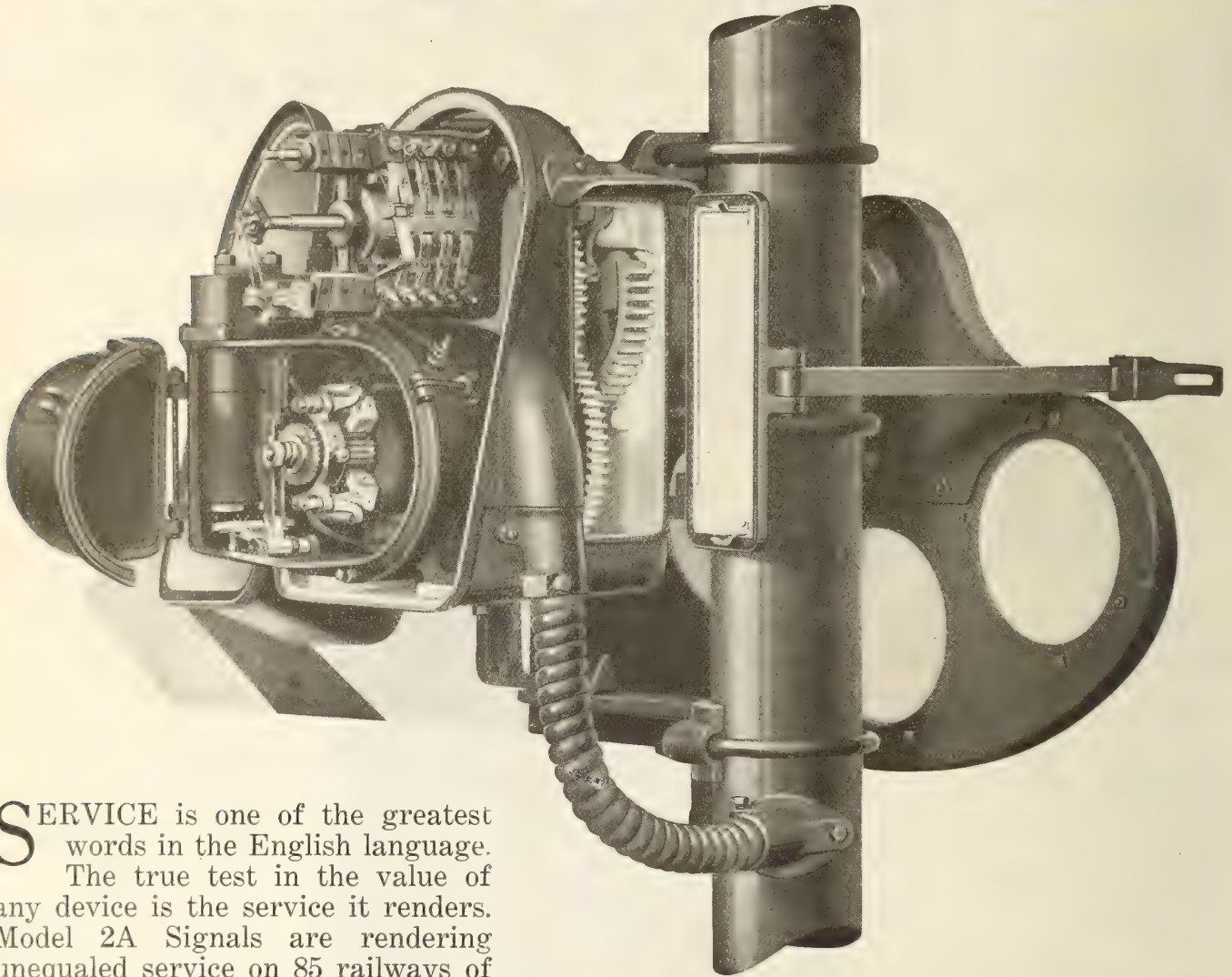
TORONTO

WINNIPEG

W. A. MacLennan, Vancouver, B.C.
J. B. H. Rickaby, Victoria, B.C.

H. G. Rogers, St. John, N.B.
Geo. D. Hatfield, Halifax, N.S.

SERVICE



SERVICE is one of the greatest words in the English language. The true test in the value of any device is the service it renders. Model 2A Signals are rendering unequaled service on 85 railways of North America. Among many features which account for the successful service of the Model 2A Signal are these:

It has neither **slot—dash-pot—fan** nor **governor**.

The fact is recognized by the best signal authorities that the signal slot is a delicate, complicated and unreliable part of any signal, that it is subject to residual magnetism, improper adjustment, battered stop pins and worn bearings.

The elimination of the slot increases the simplicity and results in reliable service of the Model 2A Signal.

Shunting the motor circuit is the substitute for the dash-pot—fan or governor and is a means of retarding the movement of the semaphore blade in moving from proceed to caution and stop positions. It is a highly satisfactory method and the simplest one known.

Bulletin 115-C on request.

“Safety First”

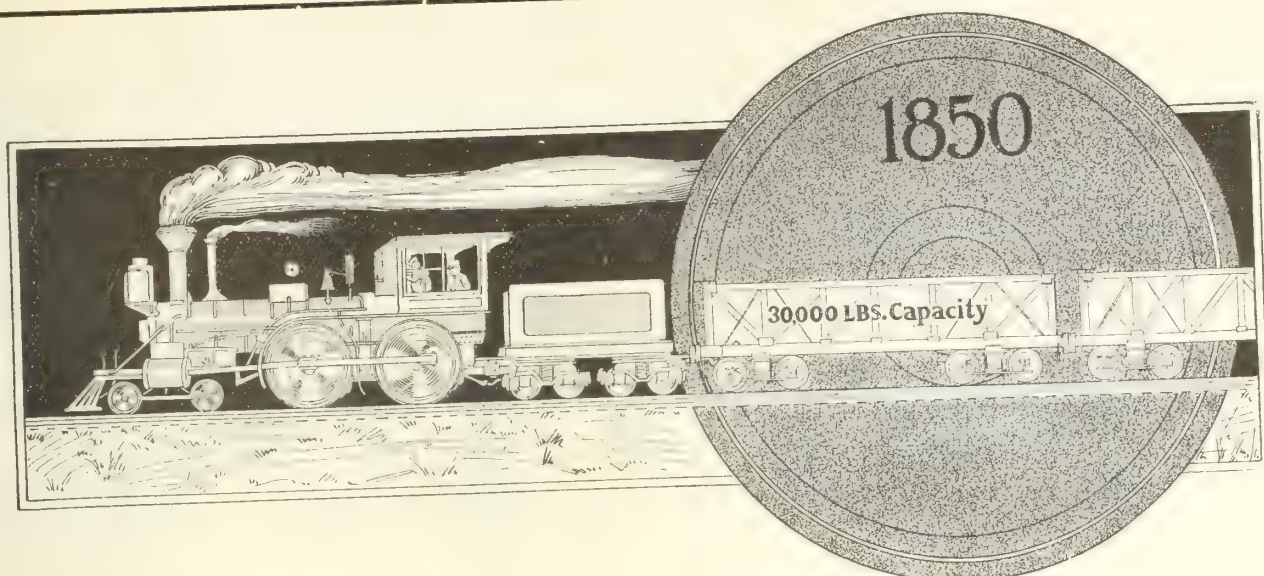
GENERAL RAILWAY SIGNAL COMPANY
OF CANADA LIMITED



Office and Works, Lachine, Quebec

Branch Office, Winnipeg, Manitoba

February, 1916.]



The Wonderful Single Service Chilled Iron Car Wheel

Chilled Iron means the sudden cooling of molten iron poured against a cold iron ring which is part of the mold.

A 725-pound M. C. B. chilled iron car wheel is poured in 12 seconds and by this quick cooling process a transformation of structure takes place and the result is a clear white iron from one-half to three-quarters of an inch in depth in the tread and flange, which is harder than tempered steel.

The chilled tread is so hard that it will carry a heavier load than the steel rail will carry without deformation of the metal.

Scientific tests have demonstrated the difference in structure between the chilled iron wheel and steel rail because a load can be placed on a chilled iron wheel that will cause it to sink into the rail without deformation of the wheel structure.

There is less wear in the brake shoe and steel rail when chilled iron wheels are used; therefore chilled iron possesses the ideal structure for service.

The plates are soft, because the iron in the plates is cooled gradually in a sand mold; therefore they can withstand temperature stresses due to brake heating.

The hub is soft and easily machined; therefore a strong and perfect axle fit is assured.

Note carefully the combination of graded iron structure in the single piece chilled iron wheel namely:

Hard Tread,
Soft Plates,

Soft Hub, and each part of the wheel ideally adapted to service conditions.

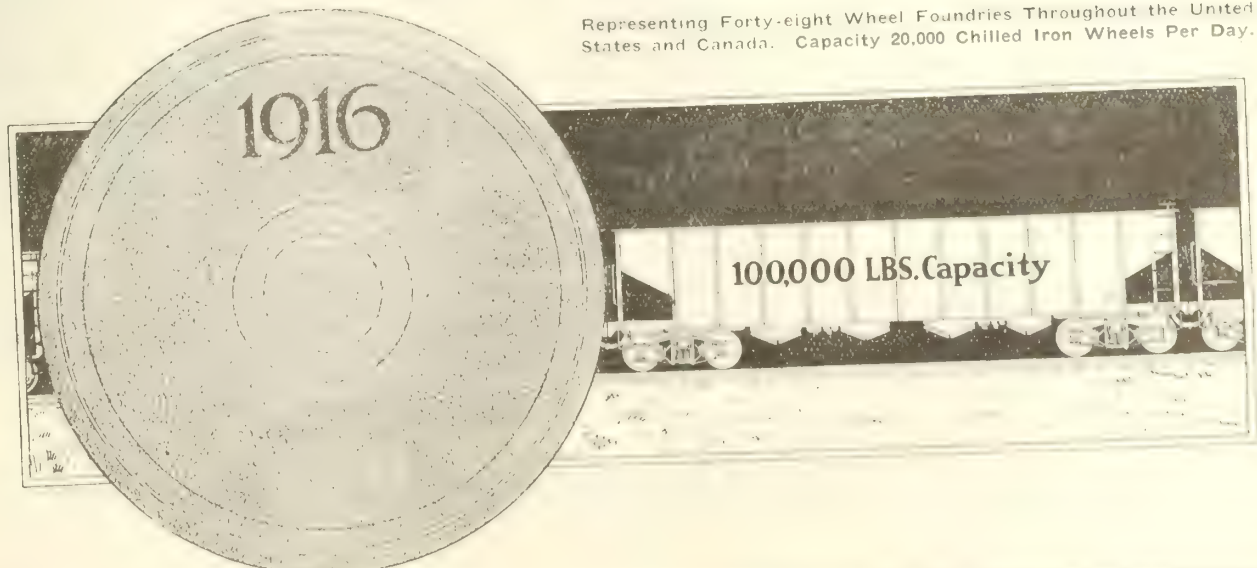
Chilled iron Wheels were Standard in the year 1850.

Chilled Iron Wheels are Standard
25,000,000 now running.

Today.

Association of Manufacturers of Chilled Car Wheels
1214 McCormick Building, Chicago, Ill.

Representing Forty-eight Wheel Foundries Throughout the United States and Canada. Capacity 20,000 Chilled Iron Wheels Per Day.



Shell Box Handles

Approved by the Shell Committee.

If you have any
WIRE ROPE

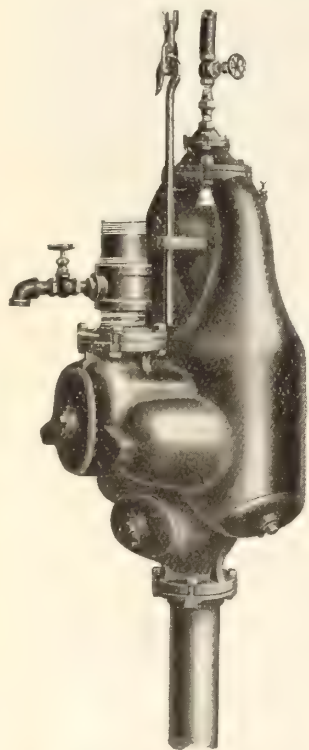
troubles let us help
you.



All sizes and qualities
of
WIRE ROPE

carried in our
Montreal, Winnipeg and
St. Catharines' Stock.

The DOMINION WIRE ROPE CO., Limited, MONTREAL



"MARION"

Railroad Ditchers
Steam Shovels
Drag Line Excavators
Dredges, etc.

"Pulsometer" Pumps
"Hayward" Buckets
"Napanee" Hoisting Engines
"Ransome" Concrete Mixers
"Andrews" Drill and Tool Steel



BRANCH:
St. Catharines, Ont.

F. H. Hopkins & Co

HEAD OFFICE
MONTREAL

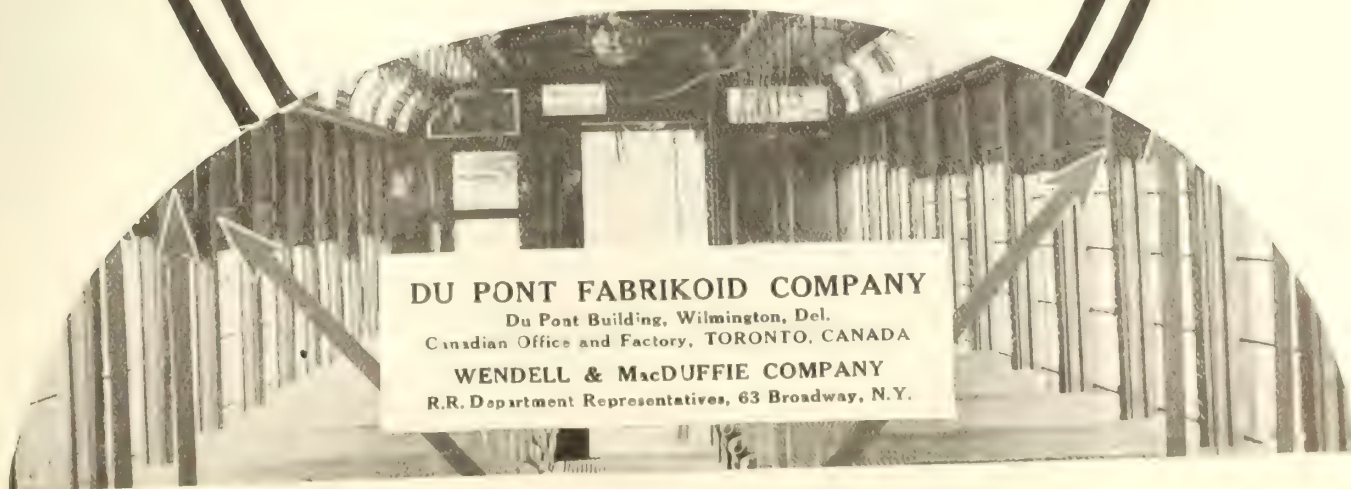


Sanitary
Dustproof
Weatherproof
Durable
Uncrackable
Unshrinkable
Unflakable



For Car Seating and Curtains

More than a satisfactory substitute for leather.
Non-splitting, non-peeling, tough, weatherproof.
Test its durability. Free samples on request.



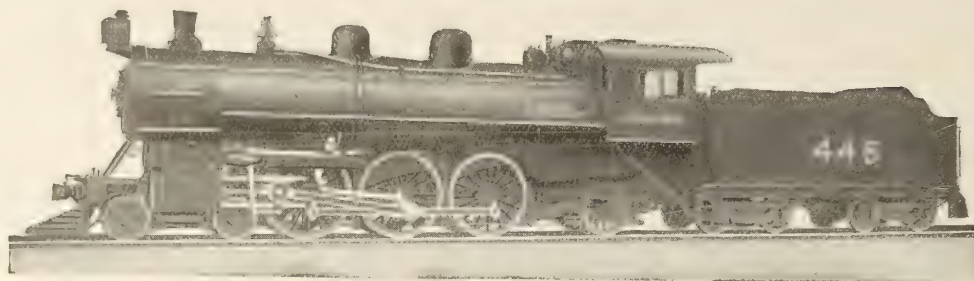
DU PONT FABRIKOID COMPANY

Du Pont Building, Wilmington, Del.
Canadian Office and Factory, TORONTO, CANADA

WENDELL & MacDUFFIE COMPANY

R.R. Department Representatives, 63 Broadway, N.Y.

Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE — INTERCOLONIAL RAILWAY.

Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

MONTREAL LOCOMOTIVE WORKS, LIMITED,

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

Coast to Coast Service

BETWEEN

TORONTO AND VANCOUVER

BY

Canadian Northern Railway

THE NEW ROUTE to Port Arthur, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Prince Albert, North Battleford, Calgary, Edmonton, Kamloops, New Westminster, Vancouver and All Western Points.

Leave TORONTO 10.45 P.M.
Mon., Wed., Fri.

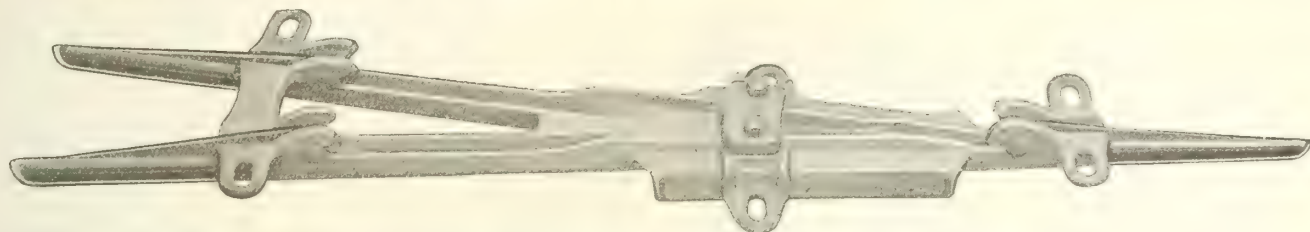


Connections to and from
all points.

ELECTRIC LIGHTED SLEEPERS, DINING CARS AND FIRST-CLASS COACHES.

For full particulars, through tickets to all points and Berth reservations, apply or write to R. L. FAIRBAIRN, General Passenger Agent, 68 King St. E., Toronto, Ont.

A Standard Design With O-B Improvements



Type E High-Speed Trolley Frog

Made along the general lines of the standard Dunc or Detroit design, but equipped with 6 inch renewable bronze Cam Tips. These tips in shorter length have proved a decided success on Type D Frog and other devices.

Body is made of malleable iron and is provided with extra long extensions to steady the trolley wheel and relieve wires of side wear.

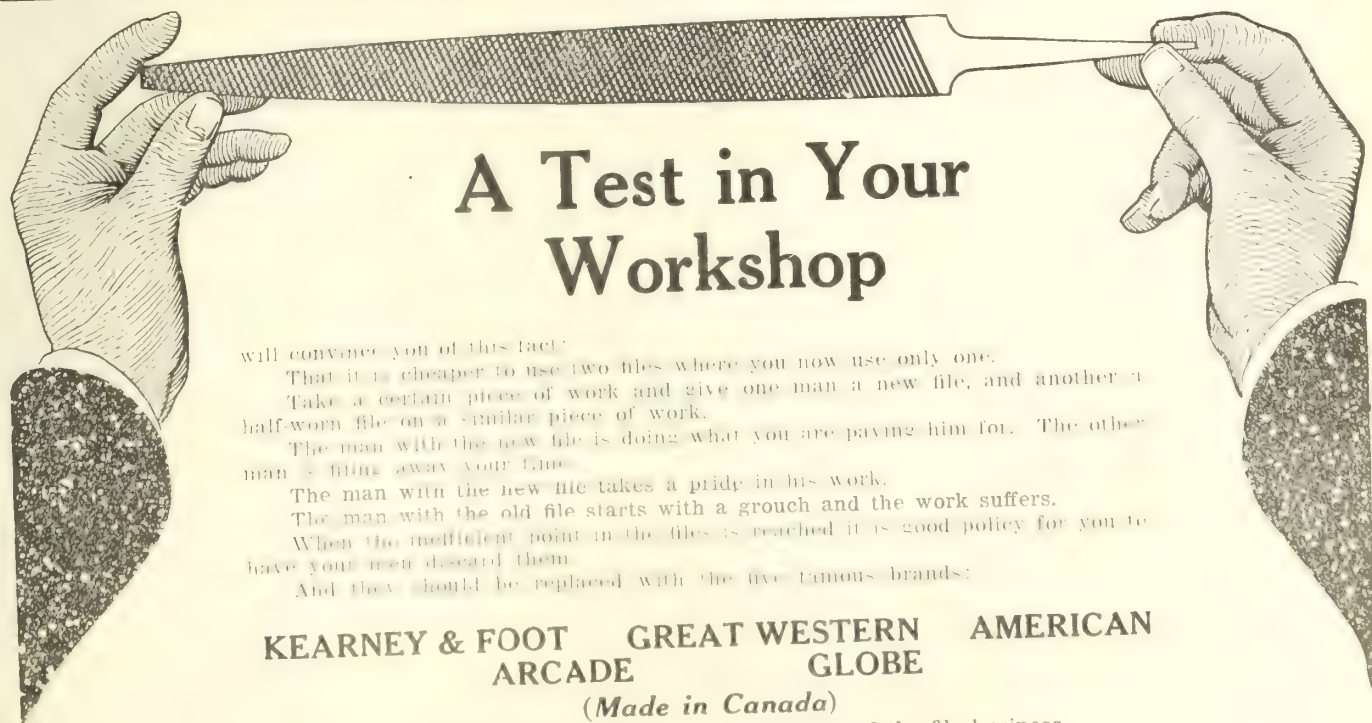
A groove in the pan guides the wheel and overcomes tendency to take turnout when car is passing on a straight line.

Deflector bar prevents wild trolley from catching in the acute angle formed by the turnout wire.

Small number of parts and rugged design mean ease of installation and long life.

Furnished for 0 to 4-0 Round and Grooved wires and for either right hand, left hand or "V" turnout.

THE OHIO BRASS COMPANY, Mansfield, Ohio, U.S.A.



A Test in Your Workshop

will convince you of this fact:

That it is cheaper to use two files where you now use only one.

Take a certain piece of work and give one man a new file, and another a half-worn file on a similar piece of work.

The man with the new file is doing what you are paying him for. The other man is taking away your time.

The man with the new file takes a pride in his work.

The man with the old file starts with a grouch and the work suffers.

When the inefficient point in the files is reached it is good policy for you to have your men discard them.

And they should be replaced with the five famous brands:

KEARNEY & FOOT GREAT WESTERN AMERICAN
ARCADE GLOBE

(Made in Canada)

Made in Canada by a plant controlling 90 per cent. of the file business.

Backed by 50 years' experience in the making of efficient files.

Send for your **FREE** Copy of "File Philosophy" NOW.

NICHOLSON FILE COMPANY

PORT HOPE

(Dealers Everywhere)

ONTARIO

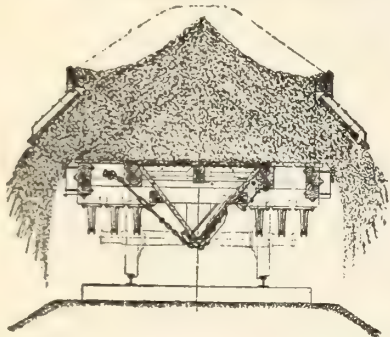
HART CONVERTIBLE CARS ARE MONEY SAVERS IN BALLAST WORK



In Construction Work with Side Plow and Lidgerwood Car



In Ballast Work Centre Dump with Rodger Double Plow Distributing Car



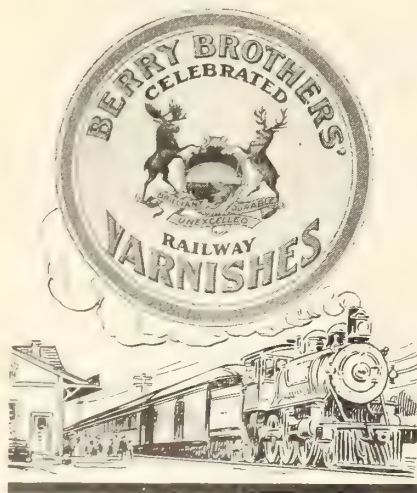
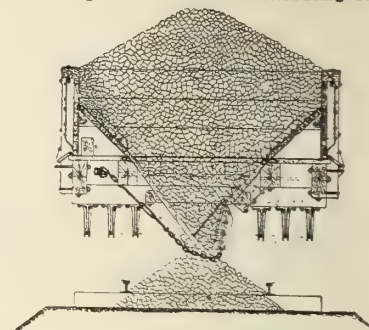
Three Cars in One

BALLAST CAR
CONSTRUCTION CAR
GONDOLA CAR

Use centre dump for ballast and maintenance work and save \$200.00 per mile over any other method.

Use side dump for heavy construction work.

THE HART-OTIS CAR CO. LIMITED
MONTREAL



BERRY BROTHERS' RAILWAY VARNISHES

Impart Greater Beauty of Finish

People willingly pay for appearance because their association with it marks them as folk of good taste and standing. An apartment building that is beautifully designed is more desirable than one of commonplace finish.

BERRY BROTHERS' RAILWAY VARNISHES add to the value of whatever they are applied to, because they increase the merit of its appearance, and appeal to the most critical of all our senses—which is sight.

Let us send you a copy of our Railway Varnish catalog, just issued

BERRY BROTHERS
(INCORPORATED)
World's Largest Varnish Makers

WALKERVILLE

ONTARIO

Garlock High Pressure Piston Rod Packing

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

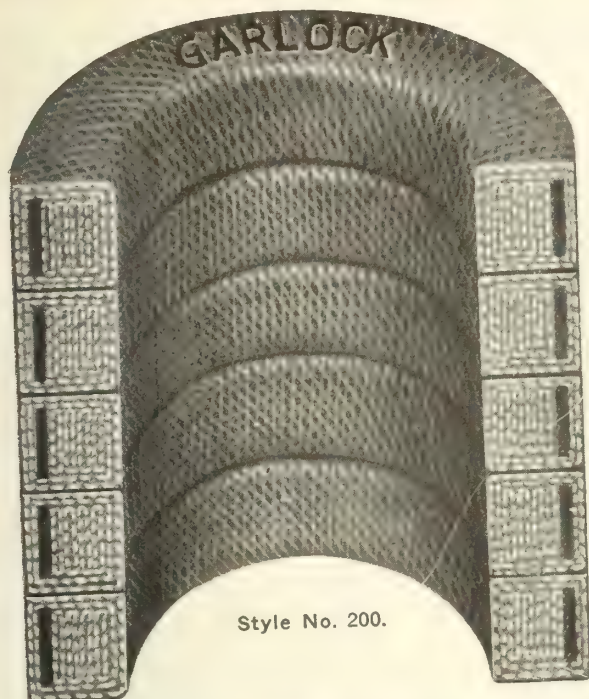
The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.



Style No. 200.

THE GARLOCK PACKING COMPANY

Hamilton, Ontario

Branches:

Montreal, Quebec
Toronto, Ontario
Winnipeg, Manitoba

342 St. James St. East
Continental Life Bldg.
Galt Building



GRAND TRUNK HOTELS

The Chateau Laurier, Ottawa, Ont.

Accommodation 350 Rooms. Rates
\$2.00 per day and upwards. Euro-
pean Plan.

The Fort Garry, Winnipeg, Man.

Accommodation 300 Rooms. Rates
\$2.00 per day and upwards. Euro-
pean Plan.

The Macdonald, Edmonton, Alta.

Accommodation 250 Rooms. Rates
\$2.00 per day and upwards. Euro-
pean Plan.

Hotels under construction—

The Qu' Appelle, Regina.
The Prince Rupert, Prince Rupert.

G. T. BELL,
Passenger Traffic Manager,
Montreal.

The Double Track Route

Provides

SERVICE	COMFORT
SAFETY	COURTESY
SPEED	CONVENIENCE

WINTER TOURS to California and all Pacific Coast Points. Florida, Texas, New Orleans, Etc.

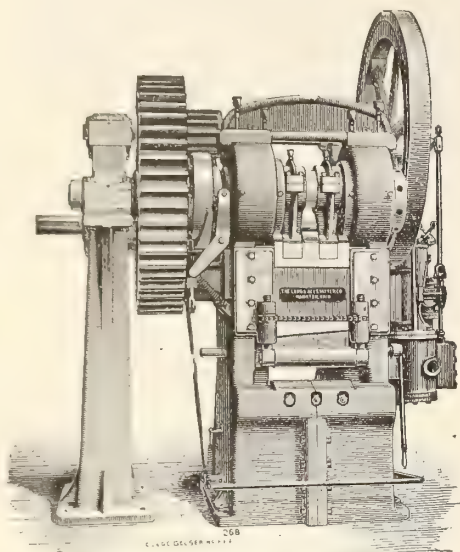
Winter Tours Tickets now on sale. Stop over privilege allowed.

The New Way West

Via the Transcontinental and Grand Trunk Pacific Railway affords new scenery, new interests. Write to any Agent of the Company for a verifying matter, rates, and all particulars.

W. S. COOKSON,
General Passenger Agent,
Montreal.

POWER PUNCHING AND SHEARING MACHINERY



Gate Shear—Steam-Driven

Over 350 sizes and styles for all kinds of light and heavy work designed and manufactured by

THE LONG & ALLSTATTER CO.

Hamilton, Ohio, U. S. A.

Riveting Machines

Tire Welding Machines

Armature Disc Notching Machines

Tire Bending Rolls

Beam Coping Machines

Bending and Forming Machines

Write for Catalogue if interested. Correspondence invited.

465 Railroad Shops in the United States and Canada Use the Thermit Welding Process



Let us send you this pamphlet.

This comprises practically all the shops of importance in North America, and it can be said without exaggeration that the list of railroads using Thermit includes practically every system from the small road having only three or four locomotives to the largest system in the world having many thousand locomotives.

If by any chance your shop is not using Thermit, you should investigate the process and see how effectively and economically it will handle the many repairs on locomotive frames and other sections.

Remember that the greatest railway systems in the world use hundreds of thousands of pounds of Thermit. They do not use it for any reason except that it "delivers the goods" and has proven itself a profitable investment.

Let us mail you our new pamphlet, No. 2144, which contains full information on the use of Thermit in Railroad Shops.

We have a well equipped shop in Toronto, Ont., for the manufacture of Thermit and appliances used with it.

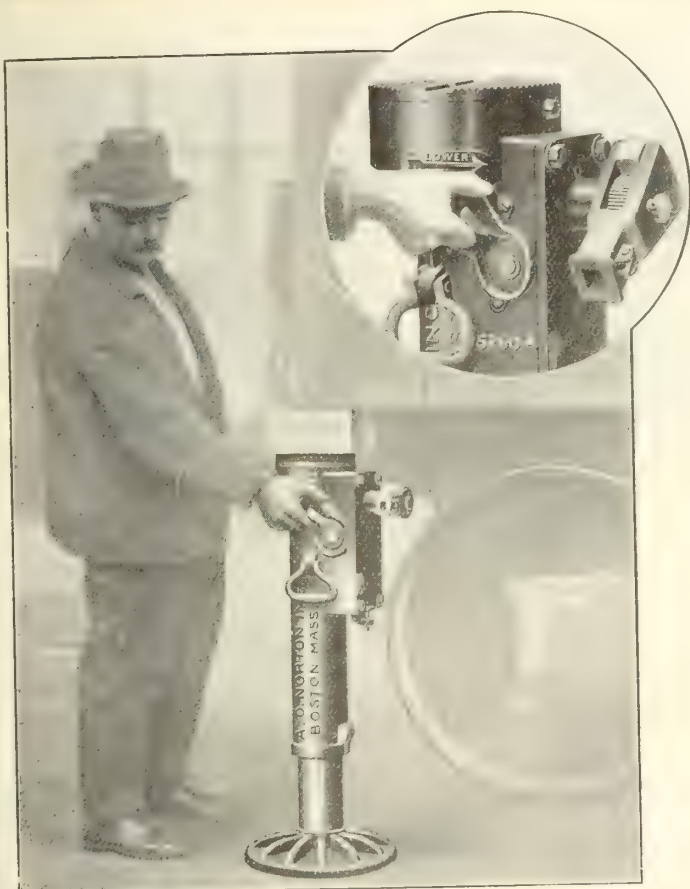
Goldschmidt Thermit Company

103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco

7300 So. Chicago Ave., Chicago

90 West Street, New York



Don't Pump Your Jack Down

Lower the Load by "Pressing the Button"

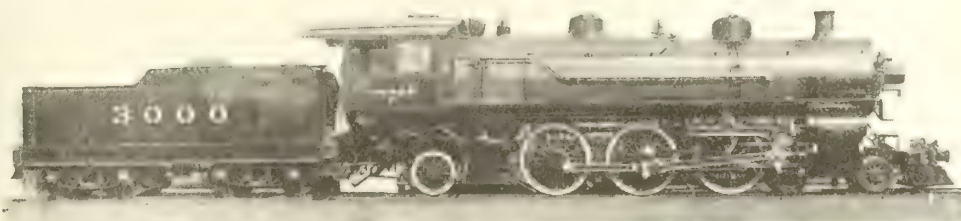
THE NORTON SELF LOWERING JACK

is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

Send for Illustrated Catalogue No. 28

A. O. NORTON, Limited
Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents: **MUSSENS LIMITED**
Montreal Toronto Winnipeg Cobalt Calgary Vancouver



Scientific Treatment of Boiler Waters Dearborn Service to Railroads

Every time an engine failure takes place it means a large expense in dollars to the railroad company in time lost, impairment of service, and cost to send another engine to the rescue. Every time a locomotive goes to shop for repairs, it represents many thousands of dollars invested capital which is earning no revenue.

By the use of Dearborn Treatment engine failures due to the boiler foaming or leaking can be entirely eliminated. Dearborn Treatment counteracts the foaming tendency in waters of that type, and prevents scale formation, and the corrosive and pitting action that results in leaks. By thus overcoming the bad effects of the waters used, and

keeping the boiler tubes and sheets free from incrustation, the engine may be kept in service longer between boiler washings, and the period between shoppings for repairs of this character will be much longer. There are also great savings in fuel and lubricating oil, and the engine will always be in condition to haul full tonnage.

DEARBORN CHEMICAL COMPANY OF CANADA, Limited
Office and Works: 1220-1230 Dundas Street, Toronto, Canada



Pintsch Mantle Light

No other system of car lighting gives clean, safe and efficient light without intricate mechanism, subject to defects and failures. Pintsch Mantle Light is the only absolutely dependable method of lighting railway cars.

The Safety Car Heating and Lighting Company

2 RECTOR STREET, NEW YORK

718 TRANSPORTATION BUILDING, MONTREAL

MODERN HIGH-CLASS

ROLLING STOCK



Passenger, Freight
and
Electric Railway,
Car Castings,
Forgings and Repair
Parts.

CROSSEN CAR COMPANY, LTD.

COBOURG

ONTARIO

HOW RAILROADS SAVE MONEY BY USING THE TATE FLEXIBLE STAYBOLT

TIME HAS DEMONSTRATED

FIRST—That flexible staybolts produce more satisfactory and more economical results than rigid staybolts.

SECOND—That TATE FLEXIBLE STAYBOLTS are best of all, measured by every standard.

Ask for our New Catalog just issued

Manufactured and Sold in Canada by

CANADIAN ALLIS-CHALMERS, Limited, General Offices, TORONTO, ONT.

FLANNERY BOLT COMPANY, - Vanadium Building, Pittsburgh, Pa.

CANADIAN STEEL FOUNDRIES LIMITED

STEEL CASTINGS - MANGANESE STEEL CASTINGS
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK
BAR STEEL

GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
BRANCH OFFICE — TORONTO

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL


The Only Way to be Certain of Permanence



is to specify culverts that cannot deteriorate—that will be in as sound condition when again you think of new tracks or roadbeds as they are when you erect them. Inspect for yourself any of the thousands of

PEDLAR'S PERFECT CULVERTS

in constant use by the best railways and municipalities, under all sorts of strain and climatic conditions, for a number of years, and you'll find them in as perfect condition as when they left our factory.

Pedlar's Perfect  Culverts cannot rust or corrode or crack from frost. The metal used settles that for all time. As for resisting strain or vibration, the corrugations render it 29 times as strong as plain iron pipe of similar gauge.

Keep the fine, complete Culvert Reference Book, No. 4, R.M. always close at hand. It is replete with valuable data and drainage tables you will want to refer to continually. Free to you. Shall we send it to-day?

THE PEDLAR PEOPLE, Limited

(Established 1861)

Executive Office and Factories—**OSHAWA, ONTARIO**

63-A

Branches : Montreal Ottawa Toronto London Winnipeg

STEEL SHIPBUILDERS

Engineers and Boilermakers



Steel Tug "Fredericton" built for the Dominion Government, 80 feet length, 20 feet breadth, 10 feet draught, compound marine engine, 12 x 26 x 18, Clyde boiler 10 feet x 11 feet, 145 lbs. steam.

Dredges, Hydraulic and Dipper
Type; Steel Steamers, full Canal
Size; Tugs, Barges and Scows

*Marine Engines and
Boilers, all Sizes*

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto

Canadian Pacific

When You Travel—Travel In Comfort

"The Canadian Pacific Railway offer to the travelling public service and equipment second to none. They build, own and operate their Compartment Observation Cars, Standard Sleepers, Dining Cars, Coaches and Motive Power."

"The Canadian Pacific own and operate a line of palatial hotels along the Railway from Atlantic to Pacific, thus affording their patrons every possible comfort."

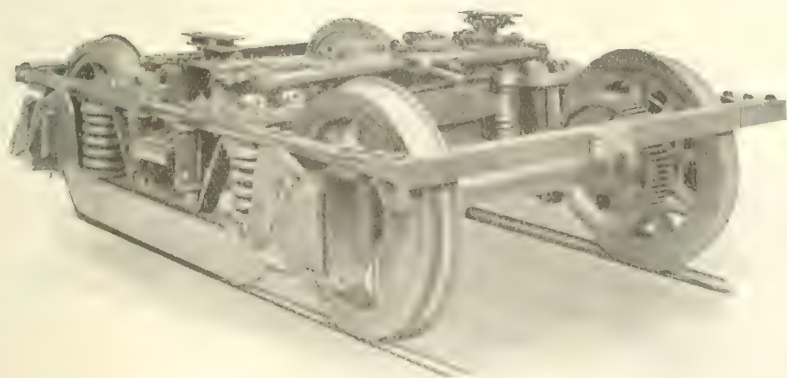
Those contemplating a trip will receive full details and literature on application to any C. P. R. agent, or write

W. FULTON,
Asst. Dist. Pass'r. Agent, Toronto.

M. G. MURPHY,
Dist. Pass'r. Agent, Toronto.

Canadian Baldwin Electric Trucks

INTERURBAN SERVICE



The truck illustrated is designed for high speed on electric railways, and has a rated carrying capacity of 30,000 pounds on the centre plate.

It has frictional side bearings and is of the equalized pedestal type.

Canadian Baldwin trucks, solve the problem of minimum weight, economical maintenance, simple construction, noiseless operation and easy riding.

There is comfort in riding on roads where Canadian Baldwin Trucks are used.

Canadian Baldwin Trucks, Class 84-30-AA, built for Lake Erie and Northern Ry., Ontario.

Manufactured in Canada by

Canadian Locomotive Company, Limited
KINGSTON, ONTARIO

LINKING PRAIRIE WITH OCEAN

Winnipeg
St. John

Cochrane
Halifax

Quebec
Charlottetown

Montreal
The Sydneys

Canadian Government Railways

OPERATE OVER 4,000 MILES OF RAILWAY

Transcontinental Ry.,

Intercolonial Ry.,

Prince Edward Island Ry.,

St. John and Quebec Ry.

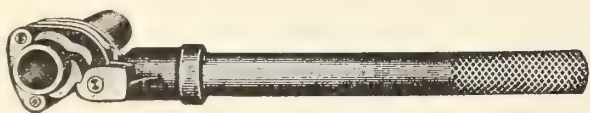
MONTREAL AND HALIFAX—Ocean Limited, Daily, except Saturday—Maritime Express, Daily. Connection for St. John, Prince Edward Island, Newfoundland except Sunday.

THROUGH EXPRESSES

TORONTO AND WINNIPEG—The National (tri-weekly service)—A NEW train via a NEW route through a NEW country.

F. P. GUTELIUS, General Manager. C. A. HAYES, General Traffic Manager. H. H. MELANSON, General Passenger Agent.
Head Offices: MONCTON, N.B.

The Parmelee Pipe Wrench "The Toothless Wonder"



PRICE LIST C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 in.	\$5.00	\$2.25	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 in. \$.75
20 in.	2 $\frac{1}{2}$	$\frac{3}{4}$, 1, 1 $\frac{1}{4}$, 1 $\frac{1}{2}$, 2 in.	7.50	2.50	$\frac{3}{4}$, 1, 1 $\frac{1}{4}$ in. 1.00 1 $\frac{1}{2}$, 2 in. 1.25
25 in.	3 $\frac{1}{2}$	1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3 in.	7.50	3.00	1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3 in. 1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Ltd.

TORONTO, CANADA.

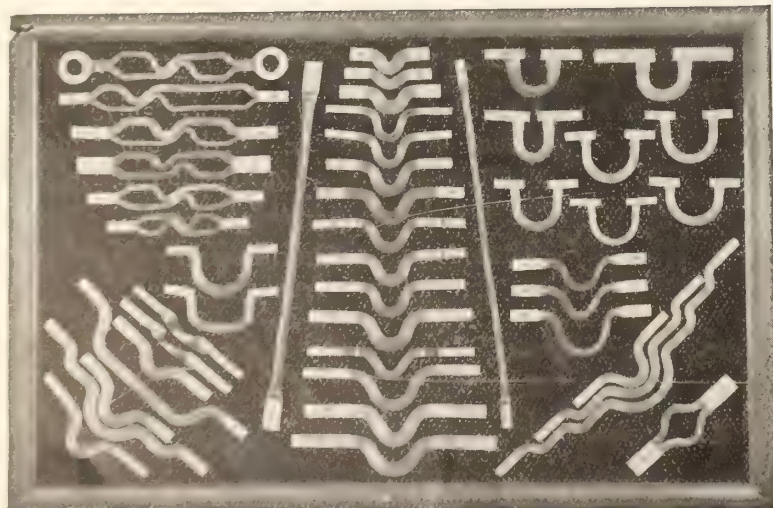
DESIGNED ESPECIALLY to handle pipes spaced closely as in coil work. No. 2 $\frac{1}{2}$ wrench illustrated requires but three-quarter inch space between pipes.

POSITIVE GRIP instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

RATCHET-LIKE ACTION. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

CAN'T CHEW. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

CAN'T CRUSH. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.



Electric Weld Rail Bonds

meet every condition.

Neither do they corrode at the terminals.

The Electric Railway Improvement Co.

Cleveland, Ohio

DOMINION IRON & STEEL CO., Limited

MANUFACTURERS OF

BASIC OPEN HEARTH STEEL RAILS

We will be pleased to have your enquiries for 1916 shipments

HEAD OFFICES
AND WORKS

SYDNEY, CAPE BRETON, CANADA

An Announcement of Special Importance to Signal and Maintenance Men

THE COLUMBIA R.S.A. SIGNAL CELL

TYPE 72



is the latest development in primary batteries for all classes of open circuit or closed circuit work.

This cell is designed to operate satisfactorily under all service conditions. It has a high ampere capacity that is not affected by severity of weather conditions.

It is simple, yet very rugged in construction, and a minimum amount of labor is necessary in setting up this cell.

The copper oxide element is made of loose, flaky material contained in a perforated holder. This insures free circulation of the solution and constant internal resistance.

The cell is self oiling—it does not require the addition of any oil.

It is being successfully used by over 30 railroads in Canada and the United States.

We want to send you detailed information. Will you write for it?

CANADIAN NATIONAL CARBON COMPANY, Limited
99 Paton Road TORONTO, ONTARIO

Algoma Steel Corporation, Limited

Manufacturers of

Steel Rails, Splice Bars, Tie Plates, Forging Billets, etc.

We would be pleased to have your enquiries for 1916 deliveries.

Works and Sales Department: Sault Ste. Marie, Ontario, Canada

DROP FORGINGS

Made in the Champion Way

Also Steam Hammer and Heading Machine Forgings

Let us have your Blue Prints

THE CHAMPION MACHINE & FORGING COMPANY CLEVELAND, OHIO

New York Office:
30 Church St.

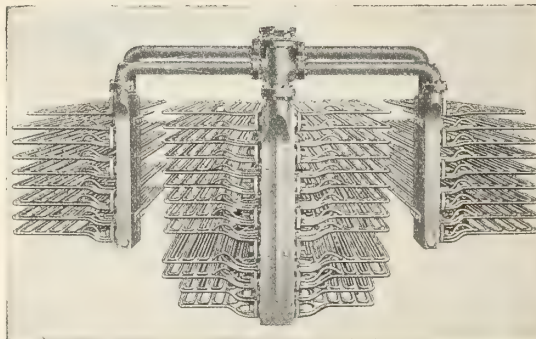
Philadelphia Office:
Bourse Building.

Detroit Office:
H. B. Kendal,
56 Cadillac Sq.

Chicago Office:
1623 Monadnock Block.

Fire Tube Marine Superheater--Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler horse power from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 CHURCH ST., NEW YORK, N.Y.

PEOPLES GAS BLDG., CHICAGO, ILL.

JAS. W. PYKE & COMPANY, LIMITED IRON, STEEL AND METAL MERCHANTS

LOCOMOTIVE, DRIVING, ENGINE AND TENDER TRUCK AXLES, PASSENGER, FREIGHT, AND ELECTRIC TRAM CAR AXLES—To Standard or Railway's own Specification.
STAYBOLT AND ENGINE BOLT IRON—Quality and Service Unexcelled.
STEEL PLATES—Firebox, Flange and Tank Qualities.
STRUCTURAL SHAPES—Beams, Channels, Angles, Tees, Zees, etc.
STEEL BILLETS & FORGINGS—of all descriptions.
LOCOMOTIVE BOILER AND SUPER HEATER TUBES—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
232 ST. JAMES STREET,

MONTREAL

The Light of Day on the Right of Way

HEADLIGHTS

Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

CAR LIGHTING

Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency and economy. Standard cylinder supplies from one to two months' lighting of the average car.

SIGNALS

Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

Commercial Acetylene Railway Light and Signal Company

103 BAY STREET, TORONTO

Main Office 80 Broadway, New York

Branches: Atlanta, Boston, Chicago, San Francisco



Car Bolster Spring with Pressed Steel Caps

RAILWAY SPRINGS

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.

EQUALIZING, DRAWBOARD, BUFFER AND SPIRAL SPRINGS of all kinds.

STREET RAILWAY SPRINGS, from the largest to the smallest.

TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE SANDERS, CHAIN, Etc.

MANUFACTURED BY

B. J. COGHLIN COMPANY, LIMITED

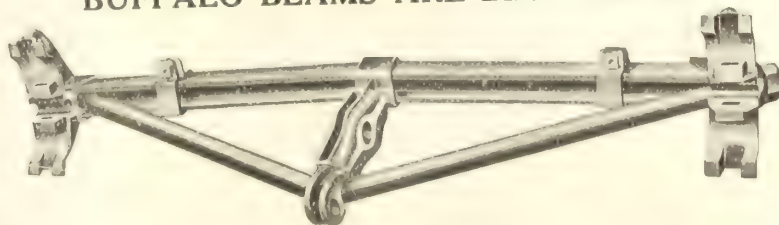
MONTREAL - - CANADA

Buffalo Brake Beam Company

BUFFALO BEAMS ARE BEST BEAMS

OFFICES:

NEW YORK
30 Pine Street
ST. LOUIS
Syndicate Trust Bldg.
MONTREAL
195 Commissioner St.



WORKS:

Buffalo, New York

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment



MILLING CUTTERS

TAPS — DIES — REAMERS — DRILLS

MADE
IN
CANADA

=BUT=

SOLD
ON
MERIT

Pratt & Whitney Co. of Canada, Ltd.
DUNDAS, ONTARIO

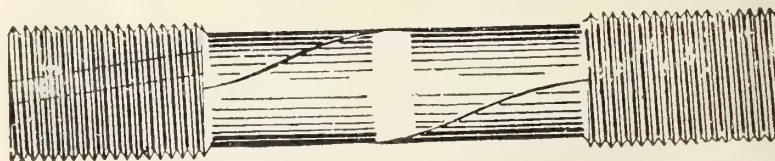
MONTREAL

VANCOUVER

WINNIPEG

American Flexible Staybolts

Manufactured in Montreal



Made of the best standard staybolt iron, adding flexibility by process of making as shown above--closely approximating a rope structure.

Write for booklet on subject.

TAYLOR & ARNOLD, Limited
MONTREAL WINNIPEG

Thor

Reversible, Pneumatic, Wood-Boring Machines

Size AW boring holes $3\frac{1}{4}$ " in diameter for car floor washers. Maximum capacity 4". Equipped with Corliss valves, roller bearings and one piece connecting rods. Economical and reliable. Especially adapted for marine work. Free trial.

Ask for Circular W Showing Complete Line

Independent Pneumatic Tool Company

334 St. James St., Montreal, Que.

W. H. Rosevear & Son, Winnipeg, Man.



February, 1916.]

ENAMELED IRON SIGNS

The ideal signs for
Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.

We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc.

Guaranteed not to
fade or be affected
by the weather in
any way.

Acton Burrows
Limited

Enameled Iron Signs

70 Bond Street - Toronto

DOMINION BRIDGE COMPANY, LIMITED

Head Office and Works,
MONTREAL, P.Q.

Branch Offices and Works,
TORONTO, OTTAWA AND WINNIPEG.



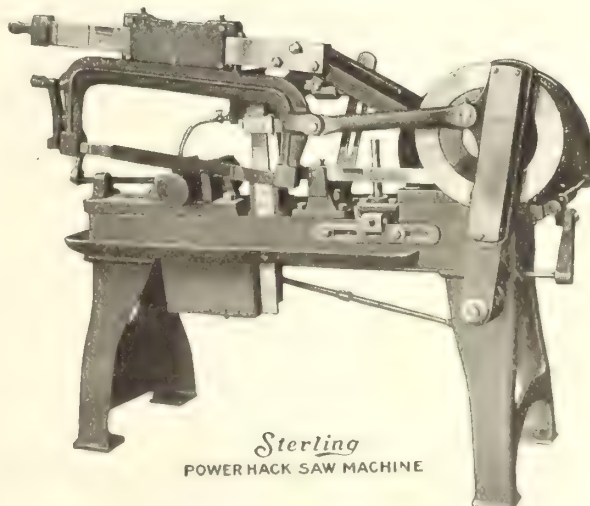
Lachine Bridge.

Engineers, Manufacturers and Erectors of Steel Structures.
CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

LARGE STOCK OF STANDARD STRUCTURAL MATERIAL AT ALL WORKS.

"STERLING" High Duty Power Hack Saw Machine



Sterling
POWER HACK SAW MACHINE

Cuts round material up to and including 6 in.

Manufactured by

DIAMOND SAW & STAMPING WORKS,
BUFFALO, N.Y., U.S.A.



28 "Service" Branches Throughout Canada

CANADIAN CONSOLIDATED
RUBBER CO., LIMITED
MONTREAL, P. Q.



"The Higher Cost of Paying Less"

There are two costs to every article—*purchase* cost and *service* cost. One gives you ownership. The other gives you results.

And an article is of value only in proportion to its ability to give *Service*.

This applies to rubber goods, as well as to all other merchandise.

Our line-up is complete, our quality is unexcelled, and our prices are right. Let us show you what we can do.

IT IS OUR DESIRE TO SERVE YOU



CANADIAN CONSOLIDATED
RUBBER CO., LIMITED
MONTREAL, P. Q.

28 "Service" Branches Throughout Canada



Canadian Railway and Marine World

February, 1916.

Standard Lettering of Freight Cars.

Certain definite regulations regarding the marking to be used for freight cars were made by the Master Car Builders' Association in a report presented at its convention in 1905. This report covered the style of letters and figures to be used, so that uniform stencils might be prepared and used on all freight cars, and, secondly, uniform height of letters and figures for specified

truck as the lettering will permit, preferably to the left of the centre line on side of car.

Various refinements in detail of marking freight cars have been carried out year by year, but several serious objections were not eliminated. As the matter developed, the American Railway Association issued circular to all owners of freight equipment on May 18, 1910, and Nov. 20, 1912, in reference

latter retains the old marking without infringement. Each road acknowledges its official reporting marks by having them appear on all of its freight cars.

The standard marking jointly agreed to by the Master Car Builders' and American Railway Associations is shown by the accompanying drawing, fig. 1, which is reproduced from the Railway Age Gazette. Fig.

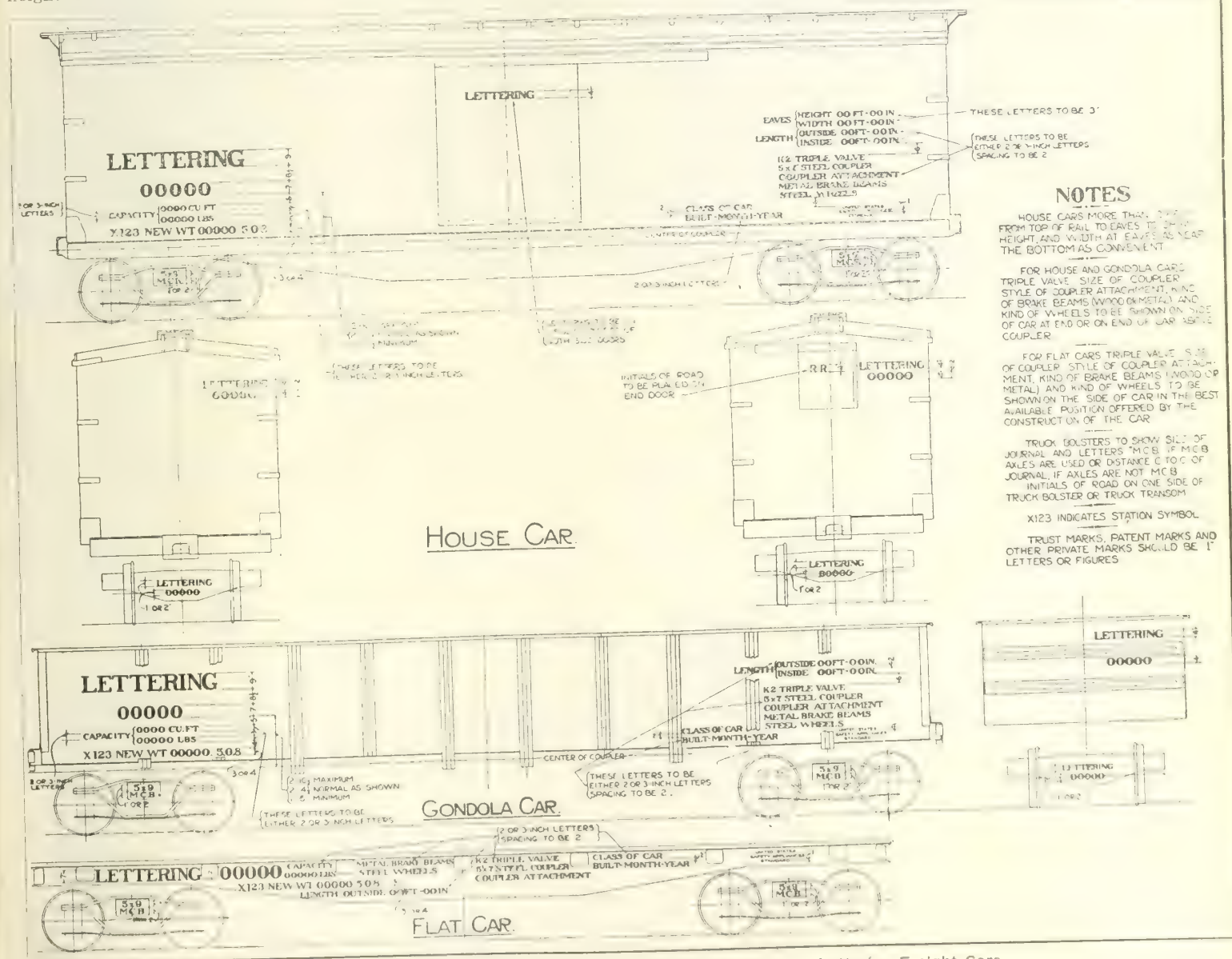


Fig. 1.—Master Car Builders' Association Recommended Practice for Lettering Freight Cars.

markings, so that in a general way these markings would be standard for all freight equipment cars. No particular location was recommended at that time, as to where the various markings were to be placed, allowing each ownership to use its own judgment in the matter to a certain extent. At the 1909 convention, it was decided to have the markings on sides of cars, wherever possible, carried out in the following order: 1. Lettering (initials or name of road); 2. Number; 3. Capacity; 4. Light Weight. This marking to be located as nearly over the

to the uniform marking of freight cars, and immediately following this a suitable list of official reporting marks was prepared covering each identical road or private owner and arranged in such a way that there could be no possible ground for confliction, as was the case under the old scheme, where perhaps two or more roads persisted in using the same marking. For instance, the Intercolonial Ry. and the Illinois Central Rd., both used the reporting mark "I.C.R." for a long time and under the new system, "I.R.C." applies to the first road and the

2 shows a C.P.R. car with the new standard lettering.

Following are the official reporting marks for roads operating in Canada:

Algoma Central & Hudson Bay	A.C. & H.
Algoma Eastern (See Algoma Central & Hudson Bay)	
Bay of Quinte	B.Q.
Brookville, Westport & North-Western	B.W.N.
Canada & Gulf Terminal	C.G.T.
Canadian Government	C.G.
Canadian Northern	C.N.
Canadian Northern (Quebec)	C.N.Q.
Canadian Northern Quebec	C.N.Q.
Canadian Pacific	C.P.
Cape Breton	C.B.N.

Caraguet & Gulf Shore	C. & G.S.
Carillon & Grenville	C. & G.V.
Central Ontario	C.O.T.
Central Vermont	C.V.T.
Chatham, Wallaceburg & Lake Erie ..	C.W. & E.
Cumberland Railway & Coal Co.	C.D. & C.
Delaware & Hudson	D. & H.
Dominion Atlantic	D.A.
Duluth, Winnipeg & Pacific	D.W. & P.
Elgin & Havelock	E. & H.
Eastern British Columbia	E.B.C.
Esquimalt & Nanaimo	E.Q. & N.
Essex Terminal	E.T.L.

National Transcontinental.
 Prince Edward Island.
 St. Lawrence & Adirondack.
 Vancouver, Victoria & Eastern.
 Wellington Colliery.

The C.P.R. solicits its shareholders' business.—C.P.R. shareholders received with their dividend cheques recently a printed slip reading as follows:—"Take this cheque not merely as a dividend on so much money

Tank Car for Fire Fighting on National Transcontinental Railway.

A tank car which has been equipped recently at the Canadian Government Railways shops at Moncton, N.B., for fire fighting on the N.T.R. between Edmundston, N.B., and Quebec, is illustrated herewith. A rec-

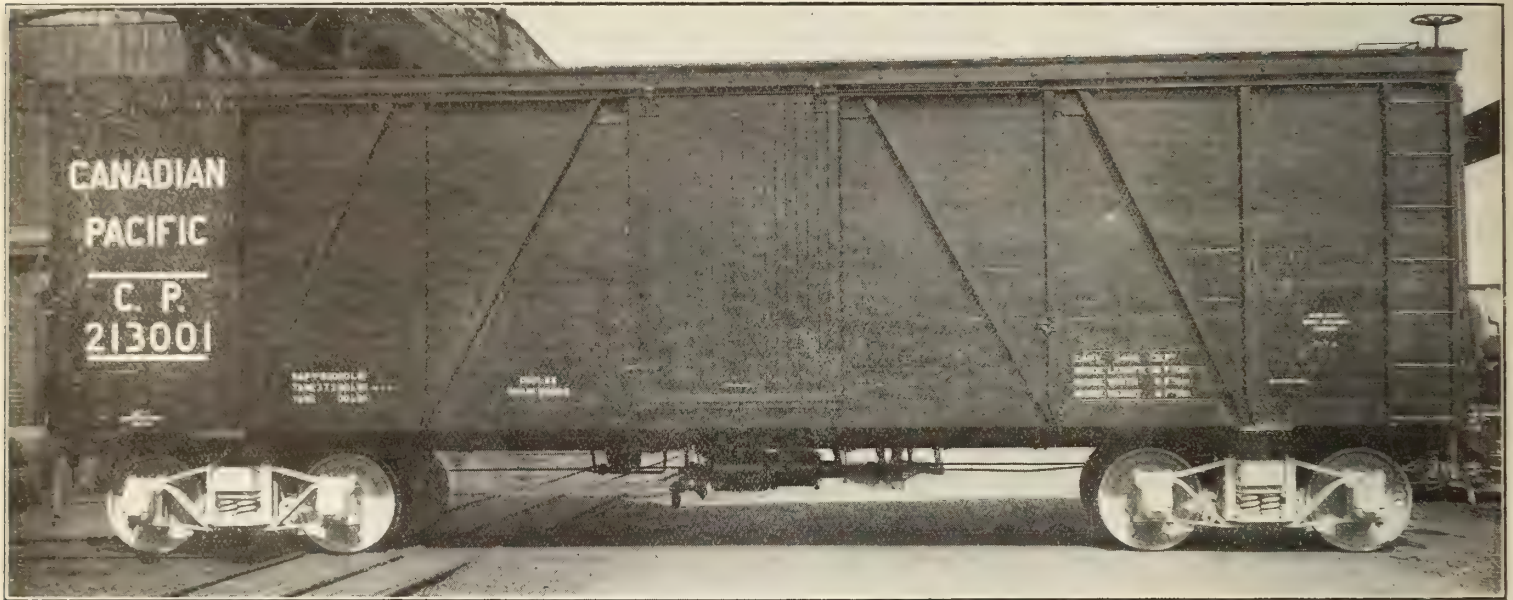


Fig. 2.—Canadian Pacific Railway Lettering for Wooden Frame Box Cars.

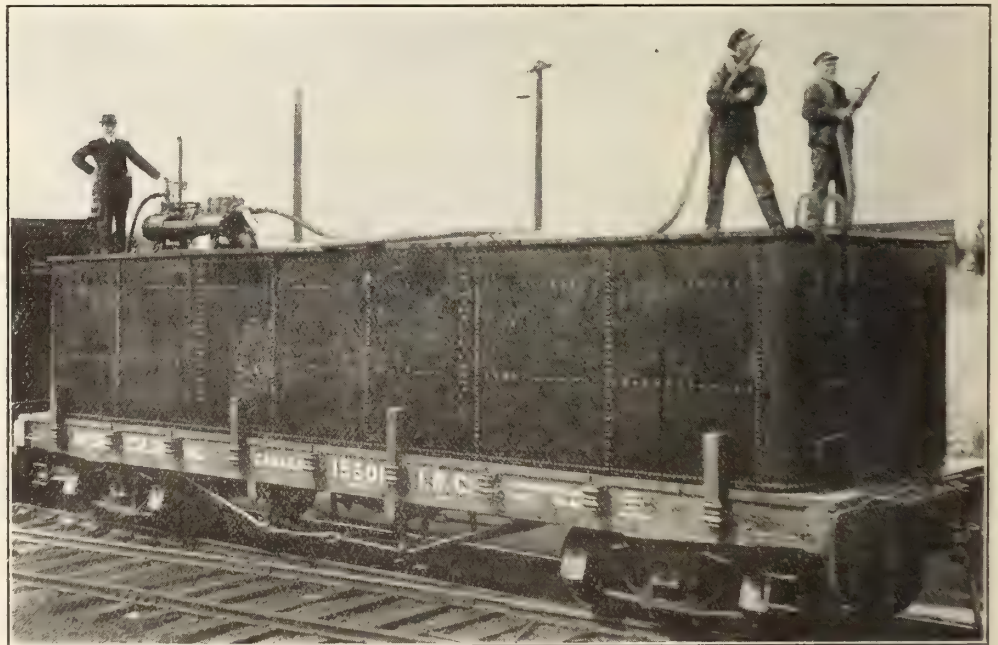
Galt, Preston & Hespeler	G.P. & H.
Grand Trunk	G.T.
Grand Trunk Pacific	G.T.P.
Great Northern	G.N.
Halifax & Southwestern	H. & S.W.
Intercolonial	I.R.C.
Inverness Railway & Coal Co.	I.V. & C.
Irondale, Bancroft & Ottawa	I.B. & O.
Kent Northern	K.N.
Kettle Valley	K.V.
Lotbiniere & Megantic	L. & M.G.
Maine Central	M.E.C.
Michigan Central	M.C.
Midland of Manitoba	M.O.M.
Minneapolis, St. Paul & Sault Ste. Marie ..	S.O.O.
Moncton & Buctouche	M. & B.U.
Montreal & Southern Counties	M.T. & S.
Morrissey, Fernie & Michel	M.F. & M.
New Brunswick & Prince Edward Island ..	N.B. & P.
New Brunswick Coal & Ry. Co.	N.B.C.
New York & Ottawa	N.Y. & O.
Niagara Junction	N.J.
Niagara, St. Catharines & Toronto ..	N.S. & T.
North Shore (New Brunswick)	N.S.N.
Northern New Brunswick & Seaboard ..	N.N. & S.
Northern Pacific	N.P.
Oshawa	O.S.H.
Pacific Great Eastern	P.G.E.
Pere Marquette	P.M.
Phillipsburg Ry. & Quarry Co.	P.R. & Q.
Quebec & Lake St. John	Q. & L.S.
Quebec Central	Q.C.
Quebec, Montreal & Southern	Q.M. & S.
Quebec Oriental	Q.O.
Quebec Ry., Light & Power Co.	Q.L. & P.
Roberval-Saguenay	R.S.
St. Clair Terminal	R.U.T.
St. Martins	S.C.T.
Salisbury & Albert	S.M.
Schomberg & Aurora	S. & A.
Sydney & Louisburg	S. & A.U.
Temiscouata	S. & L.
Thousand Islands	T.M.C.
Timiskaming & Northern Ontario ..	T.T.I.
Toronto & York Radial	T.M. & N.
Toronto, Hamilton & Buffalo	T. & Y.R.
Victoria & Sidney	T.H. & B.
Victoria Terminal Ry. & Fy. Co.	V.T. & S.
Wabash	V.T. & F.
York & Carleton	W.A.B.
	Y. & C.

The following lines have not had any markings assigned to them:

Atlantic, Quebec & Western.
 Bedlington & Nelson.
 Brandon, Saskatchewan & Hudson Bay.
 British Yukon.
 Crows Nest Southern.
 Fredericton & Grand Lake Coal & Railway Co.
 Klondike Mines.
 London & Port Stanley.
 Maritime Coal, Railway & Power Co.

invested, but as a reminder of your personal interest in the prosperity of Canada and the C.P.R. Co. Your dividends come from our traffic, which you can always assist by travel over our system, shipping goods by our route, using our telegraphs, steamers, or hotels. If you are unable per-

tangular tank of 10,000 gallons capacity that had been used as a temporary tank at water stations, was placed on a flat car and the top planked over and a double acting pump placed on top of it, with a steam connection arranged so that a connection could be made to the standard steam hose coupling of a



Tank Car for Fire Fighting on National Transcontinental Railway.

sonally to use our services, talk about Canada and the C.P.R. to your friends. Rest assured there is no finer scenery, no better sport, no greater comfort in travel, no more careful handling of freight and express, no prompter service in any part of the world than is found along the line of the Canadian Pacific."

locomotive. The pump is equipped with a Siamese coupling and will throw two good sized streams of water about 200 ft.

The Dominion Ex. Co. has opened offices at Humphreys Mills, N.B., Redwater, Ont., Secretan, Sask., Compeer, Spring Coulee and Travers, Alta., and Tappen, B.C.

February, 1916.]

Railway Companies Collection of Cartage Tolls Considered by Board of Railway Commissioners.

Sir Henry L. Drayton, Chief Commissioner, Board of Railway Commissioners, gave the following decision Nov. 22, which was concurred in by the other commissioners:—

Several complaints have been made as to the practice of railway companies in collecting cartage tolls from consignees. The complaints are complaints really made by the consignees against the consignors, as the collection of cartage charges, which from time to time are disputed, are invariably charges which the consignor has instructed the railway company to collect from the consignee. The railway makes no profit out of the transaction, and it is a matter of indifference to it whether it collects from the consignee the cartage charges which have been charged against the railway by the cartage company, or whether the consignor pays them in the first instance.

It is perfectly clear that cartage is not covered under the maximum toll which railways may collect for the service of transportation as contemplated by the act. By this I mean it is not included in any filed tariff applicable to the line haul. It is entirely a separate and distinct matter, and has nothing to do with the factors making up the railway transportation rates as popularly and properly understood. Some of the English acts make the point perfectly clear. The London, Brighton, and South Coast Ry. Act, 26-27 Vic., chap. 218, sec. 51, provides that the maximum rate of charges to be made by the company for the conveyance of animals and goods shall not exceed certain sums prescribed, and especially excepts a reasonable sum for, among other things, delivery and collection. In the case of *Sowerby vs. G.N. Ry.*, 60 L.J., Q.B. 467; 65 L.T. 546, C.A., it is expressly held that a railway performing a cartage service is entitled to be paid for it.

The Board has dealt with the matter similarly. The considered judgment of the Assistant Chief Commissioner will be found in *Stewart vs. C.P.R. Co.*, 11 C.R.C. 197. In that case, the charge had been made for carting a marble slab to the railway company's freight sheds from the consignor's premises. The cartage was included in the railway company's freight bill and paid by the consignee at Hamilton. On it appearing that the company's cartage tariff, which had been approved by the Board, did not include a charge for carting marble slabs in Montreal, but, as pointed out in the judgment, expressly excluded marble slabs, the charge was disallowed, on the ground that it was a charge collected as a toll within the meaning of the railway act not appearing in a tariff, a practice prohibited by sec. 314, ss. 5.

The act itself contemplates charges for cartage. The amendment of 1908 substitutes a new section for sec. 2, ss. 30. This subsection, defining the word "toll" or "rate," specifically includes charges for cartage. Railway companies have since filed proper and appropriate tariffs for cartage service. The practice which has been followed for years has in effect been that the railway companies have advanced cartage charges on outward shipments to the cartage companies, and have included in their freight bills under the caption of "Cartage charges" the amount advanced.

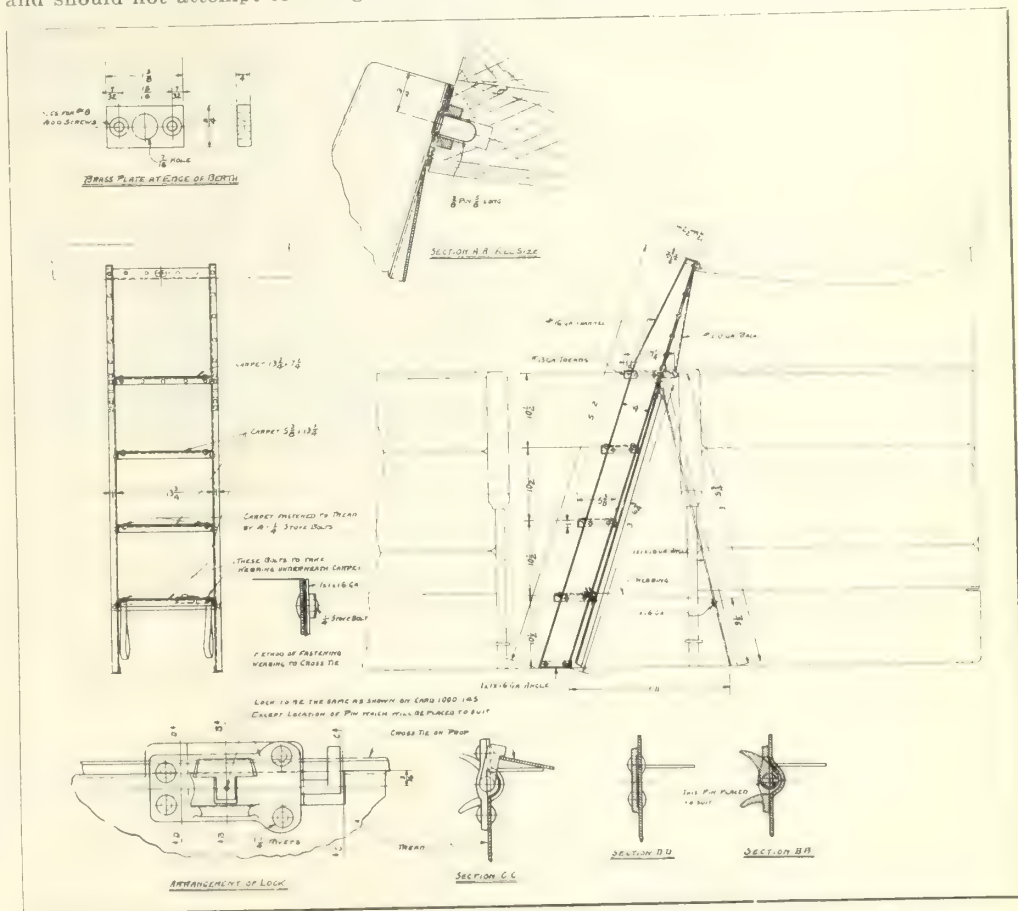
In Aug., 1913, the railway companies proposed to cancel all cartage tariffs, as they desired to discontinue contracts which they had made with the cartage companies. The railway companies urged that they had, in the past, been absorbing part of the charge; and that the service was not a railway service, but one which had been given in ease

of the general situation and for the convenience of the public. Strong protests were made against the proposal. It was reconsidered by the railways; and, at the request of the shippers, the practice was continued under a somewhat higher tariff. The shippers alleged that it would cost much more if the shippers had to have the service performed by independent carters, and that much confusion and inevitable delays would result, if the previous system was abandoned. At that time, as now, the consignees objected to be charged with the cartage rate. The position taken by the Board at that time was that it had not the power and should not attempt to change or modify

has but to deduct the sum collected for cartage, if improperly collected from him, from his invoice. The case is just the same as if the consignor, in a case where the contract called for free delivery at destination, had forwarded the shipment with freight charges collect. In each instance, the question as to whether the freight charges or the cartage charges should be paid by the consignor or the consignee depends on the terms of the contract, to which the railway company is not a party and has no means of ascertaining the facts.

Steel Step Ladder for Canadian Northern Railway Sleeping Cars.

The Canadian Northern Ry. mechanical department has developed an all steel berth step ladder for use on its sleeping cars that



Steel Step Ladder for Canadian Northern Ry. Sleeping Cars.

in any way the rights and obligations of the contracting parties; that the question as to whether the consignees should or should not pay cartage was a matter entirely of contract between the consignors and the consignees, that the Board had nothing to do with the question; and that the work of cartage was not a railway service or facility within the meaning of the act, although covered by the definition of "toll."

In case where the purchase is f.o.b. cars at shipping point, instead of at the warehouse, there is no doubt that the consignees should not have to pay the cost which should be borne by the consignor; but this question is not, however, in any sense, a question for the Board. Generally speaking, the railway company is bound by the consignor's instructions. If these instructions include the collection of the cartage charges, in addition to the collection of the freight charges, there is no reason why the railway company under the act cannot hold delivery of freight until payment is made.

The consignee's remedy is simple, as he

has many advantages from the point of view of construction and convenience over the usual wooden ladder which is placed in the centre of the aisle. The side member consists of 1 1/2 lb. galvanized iron channel, 13 3/4 ins. back to back, with 13 lb. galvanized iron treads, 10 1/2 ins. rise. At the back there is a hinged support of 1 x 1 in. 16 galvanized iron angles, with 1 in. webbing to keep the legs from spreading too far. The top of the ladder has tips which fit into sockets in the upper berth face. Above the top step of the ladder, the back is closed in by 20 lb. galvanized iron sheeting, which will be appreciated especially by women in mounting to an upper berth. When not in use the ladder will fold up neatly in the porter's cupboard at the end of the car.

The Great North Western Telegraph Co. has opened an office at La Tuque, Que., and has closed its offices at Capucins and Little Metis lighthouse, Que., and Badger, Berton, Lorette, Neelin and Vista, Man.

Steel Suburban Cars, Grand Trunk Railway.

The G. T. R. has in service 15 steel frame suburban cars, which are the first steel passenger cars used by the company, and embody some interesting features of design. The steel body framing of the cars, an interior view and a detail view of the underframing are shown in the accompanying three illustrations.

The underframing is of the fish belly girder type, with a carrying side girder plate. The fish belly centre sill consists of two 5-16 in. web plates, 18 ins. apart, 26 ins. deep through the central 28½ ft., tapering to a depth of 16 ins. at the body bolster casting. The top edges of these web plates are reinforced with 5 x 3 x ¾ in. angles on each side of each web, and the bottom, with 3 x 3 x ¾ in. angles on each side of each web, the whole covered with a 30 x ¾ in. cover plate, extending the full length of the car. The body bolster is a heavy steel casting, while the 3 cross bearers, located at the centre and 14¼ ft. each side of the centre, are of flanged ¾ in. plates. The side sills of the cars consist of 5 in. 11.6 lb. Z bar sections, extending the length of the car, between the inner flange of which and the cover plate, there is 1-16 in. floor plating. From the web of the Z bar there is a ¼ in. side sheet plate, extending up to the window sills, reinforced along the inner edge at the top by a 1½ x 4 x 7-16 in. dropper bar. The underframing is further reinforced by flanged sheet stiffeners.

The centre sills are carried through to the bumpers. From the bumper sill back as far as the body bolster casting, there is on each side of the centre sill a 7 in. channel member. The upper rail of the side frame is a 3½ x 3½ x ¾ in. angle, carried on vertical angles between the windows. The bulkhead framing consists of six vertical 4 in. 8.2 lbs. Z bars, with a 4 x 3 x 5-16 in. angle across the top for top rail. The vestibule framing consists of pressed section corner posts, with 2 intermediate 8 in. I beams, with 3½ x 3½ x ¾ in. angle across

with standard 13-16 in. siding. The roof is carried on one piece carlines, forming decking of the standard section.

The cars have an overall length of 82 ft. 10½ ins., 70 ft. long over the body. The interior finish is in mahogany, and the seats



Interior of Steel Suburban Cars, G.T.R.

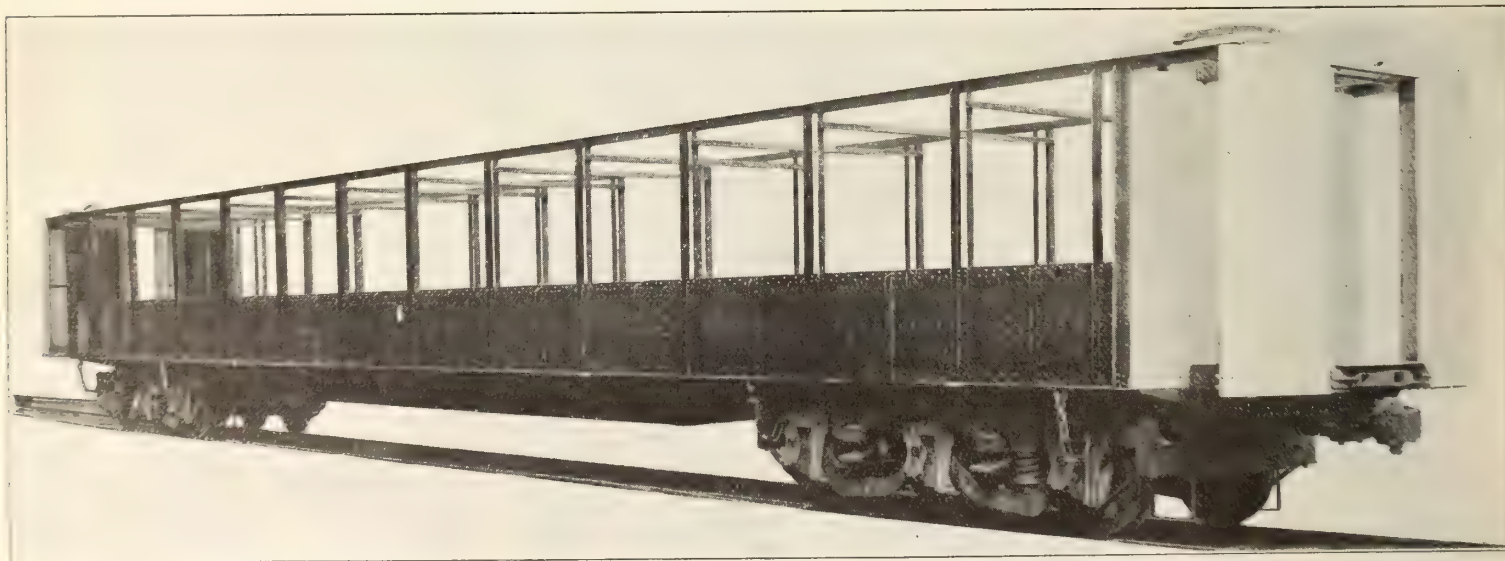
are of rattan. They are electrically lighted, and have the vapor system of steam heat. We are indebted to J. Coleman, Superintendent Car Department, G. T. R., for the data on which this article is based.

A detail view of the underframing of these cars appears on the next page.

Was a Pioneer Tunnel Advisable at Rogers Pass?

One way of doing a thing well is to do it twice. Ordinarily this is an uneconomical procedure, but the builders of the Rogers Pass tunnel claim that it is economical in their case. They had a long tunnel to dig, and so they started by excavating a second tunnel, a useless tunnel, first, and from it they proceeded to attack the main tunnel itself. To describe the striking, iconoclastic method of the "pioneer heading" in the above terms is likely to seem belittling and unfair. The work was carried on in highly successful and expeditious style. Record breaking rates of advance were made, greater at least than any prior performance on the western continent. No untoward incidents interfered with smooth progress. So the work merits congratulations and praise. That fact, however, does not bar the question whether the second tunnel scheme was an essential factor, or whether the same or even better results would have been attained without it.

Comparison with the Simplon tunnel is invited, because there the parallel heading method was also used—in fact it was originated by the Simplon engineers. Two reasons in co-operation made a sound basis for the method there: First, the prospects were that great heat and large waterflows would be encountered, which would call for drainage and ventilation capacity almost impossible to secure in a single heading; and second, if for purposes of ventilation and drainage a second heading were driven along with the main heading, it could be used later for the second tunnel which would shortly be needed to provide double track, and so the parallel expense would involve hardly any dead expense. There has been much difference of opinion in Switzerland among tunneling experts as to whether the Simplon experience justifies the existence of the parallel tunnel method of construction. In the later Loetschberg tunnel, which is shorter than the Simplon but still much



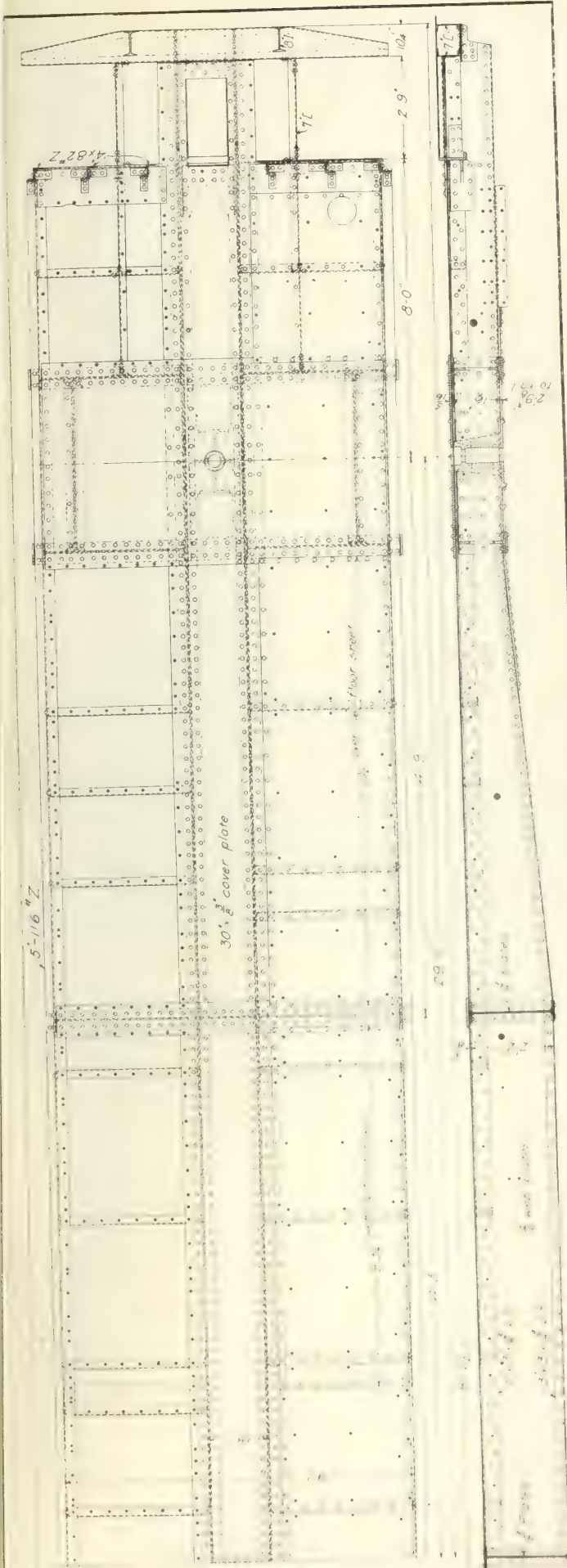
Steel Suburban Car, Grand Trunk Railway, During Construction, Showing Arrangement of Steel Members.

the top, and two 7 in. channels for bumper sill across the bottom.

The flooring consists of two ¾ in. layers of non-conducting material, one above and the other below the 1-16 in. plate flooring, above which there are two layers of ¾ in. flooring, the under one laid diagonally. The siding consists of a ¾ in. layer of non-conductor, with 1½ in. horizontal boarding, sheathed

Port Mann Town Site.—The Pacific Properties, Limited, started proceedings in a British Columbia court, Jan. 7, to recover damages, estimated at \$1,500,000, from the Canadian Northern Ry. The plaintiffs claim that this money was expended on the Port Mann town site on the understanding that it was to be the C.N.P.R. Pacific coast terminus.

longer than the Rogers Pass, the method was not used; and although this is a double track tunnel there is no ground for assuming that the greater width had anything to do with the selection of the driving method. The conclusion is probably conservative that for the Simplon itself the parallel tunnel method was a vitally important device, making possible the suc-



Underframing of Steel Suburban Cars, Grand Trunk Railway.

pears, for if it were the pioneer headings would have been driven on an up slope, to drain. Ventilation, however, may have had important bearing, and a clear statement of how much account was taken of ventilation in adopting the tunneling method will be a most desirable thing.—Engineering News.

Order re Joint Freight Rates and Concurrence Notices.

Sir Henry L. Drayton, Chief Commissioner, Board of Railway Commissioners, gave the following decision Dec. 14:—
The Chief Commissioner reports that the Canadian Pacific and the Grand Trunk Pacific Railway Companies have filed with the Board a revocation of the concurrences of the respective railway companies which were filed with the Board, and the effect of which was to concur in joint tariffs issued by the Canadian Northern Railway lines (West Fort, Ont., and east thereof), lines (Port Arthur, Ont., and west thereof). The Canadian Northern has retaliated by revoking its concurrence in joint tariffs issued either by the Canadian Pacific or the Grand Trunk Pacific. The notifications differ in form. That of the Grand Trunk Pacific in terms revokes the concurrence filed, and states that future concurrences in favor of

the Canadian Northern will be covered by specific concurrence notices. The Canadian Pacific simply cancels its concurrence and says nothing as to what stand it takes in so far as future concurrences are concerned.

Under the act, joint rates are obligatory; and while all the railways concerned seem at least to agree in an effort to get rid of them, as they are all filing revocation of concurrences, joint rates were not called for by the act in ease of railway companies, but in ease of the general freight movement and cost to the public. The companies cannot be permitted to destroy the system of joint rates, simply because they so desire. Under the act, as I at any rate read it, no joint tariff can be disregarded by the companies until it has been superseded or disallowed by the Board. While it well may be that the Board is not now immediately concerned as to the proposal of the Grand Trunk Pacific that concurrences in joint rates will be expressed in the future by concurrence of the individual tariff instead of by the general form which the companies file, the Board is concerned in seeing that concurrences are not revoked, in so far as joint rates effective by reason of such concurrences given in the past are concerned.

So as to give full effect to the revocation of concurrences already alluded to, the Canadian Pacific has in addition filed Supplements nos. 9 to C.R.C. no. E, 284; 29 to C.R.C. no. E, 284; 2 to C.R.C. no. E, 284; 2 to C.R.C. no. E, 284;

3 to C.R.C. no. E, 289; 1 to C.R.C. no. E, 289; 1 to C.R.C. no. E, 307; and other tariffs under these supplements specified. The above tariffs directly cancel joint tariffs as therein set out. The revocation notices given by the different companies, and the supplements issued to tariffs by the Canadian Pacific as above set out, are all cancelled and disallowed. If the companies desire relief in connection with any particular provision of the act, and, so far as joint rate now in effect, the only possible way they can get that relief is by following the provisions of the act, making out a case justifying the extension of such relief.

The following order, 24588, was issued Dec. 22:—Upon its appearing that the Canadian Pacific, the Grand Trunk Pacific, the Esquimalt & Nanaimo, and the Canadian Northern Railway Companies have filed with the Board certain notices of revocation of general notices of concurrence in joint freight rates between points on the railways of the respective companies and previously filed with the Board, the said notices of revocation being as follows:

Canadian Pacific.—G. C. no. W-60 in favor of Canadian Northern (East); G. C. no. W-61 in favor of Canadian Northern (West).
Grand Trunk Pacific.—G. C. no. A-4 in favor of Canadian Northern.
Esquimalt and Nanaimo.—G. C. no. 7 in favor of Canadian Northern; G. C. no. 55 in favor of Canadian Northern (East).
Canadian Northern Railway (West).

G. C. no. 1 in favor of Canadian Pacific (West); G. C. no. 4 in favor of Grand Trunk Pacific.

Canadian Northern Railway (East).—G. C. no. E-153 in favor of Canadian Pacific (East); G. C. no. E-154 in favor of Canadian Pacific (West).

It is ordered that, under the authority of sections 323 and 338 of the Railway Act, and of the general powers possessed by the Board in that behalf, the said notices of revocation, in so far as they affect joint rates previously published and filed, be disallowed, leave being reserved to the said companies to proceed in accordance with clause 6 of General Order 146, dated July 7, 1915. And

it is also ordered that the following schedules filed with the Board, purporting to withdraw and cancel the joint tariffs to which they refer, be disallowed, viz.:—supplements no. 9 to C.P.R. Tariff, C.R.C. no. E-2841; no. 29 to C.P.R. Tariff, C.R.C. no. E-2843; no. 2 to C.P.R. Tariff, C.R.C. no. E-2894; no. 3 to C.P.R. Tariff, C.R.C. no. E-2895; no. 1 to C.P.R. Tariff, C.R.C. no. E-2896; no. 1 to C.P.R. Tariff, C.R.C. no. E-3079.

No. 9 to Canadian Northern Tariff, C.R.C. no. W-791; no. 2 to C.N.R. Tariff, C.R.C. no. E-563; no. 3 to C.N.R. Tariff, C.R.C. no. E-568 no. 1 to C.N.R. Tariff, C.R.C. no. E-569; no. 1 to C.N.R. Tariff, C.R.C., no. E-709.

Making a Fill on the Canadian Northern Railway From a Pontoon Bridge.

About half way between Winnipeg and Port Arthur it was found desirable to locate the C. N. R. main line across an arm of Rainy Lake. It was decided to make a rockfill for the crossing, which was 3 miles long, and in order to avoid the necessity of driving piles to support the work trains a special pontoon arrangement was devised. Surveys for determining the nature of the permanent construction were started in 1908, and it was found that the depth to

used in starting fills out from their shores. In Oct., 1910, two model C 95 ton Bucyrus steam shovels were put to work loading broken rock into 12 yd. standard gauge dump cars, and two more were added a few months later. All four shovels were in commission until the autumn of 1912, and during this time each sometimes handled as much as 50,000 cu. yds. of rock a month.

One of the difficulties encountered at the outset was the necessity for some method of

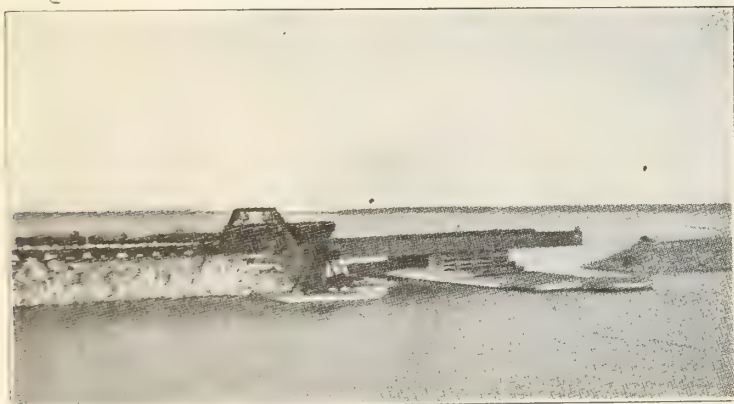
small islands or to a 5 ton anchor block of stone. A forward line was carried from a winch on the barge and used for warping the barge in moving forward.

Two heavy saw logs were attached to the shore end of the barge, with the small ends toward the shore, so that they formed a support for the track until the head of the bank was brought entirely up to grade, usually a distance of not more than 2 ft.

Dumping could generally proceed until the top was within 2 ft. of grade before it was necessary to move ahead. When the dumper was first built it was anticipated that about an hour would be required to move the device, but in actual practice only 3 or 4 minutes were needed, and dumping could proceed as soon as the track was laid over the space left vacant on the head of the bank. Usually the whole operation from start to finish consumed about 15 minutes.

When the fill had been brought up sufficiently near the surface, the floating bridge was moved ahead and the widening and finishing up of the grade was left to be done by side dumping. About one third of the grade was usually added in this way after the floating bridge had moved on.

In closing up the work the gap finally became too short to permit the use of the barges supporting the dumping track. The embankment was then gradually advanced



Making Rainy Lake Rockfill from Pontoon Bridge.



View of Device, Showing Means of Adjustment.

rock bottom was so great that the piers for a series of steel bridges would be very costly. The mud overlying the rock was too soft to hold clusters of piling, but was also pronounced too stiff to allow rock-filled cribs to sink to foundation.

Study of the lake bottom was carried on through the ice for two winters, and was then finished on open water by what is said to have been a more satisfactory method. The summer soundings were made from a 22 by 34-ft. barge with a driving machine over a central well opening. A 70 lb. hammer was used to sink extra heavy 1½ in. strain pipe to refusal. This pipe was joined together in 10 ft. sections by threaded couplings, and steel specials for point and cap were provided. As many as 28 soundings in a day were taken with this equipment.

With this detailed information about the lake bottom at hand, it was decided to make a solid rockfill for the entire crossing. When the most economical projection of the line across the water had been determined, it was found that the fill would have to be more than 60 ft. deep in some places and that a total of about 1,000,000 cu. yds. of rock would be required. Quarries were located on company property near the lake shores, so that an average haul of only 1 mile was necessary. The line was located so as to take advantage of five rocky islands along the route, and of course rock from these was

dumping the rock so that it would give no trouble in settling into the desired position. A very satisfactory solution of this problem was devised in the shape of a dumper consisting of two 6 ft. plate girders 30 ft. apart, with floorbeams 30 ft. apart on the end at which dumping was done, and shorter distances apart for the remainder of the truss. The track was supported on stringers at the centre, leaving distances of 11 ft. between girders and the ends of the ties through which the material was dumped. Originally the girders were 120 ft. long, but they were afterwards lengthened to 140 ft. so as to carry six 12 yd. cars at one time.

The support for the truss, 75 ft. from the embankment end, was a 32 x 112 ft. barge capable of carrying 200,000 lb. for each foot of displacement. When not resting on the head of the bank, the shore end was supported by two pontoons placed about 40 ft. apart. A girder with a portal entrance and bracing carried the weight from the shore end of the dumper to these pontoons. The truss was supported on the main barge by cribbing so that it could be raised or lowered according to the height of the finished embankment above water. For most of the work this was about 15 ft. above the lake surface.

At each end of the barge were capstans from which lines ran out nearly perpendicular for nearly 1,000 ft. to the shores of

from the east until the gap was short enough so that the 140 ft. steel girders could be floated in on the main barge and bearings secured for them on opposite faces of the two approaching fills. The girder ends were then blocked up on the rock and the barge towed out. After the rock voids near the girder supports had been well filled and allowed to settle, the dumping was proceeded with as before from the track on the girders. When the girders were no longer necessary, they were dismantled and removed.

As to the operation of the dumper, the contractors report that there was no delay from the time it was first installed, except once when the rock embankment settled quickly and for a short time there was danger of a locomotive and cars going into the lake. The dumper was carried when empty by the main barge and pontoons so that there was never any danger of it sinking. The entire cost of the dumper did not exceed 1½ c. per cubic yard for the amount of work done by it, and the equipment is in practically as good shape as when constructed.

The fill was made by Johnson & Carey, subcontractors, under Foley, Welch & Stewart, general contractors for the C. N. R. E. S. Johnson designed the dumper specially for the Rainy Lake work.—Engineering Record.

Railway Mechanical Methods and Devices.

Adjustable Driving Device for Driving Wheel Lathe in Grand Trunk Shops.

The fitting of the usual driving dog on the face plate of driving wheel lathes, so that the driving arm may bear against a spoke of the driving wheel, is usually more or less laborious, as after each pair of wheels is turned, the dog must be removed from the face plate, the wheels removed, a new pair inserted, and then the dog applied to the face plate. From the closeness of the space between the driving wheel and the face plate, it is necessary to swing the dog into place by means of a crane.

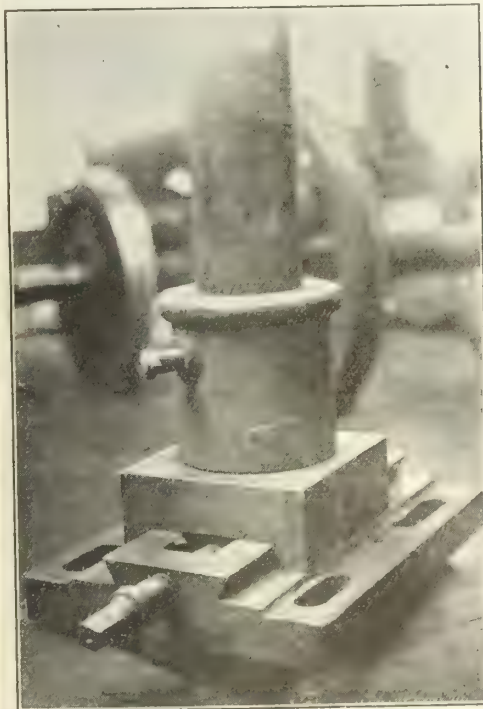
In the G.T.R. shops at Stratford, Ont., there is in use a new type of adjustable driving dog, that does not require to be removed between each pair of wheels. It consists of a cast iron base, bolted to the face plate, with the upper face cut with grooves

the method outlined herein the cost has been nearly cut in half over the practice usually followed of using hoops for heating. The heating pit shown in the foreground is located just inside the car shop door, and is served by a small overhead travelling crane, equipped with an air plunger type of hoist. The crane and air hoist are operated from the wall adjoining.

The pit is about 4 ft. deep, lined with fire-brick, slightly smaller in diameter than the gauge of the track between which it is located. The top of the pit wall has an iron cover ring, into which a thin cast iron cover fits, which can be lifted off by the overhead crane when the pit is required, and placed to one side. When not in use the pit is protected completely. Equidistantly spaced around the outside of the pit, and about 12 ins. below the floor level, are 8 torch nozzles, accessible through the 8 board cover openings in the concrete floor, as shown. In each of these nozzle pits there is a control valve, so that each nozzle may be individu-

For putting on tires, the supporting cylinder in the pit is removed, and from 6 to 8 tires piled in the pit, being raised slightly from the bottom on blocks. In the centre of the bottom there is a special mushroom burner, with a number of small holes around the outside, drilled at an outward angle of about 6 degrees from the centre line. A nozzle, similar to that used in the sides, is used in conjunction with this mushroom burner, the oil and gas being thoroughly mixed by the former before coming into the mushroom. This nozzle is controlled by a three valve arrangement on the wall, one controlling both air and oil, and the other two the air and oil individually. A cover is placed over the top of the pile of tires, after the mushroom burner is ignited, and the tires heat in a few minutes to a sufficient temperature to allow of their fitting over the wheel centres.

In the background of fig. 2 there is shown a double air hoist, on which the wheel centres are elevated. From the pit the tires



Adjustable Driving Device for Driving Wheel Lathe.

to carry a small carriage. In the first dog of this type made, the base, being of cast iron, broke under a heavy cut, but it is the intention in future to make the dogs with a forged base. The small carriage is bored to carry a hollow driving pin, which is held in place by a set screw. The position of the carriage may be shifted on its base by a square threaded screw in the base. With the removable pin, it is only necessary to have it removed when placing a pair of wheels in the lathe, the pin being then replaced, and adjusted to position by the adjusting screw in the base.

Removing and Mounting Passenger Car Wheel Tires in Michigan Central Shops.

The accompanying two illustrations show the practice in the Michigan Central Rd. car shops at St. Thomas, Ont., for removing and replacing passenger car wheel tires. By



Fig. 1. Tire Heating Pit Removing Tires.

ally regulated. For operation, the oil and air are regulated from valves on the wall, which control the whole 8 valves.

For removing tires a cast iron cylinder, of such depth that a wheel placed thereon will have the tire level with the 8 nozzles, is lowered in the pit by the crane. The pair of wheels are picked up by the tackle shown in fig. 1, which consists of a clevis with two chains, the end of each chain carrying an eye bolt, which passes through a hole in the web of the wheel, and is bolted on the opposite side. The pair of wheels are lifted up by the crane, and lowered on the supporting sleeve in the pit. The air and oil are then turned on in the 8 nozzles through the central control valve, a single valve regulating the combined air and oil on the wall, with individual valves also on the wall to regulate either the air or oil. The torches will heat the tire sufficiently to come off in from 2 to 5 minutes. The tire is prevented from coming off by two U's, whereby the wheels can be removed, and the tire forced off.

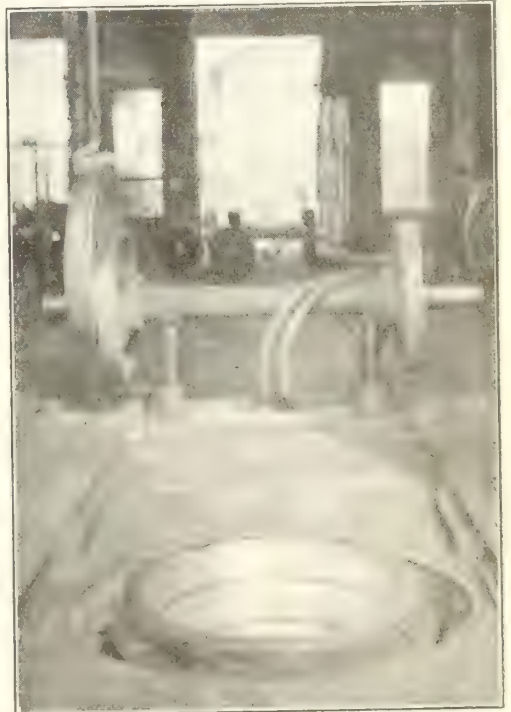


Fig. 2. Tire Heating Pit Heating Tires to Put On.

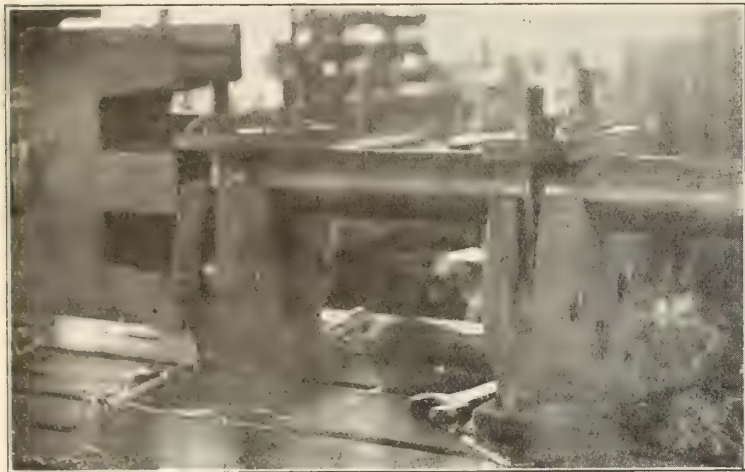
are lifted one by one, with the special clamp arrangement shown to the left in fig. 2, the tire slipped on the centre, and the retaining rings slipped in place, the whole being fastened together by three pin bolts through three of the retaining bolt holes until such time as the bolts may be permanently placed in the latter.

Formerly, when using coal oil or gasoline with the hoop heaters, the cost of mounting a pair of tires was 21c., with the new method, using fuel oil, it has been reduced to 12c. a pair, or almost half.

The arrangement in the shop for handling wheels is handy. The wheels to be re-tired come along outside the shop to the rear of the point from which the views were secured, and pass through the tire removing and tire mounting processes. From there they pass on to the wheel lathe shown in the right background, passing out at the far side of the shop, and along the transfer table there to the tracks where the car trucks are located for replacing in the latter.

Piston Rod V Blocks on Planer in Grand Trunk Shops.

The G.T.R. shops at Stratford, Ont., follow the practice of planing out the crosshead slippers on the assembled crosshead and piston rod, in the planer, with a formed tool that takes the full width of cut of the guide. The tool is fed down from the top, finishing off both sides as it descends, finally removing the full width of babbitt metal



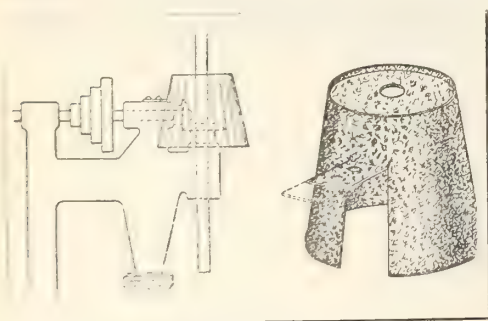
Piston Rod V Blocks on Planer.

at the bottom of the cut. The crosshead and piston rod are mounted in the planer, in the manner shown in the accompanying illustration, on clamp V blocks of simple but accessible form.

These V blocks, as the illustration shows, are slotted castings, with an eye bolt in the slot on either side of the V, and are swung down out of the way when inserting or removing a piston rod. The rod is clamped in place by a strap across the top between the two bolts of each V block.

Bucket Guard for Moving Gears.

The inexpensive, home made guard illustrated herewith was found in use on a drill press in a garage. The device would be equally applicable, however, to a machine shop. It consists simply of an inverted galvanized iron pail, in the bottom of which



Bucket Guard for Moving Gears.

a circular hole was cut so that it might be slipped over the projecting end of the shaft. Two cuts were also made with a hacksaw on one side of the pail, as shown, and the strip of metal thus freed was bent outward and attached to the frame of the drill press by two cap-screws to hold the pail in position. Although the device is crude, it guards the gears effectively. An ingenious person can often make use of homely materials near at hand in this way to fashion them into satisfactory safeguards, at least for temporary use.

Hydraulic Pressure Control for Tube Testing at Grand Trunk Shops.

Among the feature of the process involved in safe-ending locomotive boiler tubes at the G.T.R. shops at Stratford, Ont., described in Canadian Railway and Marine World for Nov., 1912, was that of the hydraulic pressure test on the tubes to determine their safety after end renewal. The operating end of the machine is shown in the accompany-

spring. When the first superheater flues came through for testing, an increased pressure was given the tubes, the same pressure being applied to the smaller tubes as well. It was found that with this, the smaller tubes would frequently be out in the middle, and as this pressure was greater than the test required, it was reduced. The control nut on the regulating valve gives the pressure for the flues when screwed in full way, while the tubes require a lower pressure. This is now obtained by means of inserting



Hydraulic Pressure Central Arrangement for Testing Tubes and Flues.

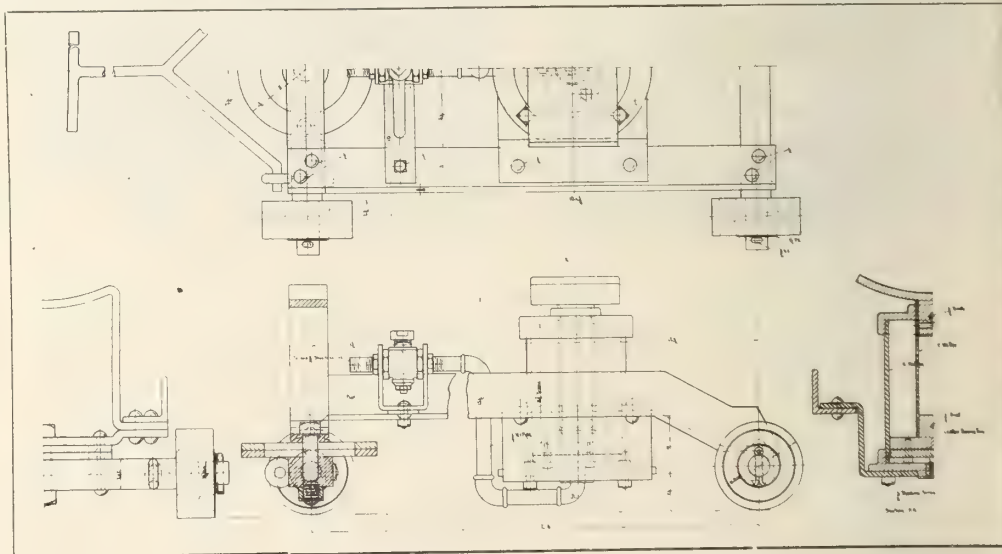
ing illustration. The bed of the machine consists of 2 channels, about 25 ft. long, with a stationary head on the end opposite to that shown, with the latter movable to accommodate the different lengths of tubes met with. This bed frame is on the slope, with the grade towards the stationary end.

The tube is first placed in a cup recess in the stationary end, from which it is nearly filled with water, and when the latter appears from the end shown in the illustration, the piston in the cylinder shown is operated, closing the tube, the latter being practically full of water before this from the slope of

a small steel block under the regulating nut, screwing the latter down on the block, which is fastened to the valve by a light chain, and so is always at hand for use, the change from tubes to flues being only a very simple matter.

Air Jack and Truck for Canadian Northern Railway.

A standard air jack, mounted on a shop truck which has been developed by the Canadian Northern Ry. mechanical department



Arrangement of Air Jack and Truck.

the tube on the frame. The water valve is then shut off, and pressure applied through the valve shown in the tray on the frame. This pressure is regulated from the valve shown on the near end of the drum suspended below the frame, and it is this feature that is unique. The pressure regulating valve is an ordinary air reducing valve, which gives the varying pressures required by screwing in or out the nut on the near end, compressing or releasing the contained

for shop use, is illustrated herewith. The truck consists of a pair of 3 x 3 x 3/8 in. angles for side frames, mounted on a pair of 2 in. square axles, the front one of which has a swivel action. The air cylinder is carried between the angle side members by a dry steel plate member, 3/8 in. thick, which forms a central table. The air cylinder is a length of 6 in. pipe, with cast iron caps, containing a two piece leather bushed cast iron piston, with 2 in. pipe for plunger.

Railway Development, Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—In an interview at Edmonton, Alta., Jan. 5, J. D. McArthur, President, is reported to have said that track had been laid on this line to mileage 182, or 17 miles on the Edmonton side of Christmas River, and that it was expected to have it laid into Fort McMurray by April 1. Ballasting has been completed for some miles beyond Lac la Biche, and is being gone on with as fast as possible. (Jan., pg. 10.)

Burrard Inlet Tunnel and Bridge Co.—At a recent meeting of directors in North Vancouver, B.C., the acting chairman reported that the company was unable to proceed with the construction of the projected bridge across the Second Narrows of Vancouver Inlet, and the other works covered by the charter, and that all arrangements had been made for an application to the Dominion Parliament for the renewal of the charter which expires in April. (Dec., 1915, pg. 469.)

Canadian Pacific Ry.—A deputation from Moose Jaw, Sask., waited upon Grant Hall, Vice President and General Manager, Western Lines, recently, to ask that the company build the necessary mileage to complete a through line between Moose Jaw and Assiniboia. The line at present extends from Moose Jaw through Expanse to Vantage, from which point an extension of eight miles would connect up with a line at present in existence from Assiniboia. (Jan., pg. 10.)

Canadian Terminal Ry.—Application has been made to the New Brunswick Government for a recommendation to the Legislature for a guarantee of bonds for \$20,000 a mile for building a railway from Pennfold on the C.P.R. to connect with Beaver Harbor, Blacks Harbor and L'Etang, and to also have a connection with Eastport, Me. A similar application was made in 1915, but was not granted. (May, 1915, pg. 170.)

Central Canada Ry.—In an interview at Edmonton, Alta., Jan. 5, J. D. McArthur, President, is reported to have said that a train service is being given over the line from McLennan, on the Edmonton, Dunvegan and British Columbia Ry., to the Heart River. It was expected to complete the substructure for the bridge across this river Jan. 30, and the superstructure by Mar. 30. Tracklaying will then be resumed and completed to Peace River. (Jan., pg. 10.)

Central Western Canada Ry.—Application is being made to the Dominion Parliament for an extension of time for the building of this projected railway from Winnipeg northwesterly via Yorkton, Saskatoon and Battleford to Edmonton, Alberta. Pringle and Guthrie, Ottawa, solicitors for applicants. (May, 1914, pg. 121.)

Churchill Southern Ry.—The Manitoba Legislature is being asked to extend the time for the building of this projected railway from Fort Churchill southerly to Kettle Rapids, on the Hudson Bay Ry., with branch lines to any point in Manitoba. (Mar., 1914, pg. 121.)

Edmonton, Dunvegan and British Columbia Ry.—In an interview at Edmonton, Alta., Jan. 5, J. D. McArthur, President, is reported to have said that track had been laid beyond Smoky River as far as Burnt River, and was expected to reach Spirit River by Jan. 31, and would be continued immediately thereafter on the branch line to the Grande Prairie settlement, the grading upon which is fully completed. Construction material

for a grain elevator is being delivered at Spirit River. The line is reported fully ballasted to within four miles of McLennan, and the first left of ballast for 15 miles beyond. (Jan., pg. 10.)

Essex Terminal Ry.—The Ontario Legislature is being asked to confirm a bylaw of the City of Windsor granting a right of way and other rights in the city to the company. (May, 1915, pg. 170.)

Grand Trunk Pacific Ry.—A press report states that grading has been completed on the branch line from Harte to Brandon, Man., 26 miles. No track has been laid.

A press report states that grading on the branch line from Young has been completed into Prince Albert, Sask., about 25 miles beyond the present end of track at St. Louis, on the Saskatchewan River.

The Board of Railway Commissioners has authorized the laying of a spur line in the n.e. $\frac{1}{4}$ of sec. 5, s.e. $\frac{1}{4}$ of sec. 7, tsp. 53, range 23, North Alberta, for the Great West Coal Co. This is a spur from the coal area branches starting out from Bickerdike. (Jan., pg. 10.)

Grand Trunk Ry.—The Lachine, Jacques Cartier and Maisonneuve Ry. Co. on Jan. 4 asked the Board of Railway Commissioners for approval of the location plans of the line, which crosses a number of streets in Montreal. The City of Montreal asked that the company be directed to construct subways at several of the street crossings, and that the city be protected from all claims for land damages. The Canadian Northern Ry. is also interested in the matter, and its counsel expressed a willingness to accept any arrangement made with the G.T.R., which is the senior company. The plans were referred to the Commissioners' Chief Engineer for report.

A press report states that the company is arranging for the construction of a new freight shed and additional trackage at Detroit, Mich., to cost about \$300,000. (Jan., pg. 10.)

Great Northern Ry. Lines in Canada.—A press report states that engineers are making surveys for a railway from Port Arthur, Ont., to Duluth, Minn., in the interests of the Great Northern Minnesota and Duluth Rd. The title would imply a connection with the Great Northern Ry., U.S.A., and that it is a Minnesota State charter. We are unaware of any charter being in existence covering the Ontario end of such a line. During the last year or more G.N.R. engineers have been reported to be working between Port Arthur and the International Boundary line, and to have acquired land suitable for railway terminals in the vicinity of Port Arthur and Fort William.

The Board of Railway Commissioners has approved the company's plans for a station building on the False Creek flats, Vancouver. This was reported to the city council Dec. 10, but on Jan. 3 the council decided to call attention to the fact that the Board had directed that actual construction be started on the station by Dec. 1, 1915, which had not been done. (Jan., pg. 10.)

Joliette and Lake Manuan Colonization Ry.—The Dominion Parliament is being asked to extend the time for the building of this projected railway from Joliette to the National Transcontinental Ry., and from Joliette to Montreal. J. Ritchie, Ottawa, solicitor for company. (May, 1914, pg. 214.)

Kettle Valley Lines.—The Dominion Parliament is being asked to confirm an agree-

ment made July 10, 1914, with the Vancouver, Victoria and Eastern Ry. and Navigation Co., with respect to the operation of a joint section from Princeton to Otter Summit, B.C.

Owing to bad weather and other causes there has been a delay in the completion of the bridge over the Ladner Creek on the Coquihalla Valley section. Tracklaying and other work has been suspended until the spring, and it is not expected that the line will be opened for traffic until the summer. (Jan., pg. 10.)

Manitoba-Ontario Ry.—The Dominion Parliament is being asked to incorporate a company with this title to build a railway from Fort William by the most feasible route to Falcon Island on Lake of the Woods, and across the lake, and by the most feasible route to Winnipeg; a line from Fort William southwesterly to the International boundary between Rainy Lake and Pigeon Bay, and a branch from the first mentioned line from near Manitou Lake northwesterly to Dryden on the C.P.R., and thence northerly to a junction with the National Transcontinental Ry. Dowler and Dowler, Fort William, Ont., solicitors for applicants.

Winnipeg papers, commenting on the notice of application, state that a project of this kind has been talked of at different times during the past 30 years, but its construction may now be looked upon as being within the region of practicability, seeing that the Greater Winnipeg Water District has built a railway from St. Boniface to Shoal Lake, an arm of the Lake of the Woods, 90 miles. The present project is said to be directed by Mackenzie, Mann & Co. interests, and reports state that engineers representing that firm have been making surveys during the past 18 months in the district to be traversed. The purchase of the Greater Winnipeg Water District's railway is talked of as being part of the plans. The Mayor of Winnipeg is reported to have said that the matter of the sale of the Water District's line had been talked of casually in connection with a projected building of an all-Canadian section of the Canadian Northern Ry. between Fort William and Winnipeg. Such a line would be of great benefit, but at present he had no official knowledge of the matter. (See Greater Winnipeg Water District, Jan., pg. 10.)

Pacific Great Eastern Ry.—It is reported that the reconstruction of the bridge over the Capilano River on the North Vancouver-Dundarave section of the line, which was damaged by a log drive recently, is practically completed, and that traffic will be resumed shortly. Pending reconstruction of the bridge, the company has used automobiles for carrying of passengers between the termini.

The new Premier of British Columbia, in a recent speech is reported to have stated that four-fifths of the work on the line between North Vancouver and Fort George had been completed, but in order to secure its completion it will be necessary for the Legislature to make some further financial arrangements. The extension of the line from Fort George to Peace River is also necessary if the province is to reap the full advantage of its investment in the line. A committee of the Cabinet has been appointed to investigate the whole matter, and to report as to what further aid is necessary. (Jan., pg. 11.)

Pere Marquette Rd.—We are officially advised that the company does not intend to

lay a second track between Blenheim and Wilkie, Ont., about four miles on its Canadian Division, as a recent press report stated.

Quebec Bridge.—H. P. Borden, Assistant to the Chief Engineer, is credited with the statement that the construction of the Quebec Bridge will be completed about the end of this year. The central suspended span will, it is expected, be floated into position about October.

Quebec Central Ry.—We are officially advised that it is not likely any further extension of the Chaudiere Valley line beyond English Lake will be built at present. (Jan., pg. 16.)

St. Francis Valley Ry.—The Quebec Legislature is being asked to extend the time for the building of this projected railway from between Richmond or Melbourne, and St.

Francois du Lac, Que. Beique and Beique, Montreal, solicitors for applicants. (Aug., 1914, pg. 371.)

Toronto, Hamilton and Buffalo Ry.—We are officially advised that it is expected to begin construction on the extension of the Erie and Ontario Ry., which now extends from Smithville to Dunnville, on to Port Maitland, early in the spring. The extension to Port Maitland will be 4.5 miles, making the total length of the line about 20 miles. No contract has been let for grading, and we are advised that all other work will be undertaken by the company's own staff. R. L. Latham, Hamilton, Ont., is Chief Engineer. (Oct., 1915, pg. 393.)

Wabash Ry.—A press report states that plans have been prepared for the enlargement of the company's locomotive house, and trackage facilities at St. Thomas, Ont.

Birthdays of Transportation Men in February.

Many happy returns of the day to:—

B. H. Bennett, General Agent, Chicago and North Western Ry., Toronto, born at Cobourg, Ont., Feb. 6, 1858.

F. L. C. Bond, Division Engineer, Eastern Lines, G.T.R., Montreal, born there Feb. 21, 1877.

T. Britt, General Fuel Agent, C.P.R., Montreal, born there Feb. 3, 1871.

G. E. Bunting, General Western Freight Agent, Allan Line Steamships, and Manager, Allan and Co., Chicago, Ill., born at Toronto, Feb. 8, 1873.

J. S. Byrom, Superintendent, Great Lakes Steamships, Canadian Pacific Ry., Port McNicoll, Ont., born at Jersey City, N.Y., Feb. 10, 1872.

J. J. Callahan, Manager of Operation, London and Port Stanley Ry., London, Ont., born at New Glasgow, Que., Feb. 25, 1875.

H. R. Charlton, General Advertising Agent, G.T.R. and G.T.P.R., Montreal, born at St. Johns, Que., Feb. 9, 1866.

R. Colclough, Superintendent, Intercolonial Ry., Levis, Que., born at Bic, Que., Feb. 24, 1871.

F. W. Cooper, A.M.Can.Soc.C.E., Superintendent, District 1, Eastern Division, C.P.R., Farnham, Que., born at London, Ont., Feb. 16, 1880.

R. Crawford, Northwest Agent, Northern Navigation Co., Winnipeg, Man., born at Kingston, Ont., Feb. 21, 1870.

A. J. Donegan, Superintendent, Algoma Eastern Ry., Sudbury, Ont., born at Perth, Ont., Feb. 17, 1872.

R. W. Drew, Division Freight Agent, Saskatchewan Division, C.P.R., Regina, born at Kingston, Ont., Feb. 17, 1874.

E. A. Evans, M.Can.Soc.C.E., ex-General Manager and Chief Engineer, Quebec Ry., Light and Power Co., Quebec, born at Kensington, London, England, Feb. 26, 1855.

Goodwin Ford, General Superintendent, Western Lines, Dominion Express Co., Winnipeg, born at Bordentown, N.J., Feb. 23, 1859.

L. O. Genest, General Storekeeper, Western Lines, C.P.R., Winnipeg, born at St. Henri, Levis County, Que., Feb. 16, 1856.

J. H. Guess, ex-General Purchasing Agent, Grand Trunk Ry., Montreal, born at Raleigh, N.C., Feb. 5, 1878.

J. C. Holden, A.M.Can.Soc.C.E., Division Engineer, C.P.R., Winnipeg, born at St. John, N.B., Feb., 1876.

T. C. Hudson, Division Master Mechanic, Quebec Grand Division, Canadian Northern Ry., Joliette, Que., born at Brockville, Ont., Feb. 20, 1873.

H. Hulatt, Manager of Telegraphs, G.T.R. and Grand Trunk Pacific Ry., Montreal, born in London, Eng., Feb. 15, 1883.

C. Gardner Johnson, Lloyds' Agent for

British Columbia, Vancouver, B.C., born at Dunblane, Scotland, Feb. 8, 1857.

F. C. Johnson, Night Locomotive Foreman, C.P.R., North Transcona, Man., born at Montreal, Feb. 26, 1885.

John McCraw, General Agent, Central Vermont Ry., New London, Conn., born at Craigvale, Ont., Feb. 6, 1868.

G. L. McCrea, Local Freight Agent, C.P.R., Vancouver, B.C., born at Springtown, Ont., Feb. 9, 1876.

D. McDonald, District Passenger Agent, Canadian Government Railways, Montreal, born at Ste. Hyacinthe, Que., Feb. 28, 1862.

T. McNabb, ex-Master Mechanic, Alberta Ry. and Irrigation Co., now of Picture Butte, Alta., born in Scotland, Feb. 16, 1849.

J. K. McNellie, General Superintendent, Canadian Government Railways, Moncton, N.B., born at Toronto, Feb. 23, 1874.

D. C. Macdonald, Assistant General Claims Agent, C.P.R., Winnipeg, born at Elmsdale, N.S., Feb. 9, 1874.

C. S. Maharg, Superintendent, District 3, Manitoba Division, C.P.R., Brandon, born in Dufferin County, Ont., Feb. 4, 1867.

V. J. Melsted, Engineer of Water Service, Western Lines, C.P.R., Winnipeg, born at Gardar, N.D., Feb. 20, 1887.

G. A. Montgomery, General Superintendent, Algoma Central and Hudson Bay Ry., and Algoma Eastern Ry., Sault Ste. Marie, Ont., born at Bradford, Ont., Feb. 11, 1871.

A. Z. Mullins, Commercial Agent, G.T.R., Grand Rapids, Mich., born at Appin, Ont., Feb. 14, 1862.

M. G. Murphy, District Passenger Agent, C.P.R., Toronto, born at Halifax, N.S., Feb. 26, 1878.

J. E. Proctor, District Passenger Agent, C.P.R., Regina, Sask., born at Sarnia, Ont., Feb. 17, 1878.

C. T. Ridalls, Car Foreman, C.P.R., London, Ont., born at St. Heliers, Jersey, Channel Islands, Feb. 8, 1864.

J. E. Robitaille, Treasurer, Roberval-Saguenay Ry., Chicoutimi, Que., born at Quebec, Feb. 17, 1870.

A. E. Rosevear, General Freight Agent, G.T. Pacific Ry. and G.T. Pacific Coast Steamship Co., Winnipeg, born at Montreal, Feb. 20, 1863.

J. G. Scott, ex-General Manager, Quebec and Lake St. John Ry., Quebec, born there Feb. 13, 1847.

J. J. Scully, General Superintendent, Lake Superior Division, C.P.R., North Bay, Ont., born at Montreal, Feb. 3, 1872.

G. Spencer, Assistant Chief Operating Officer, Board of Railway Commissioners, Winnipeg, born in London, Eng., Feb. 21, 1865.

R. H. Sperling, Assistant to Chairman of the Board, British Columbia Electric Ry., London, Eng., born there, Feb. 9, 1876.

H. E. Suckling, Treasurer, C.P.R., Montreal, born at Gibraltar, Feb. 27, 1851.

Hugh Sutherland, Executive Agent, Canadian Northern Ry., Winnipeg, Man., born at New London, P.E.I., Feb. 22, 1845.

F. L. Wanklyn, M.Can.Soc.C.E., General Executive Assistant, C.P.R., Montreal, born at Buenos Ayres, Feb. 25, 1860.

J. R. Watson, Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Eastern Lines, C.P.R., Montreal, born at Morpeth, Eng., Feb. 8, 1873.

John L. Weller, M.Can.Soc.C.E., Engineer in Charge, Welland Ship Canal, St. Catharines, Ont., born at Cobourg, Ont., Feb. 13, 1862.

A. Williams, Superintendent, District 2, Atlantic Division, C.P.R., Woodstock, N.B., born at Mono Road, Ont., Feb. 22, 1872.

Freight Rate Increases in Western U.S. Classification Territory.

The Interstate Commerce Commission gave a decision at Washington, D.C., Dec. 18, 1915, which was summarized as follows:—

Proposed increased carload rates on agricultural implements justified except to points in Louisiana, and to those points not justified.

Proposed increased carload rates on canned goods and flue lining in western trunk line territory justified.

Proposed increased carload rates on eggs from points in Kansas and other points to southwestern points not justified.

Proposed increased carload rates on cider and vinegar from interstate points to Kansas and Missouri not justified.

Proposed increased carload rates on bauxite ore to certain points justified, and to certain other points not justified.

Proposed increased carload rates on boots and shoes, leather, and boot and shoe findings between Missouri manufacturing points and interstate points justified; proposed less-than-carload rates between same points and increases in carload minima not justified.

Proposed increased rates on dried and evaporated fruits in portions of western trunk line territory justified.

Proposed readjustment of rates to Louisiana not justified.

Proposed increased carload rates on furniture from Kansas City and other points to Oklahoma groups 6, 7, and 8 justified; proposed increase to Oklahoma group 9 not justified.

Proposed increased less than carload rates to and from manufacturing points in Missouri on various commodities found unlawful when made to vary with quantity shipped; other proposed increases justified.

Proposed charges for switching "run-by and setback" grain justified.

Proposed transit charges on fruits and vegetables in western trunk line and trans-Missouri territory justified.

Proposed increases upon miscellaneous items justified; others not justified.

The Roberval-Saguenay Ry. has been admitted to the Eastern Canadian Passenger Agents Association's membership, its representative being J. E. Robitaille, G.F. & P.A.

NOTICE.

C. F. Buchanan, of the United States of America, the owner of the exclusive rights to Canadian patent no. 153287, issued to J. B. Cox, and covering improvements in Smoke Jacks, wishes to advise that all possible users of Smoke Jacks covered by this patent can obtain them within reasonable time for use on any railway in the Dominion of Canada.

All enquiries regarding the above should be addressed to C. F. Buchanan, c-o Coleman Fare Box Co., Ltd., 70 Bond Street, Toronto, Ontario, Canada.

February, 1916.]

Railway Rolling Stock Notes.

The French Government has ordered 2,000 freight cars from Canadian Car and Foundry Co., as reported in our last issue.

The Canadian Northern Ry. has received 4 tank cars, nos. 7161-7164, built in the United States.

The Grand Trunk Pacific Ry. is applying Schmidt type A superheaters to 14 class D2 consolidation, and 5 class E1 mogul locomotives.

The Central Vermont Ry., a subsidiary of the G.T.R., has ordered 1 ten wheel, and 6 consolidation locomotives from American Locomotive Co.

Canadian Government Railways has received a 100 ton wrecking crane from F. H. Hopkins and Co., and 2 consolidation locomotives from Canadian Algis-Chalmers, Ltd.

Canadian Government Railways, operating the National Transcontinental Ry., is renting some locomotives from the Grand Trunk Pacific Ry., and now has 31 of these in use over the line.

The Canada Cement Co. has ordered 12 narrow gauge charging cars, and 30 narrow gauge ingot cars, from Canadian Car and Foundry Co., for February delivery. They will be built at Turcot Works, Montreal.

The C.P.R. has ordered 12 steel mail cars, 1 steel mail and baggage car, 4 steel baggage cars and 1 steel dining car, at its Angus Shops. The order was foreshadowed in Canadian Railway and Marine World for January.

The Timiskaming & Northern Ontario Ry. was stated recently to be in the market for 2 mountain (4-8-2) type and 4 consolidation (2-8-0) type locomotives. We were officially advised, Jan. 3, that the report was quite unwarranted, that no tenders had been invited and no offers received.

The Michigan Central Rd. has ordered 150 steel underframes for flat cars of 100,000 lbs. capacity, from Canadian Car and Foundry Co. The frames will be built at the Dominion Works, Montreal, and the cars will be completed at the M.C.R. shops at St. Thomas, Ont.

Sir John C. Eaton, Toronto, has cancelled the order which he gave to the Preston Car & Coach Co. for a private car and which was announced in Canadian Railway and Marine World for April, 1915. He is said to be negotiating with United States car builders.

Canadian Government Railways has ordered 15 consolidation locomotives and 10 Pacific passenger locomotives from Canadian Locomotive Co., as mentioned in our last issue, and has also ordered 200 wood underframe stock cars, 60,000 lbs. capacity, from Canadian Car and Foundry Co. The cars will be built at Amherst, N.S.

Canadian Government Railways is applying superheaters to 43 Pacific and 117 consolidation locomotives. Of this number, 5 Pacific and 1 consolidation have been converted, and the work is being continued monthly until the whole are equipped. The superheater used is Schmidt type A, manufactured and supplied by the Locomotive Superheater Co.

The French Government has ordered 4,000 freight cars from the National Steel Car Co., Hamilton, Ont. They will be of the customary European type with 4 wheels 41 ins. diar. of rolled steel, or steel tired, axles $5\frac{1}{2}$ by 10 ins., bodies about 24 ft. long by $8\frac{1}{2}$ ft. wide and about 18 tons capacity. They will be equipped with hand brakes, and the usual draft gear, bumpers, etc., standard on European railways.

Following are details of the 10 Pacific

type locomotives which Canadian Government Railways has ordered from Canadian Locomotive Co., as mentioned in our last issue,—

Weight on drivers	150,000 lbs.
Weight in working order, total	230,000 lbs.
Wheel base of engine, rigid	13 ft.
Wheel base engine, total	33 ft. 6 ins.
Wheel base engine and tender	65 ft. 1 in.
Driving wheels diar.	73 ins.
Driving wheels, material and centres	Cast steel
Driving journals	10 by 13 ins.
Cylinders, diar. and stroke	23 $\frac{1}{2}$ x 28 ins.
Boiler type	Radial stay
Boiler pressure	200 lbs.
Tubes, no. and diar.	200, 2 ins.; 28, 5 $\frac{1}{2}$ ins.
Tubes, length	20 ft. 6 ins.
Injectors	Locomotive type
Brakes	Westinghouse American
Packing	Metallic
Superheater	Schmidt type A
Cab	Vestibule type
Weight of tender loaded	150,000 lbs.
Tank capacity	6,500 imp. galls.
Coal capacity	10 tons
Truck, type	4 wheel equalized
Wheel, diar. and type	36 ins. steel tired
Journals	5 $\frac{1}{2}$ x 10 ins. M.C.R.
Brake beam	Simplex high speed

Following are chief details of the 15 consolidation locomotives which Canadian Government Railways has ordered from Canadian Locomotive Co., as mentioned in our last issue,—

Weight on drivers	208,000 lbs.
Weight in working order, total	236,000 lbs.
Wheel base, rigid	16 ft. 6 ins.
Wheel base, total	25 ft. 5 ins.
Wheel base, engine and tender	69 ft. 11 ins.
Heating surface, firebox	207 sq. ft.
Heating surface, tubes	1,885 sq. ft.
Heating surface, total	2,092 sq. ft.
Driving wheels, diar.	63 ins.
Driving wheels, material	Cast steel
Driving journals	10 by 14 ins.
Cylinders, diar. and stroke	24 x 32 ins.
Boiler, type	Straight top, radial stay
Boiler pressure	180 lbs.
Tubes, no. and diar.	227, 2 ins.; 30, 5 $\frac{1}{2}$ ins.
Tubes, length	15 ft. 2 $\frac{1}{2}$ ins.
Injectors and safety valve	Locomotive type
Brakes	Westinghouse American
Packing	Metallic
Superheater	Schmidt, type A
Valve gear	Walschaert
Weight of tender, loaded	140,000 lbs.
Tank capacity	6,500 imp. galls.
Coal capacity	10 tons
Tender truck	Outside equalized
Tender wheels	34 ins. diar.
Wheels, type	W.I. centre, steel tired
Truck journals	5 $\frac{1}{2}$ by 10 ins.
Brake beams	Steel I section

Alberta Public Utilities Commission Rules of Practice.

The recently appointed Board of Public Utilities Commission for Alberta has issued its rules of practice for the guidance of those who will have business before it. The Commission proposes to sit on Tuesdays at 11 a.m. to hear and dispose of applications, complaints, etc., except during July and August, when special sittings will be arranged on application to the Secretary. Sittings may be arranged on other days than Tuesdays, and at other places than Edmonton, where the fixed regular sittings will be held. Six days must elapse between service of notice of application or complaint, and the hearing. The applicant is to file notice of application with copies of any documents, maps or plans necessary to his case, with the Secretary, to which the respondent is to file a written reply. In contested cases the hearing on presentation of the application shall be of a preliminary nature, and reasonable delay shall be allowed before the hearing upon disputed facts. If it appears to the Board that a question of law is involved which it would be convenient to have settled before further proceeding with the case, it may be raised by special stated case or otherwise as the Board deems expedient. The Board may ap-

point any person to make an enquiry and report on any matter pending before it, or over which it has jurisdiction, and may order by whom the expense is to be borne. The Board may order the attendance of any witnesses necessary, and it may issue commissions to take evidence outside Alberta. Evidence by affidavit may be accepted. The conduct of all its proceedings shall be governed by rules adopted by it, but it is not to be bound by the technical rules of legal evidence. Written briefs may be required, and in any case not otherwise provided for the Board may define its procedure. In the case of want of prosecution the Board may, on application, or upon its own initiative, proceed to deal with and dispose of the matter as shall appear proper. Wilful disobedience of an interlocutory order may in the discretion of the Board, in the case of an applicant, result in a stay of proceedings or dismissal of the application, and in the case of a respondent as a withdrawal from the proceedings.

Detroit Reconsigning Case.—In the case of Detroit Coal Co. vs. Michigan Central Rd., the Interstate Commerce Commission decided at Washington, D.C., on Dec. 18, 1915, as follows:—"The tariffs of respondents authorized, under certain circumstances, a charge of \$2 per car for reconsigning coal at Detroit, Mich., to points within the switching limits of that city, but the provisions of the tariff did not, as contended by the complainant, make the imposition of the charge conditional upon the terminal carriers having first given the consignee at Detroit notice that the car had arrived at Toledo, Ohio. Charges collected upon the shipments involved in the complaint not shown to have been unreasonable. Reparation denied and complaint dismissed."

G.T.R. President's New Year's Greeting.—E. J. Chamberlin, President, Grand Trunk and G.T. Pacific Rys., sent the following message, Dec. 31:—"At the closing of the old year and the beginning of the new, I desire to extend to all the officers and employees of the company, my best wishes for the health and happiness of themselves and families during the new year, and to thank them on behalf of myself and the board of directors for the loyal and efficient service rendered the company during the past year by all classes of employees and to solicit the cooperation of every employee in making the Grand Trunk Ry and its service to the public for 1916, the best of any railway on the continent."

Car Operation over Arlington Bridge, Winnipeg.—The Manitoba Public Utilities Commissioner some time since made an order respecting the operation of cars across the Arlington bridge, Winnipeg, by the Winnipeg Electric Ry. The night men made a protest, which was subsequently endorsed by the day men, and a deputation waited on the Commissioner's engineer asking that the company be directed to provide adequate safety appliances on the cars. There is a considerable gradient at the bridge, and a street car crossing at the foot of the gradient. Up to Jan. 10 there has been no regular car service across the bridge.

Short Billing of Freight Alleged.—The Canadian Pacific Ry., according to a press report, has begun an action in an Alberta court, against the Taylor Miller Co., Lethbridge, asking for an accounting and for damages for breach of warranty and breach of contract. The C.P.R. has carried large quantities of grain for the milling company, and alleges in the statement of claim that the waybills showed smaller quantities of grain than were actually carried, in consequence of which the plaintiffs lost certain sums chargeable on the grain so carried.

Freight and Passenger Traffic Notes.

The Lake Erie and Northern Ry.'s standard freight mileage tariff C.R.C.1, and its standard passenger tariff C.R.C.1, have been approved by the Board of Railway Commissioners.

C.P.R. train 16 started, Jan. 3, leaving Montreal daily, except Saturday, for Halifax, and train 15 started leaving Halifax, N.S., and St. John, N.B., daily, except Sunday.

The Great Northern Ry. announced, Jan. 4, that from that date all cars loaded with forest products in British Columbia destined for points on its line in the east would be carried through without being transferred.

Canadian Government Railways Maritime Express between Halifax, N.S., and Montreal, which until January ran daily except Saturday, now runs daily, and the Ocean Limited between the same points, which was running daily, now runs daily except Saturdays.

The Pacific Great Eastern Ry. has extended its train service from Lillooet to Clinton, B.C., 47 miles. It has 166 miles of track in operation from Squamish to Clinton, in addition to the short mileage from North Vancouver to Dunadave, in the direction of Squamish.

The C.P.R. sleeping car heretofore run on trains 17 and 18 between Montreal and Cochrane, Ont., now runs daily between Montreal and Timmins, Ont., passing through Timagami, Cobalt, Haileybury, Liskeard, Englehart, Dane, Matheson, Porcupine and Schumacher.

The C.P.R. steamships Empress of Russia and Empress of Japan, on their passages from Vancouver westbound, call at Manila, but not at Shanghai, passengers for the latter port being transferred at Nagasaki. On the trip east to Vancouver these vessels call at Shanghai, but not at Manila.

The C.P.R. announces that an agreement has been made with the Spokane and Inland Empire Ry. under which there will be an interchange of passenger traffic at Spokane, Wash., with the Spokane International Ry., which makes a connection with the C.P.R. near Yahk, B.C., by a subsidiary line, the Eastern British Columbia Ry.

The Intercolonial Ry.'s newly completed Dartmouth to Deans, N.S., branch was opened for traffic, Jan. 3. A train leaves Upper Musquodoboit on Tuesdays, Thursdays and Saturdays, at 5.30 a.m., returning from Dartmouth at 3 p.m. The present end of track is at Deans, a short distance beyond Upper Musquodoboit.

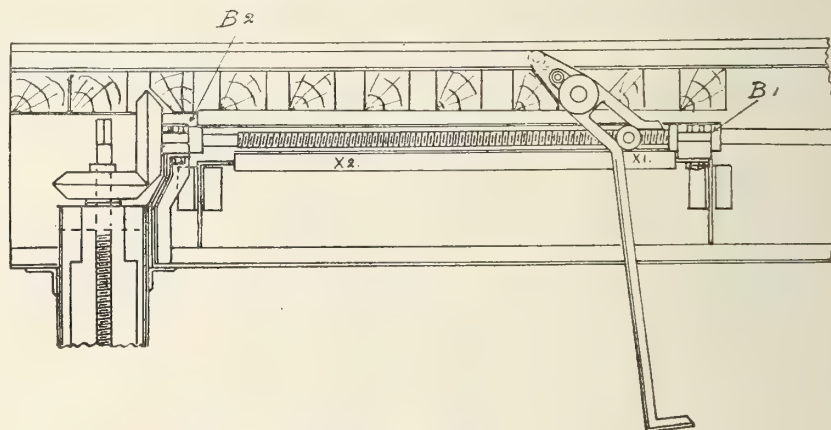
Under present conditions in Mexico, several Canadian railways have announced that through tickets must not be sold or baggage checked to that country, but that intending passengers should be ticketed to Laredo, Eagle Pass, El Paso, Texas, or Nogales, Ariz. The Mexican authorities announce that the Constitutionalist railway trains arrive and depart from the International and Great Northern Ry. station at Laredo, and are running regularly.

The North Pacific Coast Passenger Association met at Seattle, Wash., Jan. 12, to discuss the question of the reduction of fares now in force, between Puget Sound and Alaska, and the through rates to the east in connection therewith, with a view to adjust them to meet the lower rates quoted by the Grand Trunk Pacific Ry., via Prince Rupert. The rate prevailing from Ketchikan is \$16 higher, and that from Juneau, Alaska, is \$10 higher, to points in the east via Seattle, than the rates quoted

by the G.T. Pacific Ry. via Prince Rupert. The C.P.R. rate from the same points via Vancouver has already been adjusted to meet the G.T.P. rate.

The Intercolonial Ry. put in force on Jan. 16 an order changing the numbering of its trains, in order to get a more uniform system than in the past. All the passenger trains, except the Ocean Limited, have been given the low numbers between 1 and 50. The local mixed and suburban trains have been given numbers in a series that will correspond with the numbers of each district superintendent's district. For instance, the suburbans on District 1 will be in a series up to 100, in District 2 from 100 to 200, and so on up to District 5, which will be in the 500 series. The fast freights are in the 800 series. Way freights are in the 600 series. A separate timetable is being prepared for each superintendent's district.

It was announced in the West, Dec. 30, that the Canadian Northern Ry. had placed an embargo on all grain shipments to Port Arthur, beginning on Jan. 1. It was stated that the embargo would not apply to shipments to Duluth, Minneapolis and other U.S. grain centres. The cause of the embargo was stated to be the congestion at



Section of Drawbridge Showing Post Spindle.

the Government elevators at Westfort and Port Arthur. G. H. Shaw, General Traffic Manager, Toronto, made the following statement:—"The embargo on grain shipments to Port Arthur for storage is a precautionary measure taken by the Canadian Northern in the public interest. It is a temporary expedient and means the movement of grain for the moment to other storage points served by its line."

Railway Finance, Meetings, Etc.

Canadian Pacific Ry.—The Dominion Parliament is being asked to extend the company's powers in respect of the issuance of consolidated debenture stock, now or hereafter to be issued, by the conversion thereof into denominations of Canadian currency.

Central Ry. of Canada.—The case of the Central Ry. Co. of Canada against the British Corporation of Mexico, Ltd., for damages for failure to take up 150,000 debenture bonds at 90%, was before the Chancery Division in London, England, recently, and was remitted to the official referee on the question of damages.

Great Northern Ry. and Mining Co.—The quarries, plaster areas and railway line owned by the company were sold at Port Hood, N.B., by the sheriff recently, to satisfy the claim of P. M. O'Neill, who holds

a judgment for \$3,000 against the company. The buyer was N. Levoie, General Manager, Banque Nationale, who, it is said, was acting on behalf of the bondholders, the purchase price being \$115,000. Other claims amounting to \$15,000 will be discharged by the purchasers. A Halifax press dispatch states that the ultimate purchaser is P. M. O'Neill, the judgment creditor, of St. John, N.B., who proposes to operate the plant.

White Pass and Yukon Route.—Gross earnings from Jan. 1 to Nov. 30, \$1,460,524, against \$1,493,459 for the same period 1914.

Detecting the Cause of Post Spindle Breaking.

A drawbridge that has been in service for nearly 30 years had latterly a peculiar tendency to break a post spindle from time to time. The bridge was at a considerable distance from the main office, and the supervision was entrusted to a local agent, and all he knew was that when the spindle broke to order a new one from the local machine shop, and forward the bill for payment. The bills came too often and the management decided on sending an experienced engineer to try and discover the cause of the repeated breakages, and it was soon found upon tracing the various points

that the gearing was changed from a comparatively light gear to a heavier gear. By referring to the bearing B1 on the drawing it will be seen that the bearing is proportionately heavy enough, when re-bored to take the heavier shafting. The bearing box, B2, was re-bored too much in the cup, in order not to make the bottom part too light. By reason of the bearing separating plate being much higher at that end than at the other, the effect was that the spindle was a quarter of an inch out of line.

It was also learned that the spur gears had been changed from time to time without paying due regard as to whether they were the exact mesh or not, consequently shims had to be placed below the bearing box so that the spur teeth would not lock each other, and with this added cause, the spindle was thrown half an inch out of line.

It will therefore be readily understood that the attachment XI, through which the spindle passes, under these conditions of the spindle bearings, between rigid angle-bar guides, managed to carry the spindle as far as X2 by considerably bending or sagging the spindle, but after repeated operations and consequent bendings the spindle finally broke at that point. Hence the lesson in regard to the inevitable results of cheap, unskilled supervision which is a common weakness on some quarters.—J. G. Koppell, Electrical Superintendent of Bridges, C.P.R., Sault Ste Marie, in Railway and Locomotive Engineering.

Handling of Railway Service Telegrams and Mailgrams on the Canadian Pacific Railway.

By G. W. Carter, Chief Clerk to District Baggage Agent, Canadian Pacific Railway, Calgary, Alberta.

The telegraph service should be used in cases where immediate action is necessary, and when there is not sufficient time to write and receive answers by mail. While business should never be lost for the sake of not sending a telegram, every care should be taken to keep the wires free from unnecessary encumbrance. When preparing a telegram, full and precise particulars should be briefly given so that further use of the wires will not be required. In many cases officials authorized to send service telegrams include words which could without altering the sense of the telegram be eliminated, for example, words like "please" and "kindly." The clerks in charge of our offices should make periodical examinations of the handling of service telegrams under their supervision and inaugurate a system that will tend to relieve the unnecessary loading of the wires.

I would suggest that the classification of service telegrams be discussed. In my opinion the service telegram should be divided into three classes, telegrams pertaining to accidents and other important subjects should take precedence over all others and be prefixed in a manner to indicate their importance. Other telegrams which require immediate transmittal over the wires should have a secondary prefix. The third class of telegrams are those which can be forwarded by train enclosed in the pink envelopes, known as mailgrams. The officials of the telegraph department who are authorized to classify telegrams should take exception to any, which in their opinion could have been carried by passenger train and delivered in time to receive attention at destination, and report each case to the head of the offending department, attaching copy of the telegram to their report. They should also be instructed to be on guard against the slipping through of telegrams of a personal character under the guise of service telegrams.

One step toward the relief of the telegraph service, is the system of handling telegrams by passenger trains, which is known as mailgrams, and which should be more strictly adhered to. Without doubt the use and value of the mailgram envelope as a means of promoting prompt delivery has been lost sight of for some years and little, if any, attention has been given to this method of handling service telegrams. Urgent telegrams relating to company's business, may often be taken to their destination by train and delivered in reasonable time to receive attention providing there be no delay in the local delivery of them. The special color and marking of the mailgram envelope should indicate to agents and others that the prompt delivery of the mailgram after it has left the train is imperative.

The question of handling railway service telegrams by passenger trains over western lines was discussed with the Vice President and it is his wish that every effort be made to use the train service to the best advantage and in consequence a schedule was drawn up by the General Superintendent of the Telegraph Department, at Winnipeg, showing the time and places for which telegrams must be forwarded by mail. The schedule drawn up covers the whole western lines and the question for discussion is, whether it can be relied upon with the guarantee that telegrams sent by train will receive special attention en route.

Another point for discussion is the recording of the mailgram in order to place the

responsibility of delays. In my opinion the envelope itself if revised would serve the purpose, squares on the right hand margin of the envelopes could be provided in order that initials of employees handling the mailgrams could be shown, the time, date and train could also be recorded on the envelope and if delay occurred the envelope could be held and filed. The handling of mailgrams at points where mail rooms are in operation is another point for general discussion. In my opinion arrangements could be made to suit the local conditions. If instructions were issued to the mail clerks to deliver all mailgrams to the various departments immediately after the arrival of each train it would assist in the quick dispatch. All agents at small points where mail rooms are not in operation should be instructed to see that the mailgrams are delivered to the addressee immediately after the departure of the train on which they arrive. The mail clerks at terminal points should record the mailgrams in a book provided for that purpose, and in the event of a delay should be in a position to give the receiving record to the mailgram, also the time delivered to the telegraph department. The importance of legibly addressing the mailgrams and completing the envelope according to its heading, should not be overlooked, as when this is not done it tends to delay the mailgram, thus impairing its efficiency.

The foregoing paper was read at a meeting of Chief Clerks of the Alberta Division, Canadian Pacific Ry., at Calgary, and a discussion on it was led by J. Stevenson, Chief Clerk to Claims Agent, Calgary. The following recommendations were adopted:—That attention be drawn to the instructions regarding the elimination of unnecessary words in telegrams. The chief clerks should use very sparingly the word "Rush" on telegrams. Pink envelopes should not be used except where it is desired that enclosures receive as prompt attention as wired messages. Where a reply by wire is required, the mailgram should so state. That attention be drawn to the schedule for handling messages by mail issued by the General Superintendent of Telegraphs in Jan. 1914.

Eastern Canadian Passenger Agents Association's Officers, Etc.

At the Association's meeting in Montreal, Jan. 11, the following were elected for this year:

Chairman.—G. H. Clark.

Executive Committee.—W. H. Snell (chairman), R. L. Fairbairn, W. S. Cookson, J. F. Pierce.

Rules Committee.—W. Maughan (chairman), C. W. Johnston, R. L. Fairbairn, J. W. Hanley, G. C. Martin, N. Mooney, L. W. Landman, H. H. Melanson, F. T. Grant.

General Baggage Agents' Committee.—J. O. Apps (chairman), G. C. Allen, R. L. Fairbairn, J. F. Pierce, J. E. Quick, H. P. Dearing, W. M. Skinner, G. H. Clark, A. E. Plumer.

Secretary.—G. H. Webster.

C.P.R. Employees' War Contributions.—By a contribution of \$1,000 to the Toronto and York County Patriotic Fund Association, for December, the C.P.R. Ontario Division employees' contributions to it have reached \$3,500 in three months.

Traffic Orders by the Board of Railway Commissioners.

Freight Charges on Ties to Pas.

24541. Dec. 9. Re application of D. D. Campbell, claims agent, Winnipeg, on behalf of H. H. Blackburn, for adjustment of freight charges on 18 cars of ties from Bannock, Sask., to Pas, Man: Upon hearing the application at Winnipeg, Dec. 1, 1915, in presence of counsel for the Canadian Northern Ry., the applicant appearing in person, it is ordered that the application be refused.

Minimum Weights on Lumber.

24550. Dec. 13. Re application of R. H. H. Alexander, of Vancouver, for an order postponing the effective date of the item on pg. 4 of C.P.R. Supplement 59 to Tariff C.R.C. W-1806, providing for a minimum of 35,000 lbs. on fir, spruce, hemlock, and common cedar lumber, and articles taking lumber rates, in cars under 36 ft. long, and continuing the minimum provided for in Supplement 58 to said tariff: It is ordered that the effective date of the said item, namely, Dec. 15, be postponed until further order.

Lake Erie & Northern Standard Freight Tariff.

24600, Dec. 28, 1915. The application for Lake Erie & Northern Ry., under sec. 327 of the Railway Act, for approval of its Standard Freight Tariff, C.R.C. 1: It is ordered that the said tariff be approved.

Montreal and Southern Counties Standard Freight Mileage Tariff.

24626, Jan. 5. The application of Montreal and Southern Counties Ry., under sec. 327 of the Railway Act, for approval of its proposed Standard Freight Mileage Tariff C.R.C. 5, cancelling C.R.C. 1, approved by order 21566, April 1, 1914, it is ordered that the said tariff be approved, to become effective Jan. 15, and that order 21566 be rescinded.

Express Rates on Fish.

24628. Jan. 10. Re application of Canadian Fisheries Association, of Montreal, and the W. J. Guest Fish Co., of Winnipeg, for an order suspending certain schedules of express companies by which it is proposed to make the rates on fish, in carloads, exclusive of cartage: It is ordered that the following tariffs, viz.: Dominion Express Co., Supplement 11 to Tariff C.R.C. 4418; Supplement 8 to Tariff C.R.C. 4437; Canadian Express Co., Tariffs C.R.C. 1683, 1684, 1685, 1686, Supplement 2 to Tariff C.R.C. 1622; Canadian Northern Express Co., Supplement 1 to Tariff C.R.C. 835, Supplement 1 to Tariff C.R.C. 1527, all effective Jan. 15, 1916, be suspended pending a hearing by the Board.

Free Transportation for Live Stock Shippers.

24673. Jan. 22. Re complaint of Executive Boards of Western Live Stock Shippers' Association and Winnipeg Live Stock Exchange against cancellation by Canadian Pacific, Canadian Northern, and the Grand Trunk Pacific Railways, of all free return transportation for live stock shippers west of Port Arthur, to take effect Feb. 1: It is ordered that the following tariffs, effective Feb. 1, 1916, be suspended, pending further order, viz.: Canadian Northern, C.R.C. no. W-899, Grand Trunk Pacific, C.R.C. no. 134, freight; Canadian Pacific, C.R.C. no. W-1902, Grand Trunk Pacific, C.R.C. no. 509, Canadian Northern, C.R.C. no. W-1300, passenger

The G.T.R. Patriotic Association of Toronto has subscribed an additional \$2,000 to the Toronto and York Patriotic Fund, making a total of over \$7,000 subscribed since its organization.

Canadian Northern Railway Construction, Betterments, Etc.

Canadian Northern Ry.—The Board of Railway Commissioners is being asked to approve harbor plans for a spur line through sections 30 and 19, tp. 25, range 17, west of the 3rd meridian, Sask., the plans, etc., for which are deposited in the Land Titles Office at Moose Jaw, Sask.

R. H. Douglas, engineer of the Alberta Department of Railways, is reported to have stated that his recent inspection of work down on the Calgary-Macleod line during 1915, showed that on June 5, when grading was resumed, three miles of grading had been completed between Calgary and High River, and 14.4 miles between High River and Macleod. Since then 29 miles of grading had been completed, involving the shifting of 560,000 cubic yards of material. A further two miles of grading remained to be completed between Calgary and High River.

Canadian Northern Pacific Ry.—M. H. MacLeod, General Manager and Chief Engineer C.N.R., was present at a meeting of the New Westminster City Council, Dec. 24, when the company's plans for its line in the city were under discussion. The plans entail the erection of a station building, at least equal in size to that of the C.P.R., which will be reached by a line from the bridge over the Fraser River to Lytton Square, thence to Front St., down West St. to the old Royal City Hotel and through Chinatown to the site of the old market, where the station will be built. The proposed route will affect the present C.P.R. tracks, and the British Columbia Electric Ry. tracks. Tenants of the houses acquired by the company on the right of way have been notified to vacate the premises immediately. The work of bricklaying and station building will, it is expected, be gone on with during this year.

Vancouver Terminals.—M. H. MacLeod, General Manager and Chief Engineer, C.N.R., is reported to have said, in an interview at Vancouver recently, that while the company had prepared plans for its own station and terminals on the False Creek property, it had also prepared plans for a combined station building and terminal facilities with the Great Northern Ry. Negotiations were in progress between the two companies and a satisfactory solution was anticipated. Up to the present time the Vancouver City Council has not favored a joint plan, but has been calling upon the two companies to provide the facilities set out in their separate agreements for the reclamation and development of the False Creek property.

Ferry Connection with Vancouver Island.—M. H. MacLeod, General Manager and Chief Engineer, C.N.R., and A. Angstrom, Naval Architect, C.N.R., spent some time recently at the Pacific Coast in connection with the car ferry section of the line. Mr. MacLeod is reported to have said it was hoped to have the first car ferry on the route some time during next summer. It would be operated from New Westminster pending the completion of the line to the proposed ferry terminal on Lulu Island. The completion of this line involves the building of a bridge across the north arm of the Fraser River, and the laying of track to mileage 5.42 from New Westminster bridge, whence track is at present laid to Steveston. The ferry slip will be located at Woodward on Lulu Island. It is about 45 miles from this point to Patricia Bay, where the slip on Vancouver Island will be located. It is expected that construction will be started on

these two ferry slips at an early date.

Vancouver Island Lines.—Track laying is reported to have been started at Victoria on the lines to Patricia Bay, but it is said to have been delayed owing to the non-delivery on time of the diamond for the crossing of the British Columbia Electric Ry. The diamond is now said to have been delivered Jan. 10.

In connection with the Selkirk Water reclamation project, in which the Victoria City Council is interested, a settlement was effected Jan. 4, with the C.N.P. Ry., as to its bridge. In April, 1914, the city decided to oppose the company's application for approval of a temporary trestle, and to ask the Dominion authorities to order the building of a permanent bridge of steel or concrete with spans of not less than 50 ft. The city maintained their attitude to Oct., 1915, when, after some negotiations a compromise was arranged. The terms of the compromise were reported to the council by the Selkirk Water Reclamation Committee, Jan. 4. Under its terms a trestle bridge will be built; to be filled in within certain specified limits, the work to begin within seven years, and to be completed within one year after commencement. On other sections steel spans on concrete piers are to be erected, and a navigation span of 70 ft. is to be provided. An agreement embodying the terms of settlement was signed Jan. 6. (Jan., pg. 12.)

St. John and Quebec Railway Operation.

The St. John and Quebec Ry. is completed from Gagetown to Centreville, N.B., and is being operated as a part of the Intercolonial Ry., under the management of Canadian Government Railways officials. The argument as to operation provided for the payment of 40% of the gross earnings to the New Brunswick Government, in consideration of it having financed the construction of the line. This arrangement, we are officially advised, worked out so badly from the standpoint of the Dominion Minister of Railways, that notice was given that it would cease at the end of 1915. In order that there may not be any interruption of the service on the line a temporary arrangement has been made under which the Government Railways will retain the entire receipts. This arrangement will continue until the return of the Minister of Railways, from England, when a new contract will be discussed with the New Brunswick Government and directors of the company. The terms of the new agreement will be made retroactive to Jan. 1.

Rates via Rail and Lake Routes.—The Interstate Commerce Commission decided at Washington, D.C., Dec. 30, 1915, that the proposed increased class and commodity rates via rail and lake, lake and rail, and rail, lake and rail routes between points in the New England and the middle Atlantic states, and the west, were not justified, and that the tariffs must be cancelled.

Western Canada Railway Club.—At the monthly meeting in Winnipeg, Jan. 11, E. T. Spidy, Assistant to the General Locomotive Foreman, Canadian Pacific Ry., there, read a paper on the evolution of the locomotive.

The American Wood Preservers' Association held its 12th annual convention at Chicago, Ill., Jan. 18 to 20, when a number of committee reports and individual papers were read and discussed.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, for Western Lines, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$1,206,100	\$921,000	\$285,100	x\$145,400
Aug.	1,192,800	954,000	238,800	x5,900
Sept.	2,014,600	1,358,000	661,600	1,900
	\$4,413,600	\$3,227,000	\$1,186,600	x\$79,300
Decr.	\$ 658,300	\$ 579,000	\$79,300	.....

x Decrease.
Mileage in operation at Sept. 30, 1915, 4,965, against 4,670 at Sept. 30, 1914.

Commencing with October, the figures show the earnings of the entire system, both eastern and western lines.

	Gross Earnings	Expenses	Net Earnings	Increase
Oct.	\$3,678,500	\$2,421,500	\$1,257,000	\$ 537,800
Nov.	3,535,200	2,323,800	1,211,400	618,400
	\$7,213,700	\$4,745,300	\$2,468,400	\$1,156,200
Incr.	\$2,407,400	\$1,251,200	\$1,156,200	.....

The mileage operated during December 1915, was 7,775 against 6,886 in December 1914.

Approximate earnings for December, 1915, \$3,435,600 against \$1,809,000, and for three weeks ended Jan. 21, \$1,514,400 against \$987,600 for same period 1915.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$7,895,375.47	\$5,094,972.25	\$2,800,403.12	x\$978,042.71
Aug.	8,801,451.52	5,359,176.80	3,442,314.72	79,157.62
Sept.	1,279,165.45	5,527,864.81	4,475,300.64	378,252.25
Oct.	13,433,206.88	6,863,750.29	6,579,434.75	3,258,105.79
Nov.	13,351,253.51	6,996,870.48	6,354,413.63	3,710,340.86

	\$53,764,490.30	\$29,842,644.73	\$23,921,865.66	\$6,447,813.21
Incr.	\$ 5,270,327.24		\$ 6,447,813.21	.....
Decr.		\$1,177,485.97		.....

Approximate earnings for Dec. 1915, \$12,580,000 against \$7,321,000 for Dec. 1914, and for three weeks ended Jan. 21, \$5,647,000 against \$4,028,000 for same period 1915.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings of the G.T.R. (including the Canada Atlantic Ry.), the G.T.W.R. and the D.G.H. & M.R., for 1915 compared with those for 1914:—

	1915	1914	Incr	Decr.
G.T.R.	\$39,829,694	\$41,737,370	.....	\$1,916,676
G.T.W.R.	7,876,304	7,215,822	\$670,482	.....
D.G.H. & M.R.	2,877,912	2,567,503	310,409	.....

Totals	\$50,574,910	\$51,510,695	\$ 935,785
--------	--------------	--------------	-------	------------

Approximate earnings for two weeks ended Jan. 14, \$1,847,003 against \$1,523,267 for same period 1915.

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section, 916 miles, for Dec. 1915, were \$744,584 against \$262,683 for Dec. 1914, and the aggregate for six months ended Dec. 31, 1915, \$3,451,310 against \$2,331,683 for same period 1914.

Buckwheat and Corn Flour Westbound Transcontinental Rates.—The Interstate Commerce Commission, at Washington, D.C., Dec. 20, 1915, after a rehearing, found that for the future no higher rates should be maintained by respondent, Atchison, Topeka and Santa Fe Ry. and Southern Pacific Co., on buckwheat flour or corn flour in carloads from producing points in transcontinental groups A to J, inclusive, to California terminals and intermediate points than are contemporaneously maintained on wheat flour in carloads from and to the same points.

The Winnipeg Transportation Social Club decided at its regular meeting, Jan. 17, to change its name to the Winnipeg Traffic Club, and to extend its sphere of operations so as to induce the traffic men in wholesale and retail business as members. Following are officers for the current year: President, A. Syme; Vice President, K. Watson; Secretary, J. P. Galvrey; Treasurer, J. O. Norrie.

The King's New Years Honors for Transportation Men.

Canadian Railway and Marine World for January had gone to press when the King's New Year's honors were announced. It is gratifying that a larger proportion than usual of those who have been selected for distinction by His Majesty are prominent in transportation work, or are closely allied to it. Lord Mersey, well known in connection with Admiralty investigations, has been raised from a baron to a viscount; Sir Thos. G. Shaughnessy, President, Canadian Pacific Ry., and D. A. Thomas, who has several railway projects in Canada, have been created barons; Sir Alex. Henderson, Bart., Chairman of the Great Central Ry. Co. of England, has been created a baron; Arthur A. Booth, Chairman, Cunard Steamship Co., and A. F. Yarrow, the British shipbuilder, who is also interested in Yarrows Ltd., Vancouver, have been created baronets; Collingwood Schreiber, the veteran civil engineer, has been created Knight Commander of the Order of St. Michael and St. George; W. D. Reid, President, Reid Newfoundland Co., John Kennedy, the distinguished harbor engineer, and Brigadier General Alex. Bertram, who performed splendid service as Chairman of the Shell Committee, have each been created a knight bachelor.

The Right Hon. Viscount Mersey.

Lord Mersey, who has been raised from Baron to Viscount, is well known in Canada as having conducted the enquiry into the Empress of Ireland disaster in the St. Lawrence in 1914. He also presided over the Lawrence in 1914. He also presided over Titanic, and has been well known in Admiralty cases, as counsel and judge, respectively, for several years.

The Right Hon. Lord Shaughnessy, K.C.V.O.

Sir Thomas G. Shaughnessy, K.C.V.O., was born at Milwaukee, Wisconsin, Oct. 6, 1853, and entered railway service, July 1869, since when he has been, to Jan. 1879, in Purchasing Department, Chicago, Milwaukee and St. Paul Rd.; Jan. 1879 to Oct. 1882, General Storekeeper, same road; Oct. 1882 to Jan. 1884, General Purchasing Agent, Canadian Pacific Ry., Montreal; Jan. 1884 to Sept. 1885, Assistant to General Manager, same road; Sept. 1885 to Sept. 1889, Assistant General Manager, same road; Sept. 1889 to June 24, 1891, Assistant President, same road; June 24, 1891 to June 12, 1889, Director and Vice President, same road; June 12, 1899 to date, President, same road, and from May 9, 1910, also Chairman of the company. Amongst a number of public positions held by him are places on the directorates of the Bank of Montreal, Royal Trust Co., and a number of subsidiary and allied companies of the C.P.R. He was a delegate to the International Railway Congress in 1905. He was knighted by the late King Edward in 1901 and created a Knight Commander of the Royal Victorian Order in 1907. He is a Knight of Grace of the Order of St. John of Jerusalem, and holds the decoration of the Order of the Sacred Treasury of Japan of the second class. It is announced that he has selected the title of Baron Shaughnessy of Montreal, Canada, and Ashford, Ireland.

The Right Hon. Lord Faringdon.

Sir Alexander Henderson, who has been raised to the peerage with the title of Baron, is Chairman of the Great Central Ry. of England, and has rendered considerable transportation service during the war.

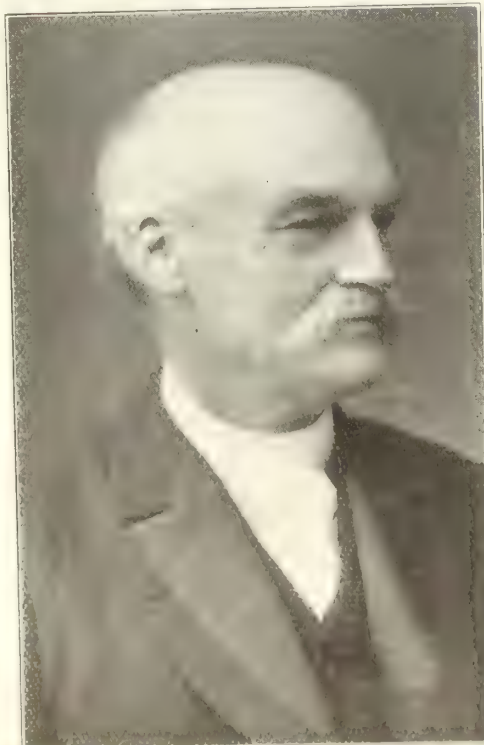
The Right Hon. Lord Rhondra.

D. A. Thomas, who has been created a Baron of the United Kingdom, has been rather intimately associated with Canada

lately in the organization of the Imperial Munitions Board in the Dominion, under the control of the Imperial Minister of Munitions. He has some extensive Can-



The Right Hon. Lord Shaughnessy, K.C.V.O.
President, Canadian Pacific Railway Co.



Sir Collingwood Schreiber, K.C.M.G.
Consulting Engineer, Dominion Government.

adian interests, covering the Athabasca and Fort Vermillion Ry., Pacific Peace River and Athabasca Ry., and the Peace River Tramway and Navigation Co. projects. With his daughter, Lady Mackworth, he was sav-

ed from the s.s. Lusitania, when she was torpedoed by German submarines.

Sir Arthur A. Booth, Bart.

Arthur A. Booth, who has been created a baronet, is Chairman of the Cunard Steamship Line, and has rendered special services during the war in connection with the transportation of munitions, men and war supplies in various parts of the world.

Sir A. F. Yarrow, Bart.

A. F. Yarrow, who has been created a baronet, is head of the well known firm of Yarrow & Co., Ltd., Glasgow, Scotland, and of Yarrows Limited, Vancouver, B.C., and has taken a prominent part in the war in regard to the production of submarines, torpedo boat destroyers, etc., and recently established an experimental tank at the National Physical Laboratory in England, for the elucidation of propeller problems, for the use of any shipbuilder.

Sir Collingwood Schreiber, K.C.M.G.

Collingwood Schreiber, C.M.G., Hon. M. Can. Soc. C.E., who has been created a Knight Commander of the Order of St. Michael and St. George, was born in Essex, Eng., Dec. 14, 1831, and came to Canada in 1852. In that year he was engaged on the Toronto and Hamilton Ry.'s engineering staff and continued in that service until the completion of the road in 1856. From 1856 to 1860 he was in private engineering practice as a partner in the firm of Fleming, Ridout and Schreiber, at Toronto; 1860 to 1863, Superintending Engineer, Northern Ry.; 1863, Division Engineer for the Nova Scotia Government's Pictou Ry., and remained in charge of the work until its completion in 1867. He was subsequently connected with the Intercolonial Ry., first in charge of the surveys for the route by way of Lake Temiscouata, and then in charge of the Eastern Extension Ry., as Superintending Engineer in 1869, and afterwards as Superintending Engineer and Commissioners' Agent for the entire road: 1873 to 1880, Chief Engineer and General Manager of railways operated by the Dominion Government, succeeding the late Sir Sandford Fleming as Chief Engineer, Canadian Pacific Ry., in 1880; 1892 to 1905, Chief Engineer and Deputy Minister, Department of Railways and Canals. Since July 1, 1905, he has been Consulting Engineer to the Dominion Government, and Chief Engineer, Western Division, National Transcontinental Ry. He was appointed a member of the Royal Commission on Railways in 1886, and was created a Companion of the Order of St. Michael and St. George in 1893. He is a member and one of the founders of the Canadian Society of Civil Engineers, of which he was a councillor in 1887 and 1888, and was made an honorary member in 1909.

Sir William Duff Reid.

William Duff Reid, who has been created a knight bachelor, is the eldest son of the late Sir Robert G. Reid, the founder of the Reid Newfoundland Co. He was born in Australia, March 20, 1867, and came to Canada with his parents in 1871. He was associated with his father in the construction of a section of the Canadian Pacific Ry. north of Lake Superior, and also in the construction of the C.P.R. bridge over the St. Lawrence River at Lachine, Que. As a contractor on his own account, he built a portion of the C.P.R. Atlantic Branch and the Intercolonial Ry. bridge from the stationery to Grand Narrows, N.S. He was subsequently, in conjunction with his father, engaged in the construction and operation of the

steam and electric railways in Newfoundland, and steamships connecting with the main land, owned by the Reid Newfoundland Co., of which he became Vice President and General Manager, and on his father's death in 1908, President.

Sir John Kennedy.

John Kennedy, Hon. M.Can.Soc.C.E., who has been created a knight bachelor, is the eldest son of the late Wm. Kennedy, founder of the manufacturing firm of Wm. Kennedy and Sons Co., Owen Sound, Ont. He was born at Spencerville, Ont., in 1838, and was educated privately, at Bytown High School and McGill University. He commenced his engineering career in 1853, under the late T. C. Keefer, and assisted in the construction of water works at Montreal and Hamilton, and also in railway and other engineering works. He was appointed Assistant City Surveyor of Montreal in 1863, and subsequently Deputy City Surveyor, resigning in 1867 on his appointment as Manager of the Hull Iron Mining and Manufacturing Co.'s smelting works at Ironside, Que. In 1871 he was appointed

was also a member of the Royal Commission appointed the same year to enquire into the causes of floods in Montreal and to suggest remedies therefor. He was also a member of the Royal Commission appointed in 1888 to report upon the advisability of completing the Trent Valley Canal system, and has often been called upon to act as arbitrator or consulting engineer on important questions relating to railways, waterways, etc. He was one of the founders of the Canadian Society of Civil Engineers in 1887, and was a councillor during several years, Vice President in 1887, 1890 and 1891; President in 1892, and was elected an honorary member in 1907. He is also a member and councillor of the Institute of Civil Engineers, England, and a member, since 1875, of the American Society of Civil Engineers. Sir John and Lady Kennedy celebrated the 50th anniversary of their wedding in August, 1915.

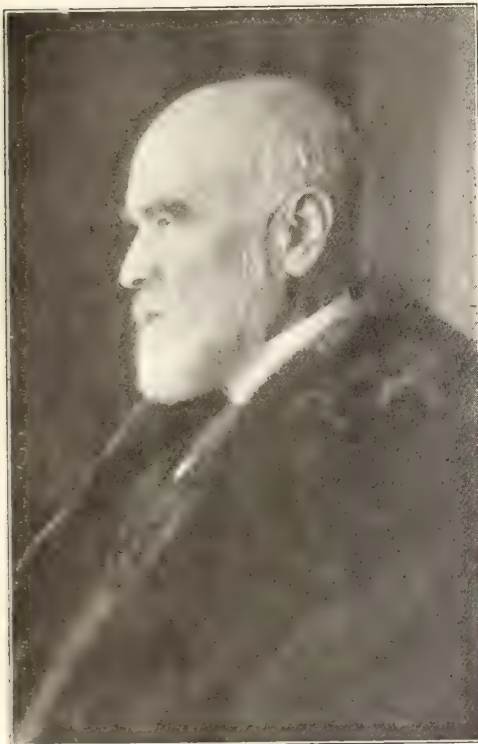
Brigadier General Sir Alexander Bertram.

Brigadier General Alexander Bertram, who has been created a knight bachelor, is the second son of the late John Bertram, one of

Munitions Board, under Imperial control, he was appointed Deputy Chairman. He is included among the transportation men, in this article, on account of having been so intimately connected with them in supplying machinery for railway, locomotive, car and ship building shops.

Railway Profiles to be Based on Mean Sea Level.

The Board of Railway Commissioners passed the following general order 156 Jan. 18:— Re proposal that the profiles of railway companies where lines commence, terminate, or intersect with any of the lines listed in the work entitled *Altitudes in Canada*, hereinafter referred to as "*Altitudes*," edited by James White, Assistant to Chairman and Deputy Head of the Commission of Conservation, including the lines of the said companies which touch tidewater, be based upon mean sea level as provided in *Altitudes*: Upon reading what is filed on behalf of the Canadian Pacific, Canadian Northern, Grand



Sir John Kennedy, Hon.M.Can.Soc.C.E.

Division Engineer on construction, Wellington, Grey and Bruce Ry., and subsequently became Chief Engineer, Great Western Ry., as such building the Canadian Air Line and some minor branches, all of which now form part of the G.T.R. He also laid the first double track line in the Dominion, between Glencoe and Windsor, resigning in 1875 on his appointment as Chief Engineer, Montréal Harbor Commissioners, which position he held until Feb. 1907, when he became Consulting Engineer. During his occupancy of the position of Chief Engineer, he deepened the ship channel between Quebec and Montreal from 20 to 27½ ft., and designed and carried out all the improvements in the Montreal harbor undertaken in that period. On his retirement the Montréal Harbor Commissioners placed on record their deep sense of his lengthened and devoted service and of his faithful and zealous performance of the same. He was a member of the Royal Commission appointed in 1886 to enquire into the leasing of water power on the Lachine Canal, and



P.447.

Sir William Duff Reid,
President, Reid Newfoundland Co.

the founders of the Canada Tool Works, now known as the John Bertram and Sons Co., Ltd., at Dundas, Ont. He was born at Dundas, Feb. 18, 1853, and was educated there. He joined his father in the business, and was admitted a partner in 1886. He has been, for several years, connected with military matters, and was at one time in command of the 77th Wentworth Regiment. He was transferred to the Reserve of Officers in Jan. 1905, and in December of that year was appointed to a command in the 3rd Infantry Brigade; was appointed Colonel in 1910, after having commanded the Canadian Bisley team in the previous year, and has received the Colonial Auxiliary Forces officers' decoration. On the outbreak of the present war he was appointed Chairman of the Dominion Government Shell Committee, which had the handling of the organization of the manufacture of shells and ammunition, and on the recent reorganization of that board, in the course of which it became the Imperial



P.448.

Sir Alexander Bertram.

Trunk Pacific, and Grand Trunk Railway Companies, the said companies consenting to the proposal, and the report and recommendation of the Board's Chief Engineer, it is ordered that, on or before February 1, 1916, all railways of companies which commence, terminate, or intersect any of the lines listed in *Altitudes*, as well as those which touch tidewater, be based upon mean sea level as provided in *Altitudes*.

Grand Trunk Ticket Clerk Convicted.—W. A. Mason, a ticket clerk at the G. T. R. city ticket office, Toronto, who was found guilty recently of the theft of \$1,500 from the company, obtained by issuing tickets for distant points and marking the stubs for points close in, was sentenced, Jan. 5, to 2 years in Kingston penitentiary.

Toronto Union Station Damaged.—A fire starting in the C.P.R. filing room, on the top floor of the office section of this station, on Jan. 10, did about \$15,000 worth of damage.

Mainly About Railway People Throughout Canada.

P. G. Bromley, at one time agent C.P.R., Boissevain, Man., and afterwards travelling auditor, died at Forest, Ont., Jan. 9.

Nelson Main, an inspector on the Intercolonial Ry., was run over by a travelling crane, Jan. 4, and had both legs amputated, lying shortly after.

Paul J. Myler, Vice President, Canadian Westinghouse Co., Ltd., Hamilton, Ont., has been elected a director of the Bank of Toronto.

Sir William D. Reid, President, Reid Newfoundland Co., accompanied by his family, and F. Rioux, his assistant, left St. John's, Nfld., Jan. 9, for Montreal.

W. H. Stewart, Assistant Superintendent, District 1, Eastern Division, C.P.R., Farnham, Que., has been loaned to the Imperial Munitions Board, Ottawa.

Wm. Jarman, who died in Toronto, Dec. 28, aged 80, was employed in the Grand Trunk Union Station ticket office, Toronto, for over 30 years, retiring about 15 years ago.

Geo. D. Perry, General Manager, Great North Western Telegraph Co., left Toronto Jan. 17, for Bermuda, intending to return about the middle of February.

J. J. Hill, of the Great Northern Ry., St. Paul, Minn., has contributed \$5,000 to the fund for a women's residence at Regina College, Sask.

Bion J. Arnold, consulting engineer, Chicago, has been asked by the grade crossing commission of Syracuse, N.Y., to examine and advise upon plans adopted for the elimination of grade crossings there.

Miss Dorothy Gutelius, daughter of **F. P. Gutelius**, General Manager, Canadian Government Railways, was married at Moncton, N.B., Jan. 5, to Dr. Duncan A. Campbell, of North Bay, Ont.

Hugh Sutherland, General Executive Agent, and **M. H. MacLeod**, General Manager and Chief Engineer, Canadian Northern Ry., Winnipeg, visited the company's headquarters in Toronto in January.

E. H. Wood, formerly Division Car Foreman, Ontario Division, C.P.R., Toronto, who resigned in Sept., 1915, is now General Car Foreman, Michigan Central Rd., Chicago, Ill.

T. H. White, M.Can.Soc.C.E., Chief Engineer, Canadian Northern Pacific Ry., Vancouver, B.C., spent some time in Toronto in January, conferring with the President, Vice President and other C.N.R. officials.

J. G. Sullivan, Chief Engineer, Canadian Pacific Ry., read a paper on the Rogers Pass tunnel construction before the Canadian Society of Civil Engineers in Montreal, Jan. 13.

H. H. Vaughan, formerly Assistant to Vice President, Canadian Pacific Ry., and since April 1915 Consulting Engineer, C.P.R., and President, Montreal Ammunition Co., has been elected a director and a Vice President of the Dominion Bridge Co., Ltd.

T. A. Hiam, private secretary to Sir Donald Mann, Vice President, Canadian Northern Ry., is taking a training course with the Canadian Engineers in Toronto, prior to entering the Canadian Expeditionary Forces for overseas service.

Colonel Lyons Biggar, who has been appointed Director General of Transports and Supply, is a brother of **W. H. Biggar, K.C.**, General Counsel, G.T.R., and Vice President and General Counsel, Grand Trunk Pacific Ry., Montreal.

The tower and chime of bells, given to

Grace Church, Brantford, Ont., by Lieut.-Col. **R. W. Leonard**, ex-Commissioner, National Transcontinental Ry., in memory of his parents, were dedicated there, Jan. 9. Their total cost was about \$45,000.

Westropp Armstrong, latterly Bridge Engineer, Toronto-Hamilton Highway Commission, formerly of Mackenzie, Mann & Co.'s engineering staff, and now a captain in the 86th Machine Gun Battalion, was married at Hamilton, Ont., recently to Miss Colquhoun.

Irving R. Todd, Fredericton, N.B., resigned as President of the St. John and Quebec Ry. Co., Dec. 31. The reason given was that the condition of his health, and the pressure of private business rendered it necessary.

A. B. Ingram, Vice Chairman, Ontario Railway and Municipal Board, has been elected Second Vice President, Ontario Safety League. **D. B. Hanna**, Third Vice President, Canadian Northern Ry., has been elected Third Vice President of the League.



E. W. Beatty, K.C., Vice President and General Counsel, Canadian Pacific Railway.

J. W. Crane, formerly Chief Dispatcher, Canadian Northern Ry., Saskatoon, Sask., was presented recently with an arm chair and humidor, by his associates there, on leaving for Kamloops, B.C., where he has been appointed Chief Dispatcher, Pacific Division, C.N.R.

Lt.-Col. J. J. Creelman, of the 2nd Brigade, Canadian Field Artillery, 1st Division, Canadian Expeditionary Forces, and son of A. R. Creelman, K.C., one of the C.P.R. directors, returned to Montreal at the end of December from France, on six weeks leave of absence.

Dr. J. A. Hutchison, Chief Medical Officer, G.T.R., Montreal, is mentioned as Chairman, with the temporary rank of Lieutenant-Colonel in the Army Medical Corps, of the newly appointed medical board for the 4th Division, for the examination of army pensioners.

W. B. Lanigan, Assistant Freight Traffic

Manager, Western Lines, C.P.R., was the principal speaker at a recruiting meeting at the Royal Alexandra Hotel, Winnipeg, recently. The audience consisted entirely of members of the various C.P.R. office staffs in the city.

Capt. R. Falshaw Morkill, Signal Engineer, Grand Trunk Ry., now of the 34th (Norfolk) Divisional Royal Engineers, wrote from Sutton Veny Camp, Wiltshire, Eng., Dec. 25, to E. W. Oliver, of Mackenzie, Mann & Co.'s engineering staff, Toronto, that he expected to leave for Egypt two days later.

N. P. Dalziel, formerly of Mackenzie, Mann & Co.'s engineering staff, Toronto, who is a provisional lieutenant (supernumerary) in the Canadian Engineers, has been gazetted recently as having been seconded on Sept. 14, 1915, while employed as an assistant inspector of steel.

Thos. Gibson, a Toronto solicitor, formerly President, Lake Superior Corporation, among the subsidiaries of which are the Algoma Central & Hudson Bay Ry., the Algoma Eastern Ry., and the Algoma Central Steamship Co., has given up his practice to become Major in the 168th Oxford Battalion, Canadian Overseas Expeditionary Forces.

W. L. Donaldson, who was appointed Assistant General Freight Agent, Lehigh Valley Rd., Buffalo, N.Y., recently, began railway service in 1898, and served in various capacities in the freight department, G.T.R., Wabash Rd. and Chicago and North Western Ry., entering Lehigh Valley Rd. service in 1906.

A. P. Giles, who has retired from the position of Roadmaster, Intercolonial Ry., Newcastle, N.B., under the provisions of the pension rules, was presented with an address and a purse of money, Jan. 4. He had been in the Government railway service for 35 years, the last five of which were spent at Newcastle, N.B.

E. A. Lancaster, M.P., who died at St. Catharines, Ont., Jan. 4, after a lengthened illness, aged 55, was for several years Chairman of the Railway Committee of the House of Commons. During his membership of the House he was chiefly responsible for legislation dealing with cattle guards and level crossings.

L. C. Fritch, Assistant to the President, and General Manager, Eastern Lines, Canadian Northern Ry., Toronto, and **W. McNab**, Valuation Engineer, G.T.R., Montreal, have been appointed members of the committee of arrangements to prepare for the American Railway Engineering Association's annual convention, March 22 to 25, at Chicago, Ill.

Bruce Hosmer Acton Burrows, B.A.Sc., younger son of Acton Burrows, Managing Director, Canadian Railway and Marine World, has been gazetted recently as having been appointed a provisional lieutenant (supernumerary) in the Canadian Engineers on Sept. 15, 1915. He is at the Canadian Engineers Training Depot, Ottawa, preparatory to going overseas.

E. McDonald, who has been appointed General Baggage Agent, Grand Trunk Pacific Ry., and Grand Trunk Pacific Coast Steamship Co., Winnipeg, was from June, 1904, to May, 1910, clerk, General Baggage Agent's office, G.T.R., Toronto, and from May, 1910, to Dec. 31, 1915, District Baggage Agent, G.T.P.R. and G.T.P. Coast Steamship Co., Winnipeg.

M. K. Cowan, K.C., of Toronto, formerly of the Grand Trunk Legal Department, Montreal, collapsed suddenly in the Board

of Railway Commissioner's offices at Ottawa, Jan. 25, owing, it is said, to acute indigestion. He was taken to St. Luke's Hospital there, where he recovered consciousness, and it was stated later in the day that he was not seriously ill.

Andrew Ledingham, who has been appointed City Freight Agent, C.P.R., Winnipeg, was born at Blackford, Scotland, Sept. 29, 1884, and entered C.P.R. service, Jan. 1, 1911, since when he has been, to Jan. 1, 1913, chief clerk to Assistant Freight Traffic Manager, Winnipeg; Jan. 1, 1913, to Jan. 1, 1916, Contracting Freight Agent, Winnipeg.

Barton Wheelwright, who has been appointed acting Signal Engineer, G.T.R., Montreal, was born at Minneapolis, Minn., Mar. 12, 1888, and entered G.T.R. service, July 1, 1911, since when he has been, to Mar. 1, 1912, draughtsman on grade separation, Toronto; Mar. 1, 1912, to Dec. 1, 1914, Block Signal Inspector, Montreal; Dec. 1, 1914, to Jan. 14, 1916, Assistant Signal Engineer, Montreal.

Lieutenant H. F. H. Hertzberg, Jr., M.Can. Soc.C.E., of the Royal Canadian Engineers, who is on active service in Europe, and who has been promoted to the rank of Captain, is a son of A. L. Hertzberg, M.Can. Soc.C.E., Division Engineer, C.P.R., Toronto, and was formerly with the Trussed Concrete Steel Co. of Canada, Walkerville, Ont. This item appeared in the January issue, but owing to typographical errors in the names, is repeated.

Thos. Malcolm, railway contractor, whose latest work was building the International Ry. of New Brunswick, of which company he was President until he sold the line to the Dominion Government, is ill at his home, Campbellton, N.B. He left there Nov. 28 for New York, where he was operated upon on Dec. 6 for obstruction of the pylorus, and progressed satisfactorily until Dec. 21, when complications occurred and he was taken home in the middle of January, accompanied by Mrs. Malcolm, a doctor and a nurse.

Arthur Tilley McKean, who has been appointed Division Freight Agent, C.P.R., Winnipeg, was born at St. John, N.B., Dec. 18, 1886, and entered C.P.R. service, Apr. 1, 1903, since when he has been, to Mar., 1906, clerk and stenographer, General Freight Department, St. John, N.B.; Mar., 1906, to Jan., 1908, clerk, assistant chief clerk and chief clerk to Assistant Freight Traffic Manager, Winnipeg; Jan., 1908, to June, 1911, Soliciting Freight Agent, Winnipeg; June, 1911, to Jan., 1916, City Freight Agent, Winnipeg.

William James Rennie, who has been appointed Soliciting Freight Agent, C.P.R., Winnipeg, was born at Montreal, Aug. 21, 1886, and entered C.P.R. service, Dec. 5, 1899, since when he has been, to May 31, 1911, office boy, junior clerk and claims clerk, Freight Claims Auditor's office, Montreal; June 15 to Oct. 31, 1911, claims clerk, Division Freight Agent's office, Winnipeg; Nov. 1, 1911, to Jan. 31, 1912, assistant chief clerk, same office; Feb. 1, 1912, to June 30, 1914, assistant chief clerk, Assistant Freight Traffic Manager's office, Winnipeg; July 1, 1914, to Dec. 31, 1915, chief clerk, same office.

Charles Henry Towle, who has been appointed Assistant Superintendent, District 1, Atlantic Division, C.P.R., Brownville Jct., Me., was born at Enfield, Me., Apr. 13, 1878, and entered railway service in Oct., 1893, since when he has been, to Feb., 1894, station baggage master, Maine Central Rd., Enfield, Me.; Feb., 1894, to Aug., 1896, freight brakeman, same road, Bangor, Me.; Aug., 1896, to Dec., 1898, freight brakeman, C.P.R., Brownville Jct., Me.; Dec., 1898, to Sept., 1914, freight conductor, C.P.R., Brownville

Jct., Me.; Sept., 1914, to Nov., 1915, General Yardmaster, C.P.R., McAdam Jct., N.B.

George Arthur Walton, who has been appointed General Passenger Agent, Western Lines, C.P.R., Winnipeg, was born at Montreal on July 17, 1881, and entered C.P.R. service, Sept. 1, 1901, since when he has been, to May 31, 1903, chief rate clerk, Winnipeg; June 1, 1903, to Mar. 31, 1906, chief clerk, Winnipeg; Apr. 1 to Aug. 31, 1906, station ticket agent, Winnipeg; July 15, 1907, to Apr. 14, 1910, District Passenger Agent, Brandon, Man.; Apr. 15, 1910, to Aug. 31, 1911, General Agent, Passenger Department, Spokane, Wash.; Sept. 1, 1911, to Dec. 31, 1915, General Agent, Passenger Department, Chicago, Ill.

Albert G. Albertsen, who has been appointed City Ticket Agent, C.P.R., San Francisco, Cal., was born at Copenhagen, Denmark, Dec. 31, 1887, and entered transportation service in April, 1908, since when he has been, to Nov. 1909, passenger clerk, Thos. Cook and Sons; Nov. 1909 to July 1910, Travelling Agent, International Mercantile Marine Co.; July 1910 to Mar. 1911, passenger and ticket clerk, Pacific Mail Steamship Co.;



G. A. McNicholl,
Assistant General Freight and Passenger Agent,
Grand Trunk Pacific Railway.

Mar. 1911 to May 1912, City Passenger Agent, C.P.R.; May 1911 to Jan. 1916, Travelling Passenger Agent, C.P.R., all at San Francisco, Cal.

T. J. Wall, who has been appointed General Agent, Passenger Department, C.P.R., Chicago, Ill., was born at St. Louis, Mo., Sept. 10, 1882, and was, to July 1, 1908, Station Passenger Agent, Pennsylvania Lines, St. Louis, Mo.; July 1, 1908, to Feb. 1, 1911, Travelling Passenger Agent, C.P.R., St. Louis, Mo.; Feb. 1 to Oct. 1, 1911, City Passenger and Ticket Agent, C.P.R., Chicago, Ill.; Oct. 1, 1911, to June 1, 1914, General Agent, Passenger Department, C.P.R., Spokane, Wash.; June 1, 1914, to Jan. 1, 1916, General Agent, Passenger Department, C.P.R., Minneapolis, Minn.

Fred L. Nason, who has been appointed General Agent, Passenger Department, C.P.R., San Francisco, Cal., was born at Newton,

N.H., Apr. 16, 1880, and entered railway service in June 1898, since when he has been, to Oct. 1902, telegraph operator and ticket agent, New York, New Haven and Hartford Ry., Hyde Park, and Boston, Mass.; Nov. 1902 to May 1903, telegraph operator, Atchafson, Topeka and Santa De Ry., in Arizona; May 1903 to Aug. 1908, telegraph operator and agent, Southern Pacific Co., at various points in California; Aug. 1908 to Jan. 1, 1916, City Ticket Agent, C.P.R., San Francisco, Cal.

Lewis Raymond Hart, who has been appointed General Agent, Passenger Department, C.P.R., Buffalo, N.Y., was born at Fairport, N.Y., June 3, 1877, and entered railway service June 22, 1899, since when he has been, to Jan., 1900, telegraph operator and ticket clerk, New York, New Haven and Hartford Rd., West Quincy, Mass.; Jan. to Sept., 1900, assistant ticket agent, same road, Quincy, Mass.; Sept., 1900, to Dec. 11, 1905, assistant ticket agent, same road, Fall River, Mass.; Dec. 11, 1905, to July 28, 1913, chief clerk, Passenger Department, C.P.R., Boston, Mass.; July 28, 1913, to Jan. 1, 1916, chief clerk, Passenger Department, C.P.R., New York, N.Y.

Frederick William Robertson, who has been appointed District Passenger Agent, Intercolonial Ry., Halifax, N.S., was born at Moncton, N.B., Oct. 10, 1871, and entered I.R.C. service, May 20, 1886, since when he has been, to Aug., 1889, clerk on car mileage; Aug. to Nov., 1889, clerk to Chief Superintendent; Nov., 1889, to Feb., 1891, clerk to General Passenger Agent; Feb. to Apr., 1891, clerk to Chief Superintendent; Apr., 1891, to Nov. 1901, clerk to General Passenger Agent; Nov., 1901, to Sept., 1902, secretary to General Manager; Sept., 1902, to Feb. 4, 1913, secretary to General Passenger Agent; Feb. 4, 1913, to Dec. 1, 1915, chief clerk, all at Moncton, N.B.

George W. Caye, whose appointment as General Purchasing Agent, G.T.R., Montreal, was announced in our last issue, was born at Malone, N.Y., Dec. 1, 1865, and entered railway service, Aug., 1883, since when he has been, to 1897, successively, junior clerk, stenographer and ticket clerk, Passenger Department, Central Vermont Ry., St. Albans, Vt.; 1897 to 1900, chief clerk to General Superintendent, same road, St. Albans, Vt.; 1900 to 1902, Travelling Car Agent, Canada Atlantic Ry., Ottawa, Ont.; 1902 to 1905, secretary to General Manager, same road; 1905 to 1907, chief clerk to Vice President and General Manager, Grand Trunk Pacific Ry., Montreal; 1907 to Dec. 31, 1915, Assistant to Vice President and General Manager, same road, Winnipeg.

George Henry Nowell, whose appointment as District Master Mechanic, District 3, British Columbia Division, C.P.R., Nelson, was announced in our last issue, was born at Montreal, Nov. 13, 1885, and entered railway service, July 2, 1899, since when he has been, to July 2, 1904, machinist apprentice, C.P.R., Montreal; July 2 to Nov. 5, 1904, machinist, C.P.R., Montreal; Nov. 5, 1904 to Feb. 15, 1905, machinist, C.P.R., North Bay, Ont.; Apr. 15 to Sept. 1, 1905, machinist, G.T.R., Montreal; Sept. 1, 1905 to Sept. 30, 1908, machinist, C.P.R., Montreal; Sept. 30, 1908 to Jan. 15, 1910, leading hand, C.P.R., Montreal; Jan. 15, 1910 to Jan. 15, 1913, charge hand, C.P.R., Montreal; Jan. 15, 1913 to Sept. 5, 1915, Erecting Shop Foreman, C.P.R., Ogden, Alta.; Sept. 5 to Dec. 1, 1915, Locomotive Foreman, C.P.R., Cranbrook, B.C.

George N. Goad, who has been appointed Inspector of Transportation, Eastern Lines, Canadian Northern Ry., Toronto, was born there, Nov. 26, 1884, and entered railway service in Sept., 1901, since when he has

February, 1916.]

een, to July, 1902, junior clerk, Division Freight Agent's office, G.T.R., Toronto; July, 1902, to Sept., 1904, stenographer, same office; Sept., 1904, to Dec., 1905, chief clerk, Canadian Freight Agent's office, Lehigh Valley Rd., Toronto; Dec., 1905, to Mar., 1907, stenographer, Third Vice President's office, Canadian Northern Ry., Toronto; Mar., 1907, to Aug. 31, 1915, chief clerk to Superintendent and General Superintendent, C.N.R., Toronto; Sept. 1., to Dec. 31, 1915, chief clerk to General Manager, Eastern Lines, C.N.R., Toronto.

B. T. Chappell, who has been appointed Superintendent, Pacific Division, Canadian Northern Ry., Vancouver, B.C., was born at Charlottetown, P.E.I., May 1, 1878, and entered railway service, Sept., 1895, since when he has been, to 1897, clerk in Freight Department, Northern Pacific Ry., Winnipeg; 1897 to 1901, in train service, same road; 1901, on the taking over of the Northern Pacific lines in Manitoba by the Canadian Northern Ry., to 1903, in train service, C.N.R.; 1903 to 1905, Yardmaster, same road, Port Arthur, Ont.; 1905 to 1907, Trainmaster, District 1, Western Division, same road; 1907 to Jan. 1, 1913, Trainmaster, District 4, Western Division, same road; Jan. 1, 1913, to Nov. 22, 1915, Superintendent, District 2, Western Division, same road, Saskatoon, Sask.

Arthur A. Tisdale, who has been appointed Assistant to Vice President and General Manager, Grand Trunk Pacific Ry., Winnipeg, was born at Mount Vernon, Ont., Mar. 8, 1874, and entered railway service Sept. 18 1889, since when he has been, to July, 1892, in local freight office, G.T.R., Hamilton, Ont.; July, 1892, to May, 1899, secretary to Chief Engineer, Hamilton and Montreal; May, 1899, to Oct., 1907, successively, secretary, chief clerk, and Assistant to Fourth Vice President in charge of Transportation and Maintenance of Way, G.T.R., Montreal; Oct., 1907, to Oct., 1909, Assistant to Vice President and General Manager, Grand Trunk Pacific Ry. Montreal; Oct., 1909, to June, 1915, Superintendent, Lake Superior Division, same road, Fort William, Ont.; June, 1915, to Jan. 1, 1916, Superintendent, Regina Division, same road, Regina, Sask.

E. W. Beatty, K.C., Vice President and General Counsel, C.P.R., who has been elected a director of the company, was born at Thorold, Ont., Oct. 16, 1877. He was educated at the Model School and Harbord Collegiate Institute, Toronto, and the University of Toronto, graduating in 1898. He served his articles with the late D'Alton McCarthy, of McCarthy, Osler, Hoskin and Creelman, Toronto, and was admitted to the bar in 1901. On the appointment of A. R. Creelman, as Chief Solicitor, C.P.R., he accompanied him to Montreal, and was appointed Assistant Solicitor, Jan. 1, 1905; General Solicitor, Mar. 1, 1910; General Counsel, June, 1913, and Vice President and General Counsel, Dec., 1914. He is a son of the late Henry Beatty, at one time Manager of the Upper Lakes Steamships, C.P.R., Toronto, and brother of Dr. H. A. Beatty, Chief Surgeon, Ontario Division, C.P.R., Toronto.

Albert E. Lock, who has been appointed Superintendent of Car Service, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., was born at Albany, N.Y., July 14, 1879, and entered railway service Dec. 1, 1896, since when he has been, to Sept. 1, 1897, telegraph operator and relief agent at various points, Lehigh Valley Rd.; Sept. 1, 1897, to July 1, 1902, tower man, telegraph operator, relief agent, ticket clerk, assistant agent, etc., Mohawk and Adirondack Divisions, New York Central and Hudson River Rd.; July 1, 1902, to Aug. 15, 1903, City Ticket Agent,

same road, Lake Placid, N.Y.; Aug. 15, 1903, to Sept. 15, 1904, Travelling Passenger Agent, New York Central Lines, Saranac Lake, N.Y.; Sept. 15, 1904, to Nov. 1, 1913, Travelling Passenger Agent, New York Central Lines, Montreal; Nov. 1, 1913, to Apr. 1, 1914, Commercial Agent, Toronto, Hamilton and Buffalo Ry., Toronto; Apr. 1, 1914, to Dec. 29, 1915, Car Accountant, same road, Hamilton, Ont.

Frank W. Cooper, A.M.Can.Soc.C.E., who has been appointed Superintendent, District 3, Lake Superior Division, Schreiber, Ont., was born at London, Ont., Feb. 16, 1880, and entered railway service in 1901, since when he has been, to 1903, draughtsman, maintenance of way; and leveller on preliminary location and construction, Algoma Central and Hudson Bay Ry., Sault Ste. Marie, Ont.; June, 1903, to Nov., 1905, transit man and Assistant Engineer, C.P.R., London and Toronto; Nov., 1905, to Nov., 1911, Resident Engineer, C.P.R., London and Toronto; Nov., 1911, to Apr., 1912, Resident Engineer, C.P.R., Montreal; Apr. to Nov.,



The Late Alexander Shields.

1912, Assistant Engineer in Chief Engineer's office, C.P.R., Montreal; Nov., 1912, to Feb., 1915, Division Engineer, Eastern Division, C.P.R., Montreal; Feb. to May, 1915, acting Superintendent, District 1, Eastern Division, C.P.R., Farnham, Que.; May, 1915, to Jan. 8, 1916, Superintendent, District 1, Eastern Division, C.P.R., Farnham, Que.

Harry Parry, who has been appointed Assistant General Passenger Agent, New York Central Rd., and West Shore Rd., Buffalo, N.Y., was born in Hamilton, Ont., and entered railway service in 1883 as a messenger in the Traffic Manager's office, Great Western Ry. there. In 1884 he was stenographer in the rate department, and subsequently served in the freight claims department until the absorption of the G.W.R. by the G.T.R., when he was, from Jan. to Apr., 1885, stenographer, freight claims department, G.T.R., Montreal; Apr. to Sept., 1885, stenographer in General Freight and Passenger Agent's office, Northern and Northwestern Ry., Toronto; Sept. to Dec., 1885, clerk to General Agent, and Assistant City Passenger and Ticket Agent, West Shore Rd., Buffalo, N.Y.; Dec., 1885, to May 27, 1889, Assistant City Passenger and Ticket Agent, New York Central and Hudson River Rd., Buffalo, N.Y.; May 27, 1889, to Mar. 1,

1897, City Passenger and Ticket Agent, New York Central Lines and West Shore Rd., Buffalo, N.Y.; Mar. 1, 1897, to Jan., 1916, General Agent, Passenger Department, same lines, Buffalo, N.Y.

Alexander Shields, Locomotive Inspector, Canadian Northern Ry., Winnipeg, died Jan. 18, at Rochester, Minn., where he had been to consult the Mayo Bros., Surgeons, who decided that it was useless to operate. The body was taken to Winnipeg and thence to Toronto, the funeral taking place from the home of his brother in law, E. W. Hendrick, Jan. 24. He was born at Toronto, June 14, 1867, and entered railway service there in 1880, as apprentice on the Credit Valley Ry., now part of the C.P.R., and from 1886 to 1901, was in the mechanical department, G.T.R., at Port Huron, Mich.; 1901 to 1903, Locomotive Foreman, C.P.R.; 1903 to Jan. 1912, Locomotive Foreman, and Master Mechanic, Canadian Northern Ry., Winnipeg; Jan. to March 1912, General Master Mechanic, C.N.R., Winnipeg. He resigned from the service in March, 1912, on his election as President Railroaders' Investment Co., and a director of the Consolidated Land Co. He returned to Canadian Northern Ry. service during 1915, as Locomotive Inspector. He is survived by a widow and three daughters.

M. G. Murphy, who has been appointed District Passenger Agent, C.P.R., and Canadian Pacific Ocean Services, Ltd., St. John, N.B., was born at Halifax, N.S., Feb. 26, 1878, and entered C.P.R. service Mar. 31, 1899, since when he has been, to Jan., 1901, agent and operator, Atlantic Division; Jan., 1901, to 1903, chief clerk to Freight Agent, C.P.R., and agent, Dominion Express Co., Halifax, N.S.; 1903 to 1905, Travelling Passenger Agent, Atlantic Division; 1905 to June, 1907, Assistant to District Passenger Agent, St. John, N.B.; June, 1907, to Nov. 1, 1910, General Travelling Passenger Agent, Western Lines, Winnipeg; Nov. 1, 1910, to Oct. 1, 1911, General Travelling Passenger Agent, All Lines, Montreal; Oct. 1, 1911, to Jan. 31, 1916, District Passenger Agent, Toronto, covering rail and lake lines as well as ocean services until the organization of Canadian Pacific Ocean Services, Ltd., Jan. 1, when I. E. Suckling was appointed General Agent, Passenger Department, C.P.O.S., Ltd. He is President of the Toronto Transportation Club. On leaving Toronto he was presented with a gold watch by a number of local transportation men, and with a gold watch chain by his office staff.

George Alexander McNicholl, who was appointed Assistant General Freight and Passenger Agent, Grand Trunk Pacific Ry., Prince Rupert, B.C., recently, was born at Montreal, July 31, 1876, and entered railway service Apr. 1, 1889, since when he has been, to Aug. 14, 1891, apprentice, General Auditor's office, G.T.R., Montreal; Aug. 14, 1891 to July 10, 1895, apprentice, Assistant General Manager's office, G.T.R., Montreal; July 10 to Nov. 7, 1895, clerk, General Passenger Agent's office, G.T.R., Montreal; Nov. 7, 1895 to Feb. 22, 1896, clerk, General Manager's office, G.T.R., Montreal; Feb. 22, 1896 to Dec. 15, 1900, clerk, General Traffic Manager's office, G.T.R., Montreal; Dec. 15, 1900 to June 12, 1902, secretary to Second Vice President and General Manager, G.T.R., Montreal; June 12, 1902 to Jan. 1, 1905, chief clerk, Third Vice President, G.T.R., Montreal; Jan. 1, 1905 to Apr. 1, 1907, secretary to Vice President and General Manager, Grand Trunk Pacific Ry., Montreal; Apr. 1, 1907 to July 1, 1910, Purchasing Agent, G.T.P.R., Vancouver, B.C.; July 1, 1910 to Oct. 1, 1913, Superintendent, G.T.P.R., Prince Rupert, B.C.; Oct. 1, 1913 to Nov. 15, 1915, Commissioner of Colonization and Industries, G.T.P.R., Prince Rupert, B.C.

Steam Railway Track Laid in 1915.

The returns received from steam railway companies throughout Canada, in answer to Canadian Railway and Marine World's inquiries, and which were published in our January issue, showed only 547.47 miles of new first track as having been laid in 1915, but as explained in the article, the returns were incomplete, some companies not having reported, and others having sent in figures based on estimates, which needed revision. The full and revised returns are given in the table below, which shows that 714.26 miles of new first track were laid by 15 separate companies, a mileage which, while considerably below that laid in any one year for the past 12 years or so, is in excess of that which it was estimated would be laid. Track laying was somewhat held up owing to the difficulty of placing orders for steel, the mills finding it more profitable to run on steel for shell making and similar purposes. The details for the several companies are as follows:

	Miles.	Miles.
Alberta and Great Waterways.		
Mileage 78 to 174.5, Alberta	96.50	
Canadian Northern System.		
Canadian Northern Quebec—		
Arundel to Rouge River, Que.	2.00	
Canadian Northern—		
Grand Marais to Victoria		
Beach, Man.	14.07	
Canora to Sturgis, Sask.	21.44	
Bienfait to Estevan, Sask.	8.91	
Elrose to Eston, Sask.	34.81	
Canadian Northern Sask. Ry.—		
Wroxton to Willowbrook, Sask.	41.01	
Canadian Northern Western Ry.—		
Camrose southeasterly	43.00	
Canadian Northern Pacific.—		
Gladwin to bridge 4	32.00	
Bridge 5 to bridge 7	8.00	
Hells Gate to Goose Creek,		
mileage 370 to 382	12.00	
mileage 382 to 397	15.00	
	232.24	
Canadian Pacific.		
Coronation, Sask., west	0.75	
Foremost to Pakowki, Alta.	22.30	
	23.05	
Central Canada.		
McLennan to Heart River, Alta.	47.60	
Edmonton, Dunvegan and British Columbia.		
Mileage 246.7 to 336.9	90.20	
Essex Terminal.		
Near Sandwich to Ojibway, Ont.	1.00	
Grand Trunk Pacific.		
Track on Saskatchewan River		
bridge, Prince Albert branch.	0.20	
Halifax South Western.		
Jordan Falls Station to Jordan		
Falls, N.S.	1.29	
Hudson Bay (Dominion Government).		
Mileage 197.4 to 241.24	43.84	
Intercolonial.		
Connection with National Trans-		
continental, Moncton	0.85	
Dartmouth branch—Edenbrook		
to Upper Musquodoboit, N.S.	17.00	
	17.85	
Kettle Valley Lines.		
Between Midway and Merritt,		
B.C.	31.00	
Coquihella River Section	33.00	
	64.00	
Pacific Great Eastern.		
D'Arcy to Clinton, B.C.	81.20	
Quebec Central.		
From mileage 5 east of St. Ca-		
mille to English Lake	14.00	
St. John and Quebec.		
From Fredericton, N.B., south.	1.29	
Total	714.26	

The mileage laid in the several provinces in comparison with that laid in 1914 was:—

	1915.	1914.
Alberta	299.60	513.12
British Columbia	212.20	679.26
Saskatchewan	107.12	215.97
Manitoba	57.91	300.15
Nova Scotia	18.29	47.80
Quebec	16.00	52.51
New Brunswick	2.14	29.99
Ontario	1.00	200.01
Prince Edward Island		2.50
Miles	714.26	2,041.31

Several United States publications have published tables in which considerable differences occur. The Railway Review gives

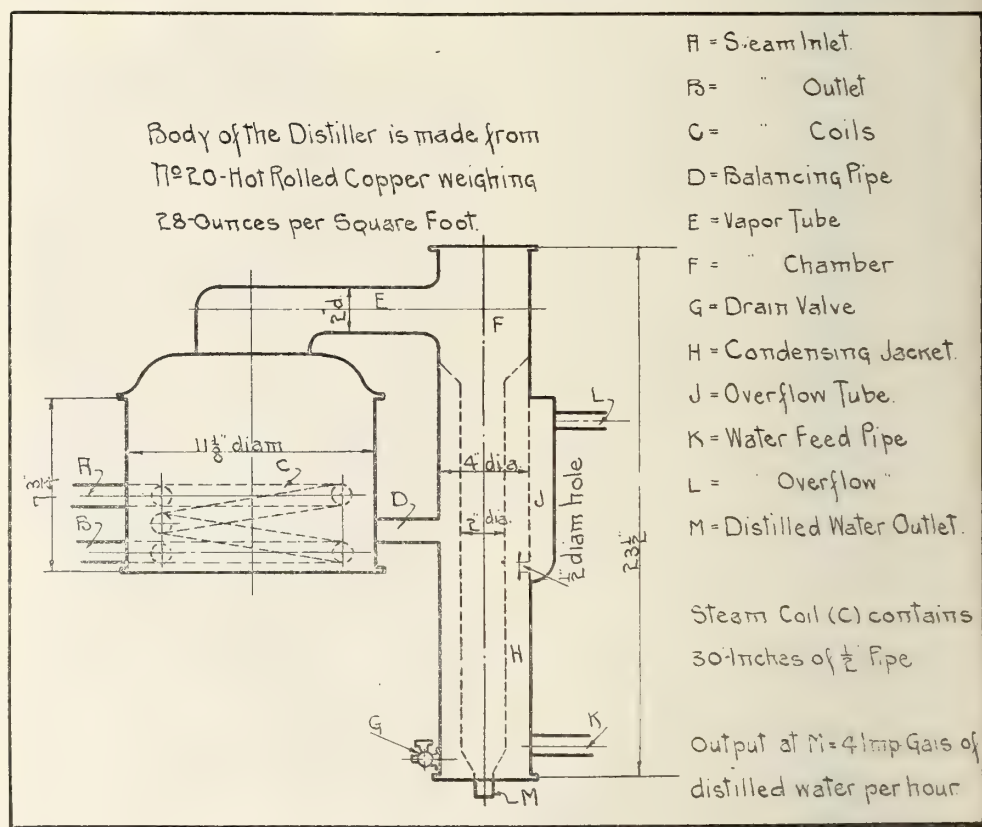
585.10 miles and the Railway Age Gazette 718.37 miles, the latter mentioning 15 railways. An examination and comparison of these figures with our returns for 1915 and 1914, shows that the Railway Age Gazette includes 14.81 miles on the Dominion Atlantic, which was included in our 1914 table; and omits to include the Halifax and South western, the St. John and Quebec, and the Intercolonial's Dartmouth Branch. Among other figures in the Railway Age Gazette's table which do not agree with the returns we have received, are the following:—It gives track as having been laid on the Canadian Northern south easterly from Camrose, Alta., for 60 miles, while we are advised that only 43 miles had actually been laid at the time of our report. It gives the Canadian Northern Pacific as having laid 22 miles, while our figures were held over as the reports we had received did not fit in with previous reports; the figures given in our

official statement only reached us Jan. 19. The other differences between the two reports are fractional.

A Simple Water Distiller.

The accompanying plan represents one of the simplest and yet most effective styles of water distilling outfits yet devised. Being a small apparatus and of simple construction with a capacity of four imperial gallons of distilled water per hour, it meets the ordinary requirements of most storage battery plants, especially those pertaining to railway car lighting service.

Water is supplied through the $\frac{1}{2}$ inch pipe K and fills tube H, which forms a condensing jacket around vapor chamber F. The water in the condensing jacket H rises to the level of balancing pipe D, at which point it enters the main drum in which is located the steam coil C. Approximately 30 ins. of $\frac{1}{2}$ -in. radiating pipe is provided and connected to inlet A and outlet B. By ab-



A Simple Water Distiller.

table are the actual mileages laid in 1915, the figures given in 1914 having been made up in the company's office from progress reports and estimates of what it was expected to do. It gives the entire length of the Central Canada to Peace River Landing, 50 miles, while track had been laid for 47.50 miles, and will not be laid further until the completion of the bridge over Heart River. The track laid on the Edmonton, Dunvegan and British Columbia is placed by the Railway Age Gazette at the round figure of 100 miles, while our revised report shows only 90.20 miles to have been laid. The other important difference is on the Pacific Great Eastern, in regard to which in 1914 we estimated track to have been laid to mileage 120, near Lillooet, that being the objective point for the year, but track end did not reach beyond D'Arcy, in 1914, and reached Lillooet in the spring, the 46 miles estimated in our January issue as having been laid in 1915, being laid in the autumn. The company's

sorbing sufficient heat from the coils, the water forms into vapor and passes through the vapor tube E into chamber F, where it is condensed by the cooling action of water jacket H and passes out of connection M. In case water is forced under pressure through feed pipe K at too great a rate, it is fed back through the $\frac{1}{2}$ -in. hole in condensing jacket to overflow tube and from thence out through the $\frac{3}{8}$ -in. overflow pipe, the latter being located so that not more than an inch of water may stand over the top surface of the steam coils C.

The body and tubes of the distiller are made from no. 20 hot rolled copper weighing 28 oz. per sq. ft. There are quite a number of these distillers in service, the Canadian Northern Ry. having adopted it for train lighting storage battery plants. The original design was developed by E. Lindelius, Superintendent, Preston Car & Coach Co., Preston, Ont., to whom we are indebted for the above data.

February, 1916.]

Canadian Railway AND Marine World

ESTABLISHED 1898

Devoted to Steam and Electric Railway,
Marine, Express, Telegraph, and Railway and
Canal Contractors' Interests.
Official Organ of the various Canadian
Transportation Associations.
Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C.E.,
Managing Director and Editor-in-Chief.
AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editor - **JOHN KEIR**
Associate Editor - **DONALD F. KEIR**
Mechanical Editor - **FREDERICK H. MOODY, B.A.Sc.**

Canadian Business Representative - **W. H. HEWITT**
70 Bond Street, Toronto

United States Business Representative, **A. FENTON WALKER**
143 Liberty Street, New York, N.Y.

European Business Representative - **J. MEREDITH McKIM**
16 Regent St., London, S.W., Eng.

Authorized by the Postmaster General for
Canada, for transmission as second class mat-
ter.

Entered as second class matter, July 25, 1913,
at the Postoffice at Buffalo, N.Y., under the
Act of Congress of March 3, 1879.

SUBSCRIPTION PRICE, including postage
anywhere, \$2 a year.

SINGLE COPIES, 20 cents each, including
postage.

The best and safest way to remit is by express
money order. Where one cannot be obtained, a
post office money order, or bank draft, payable
at par in Toronto, may be sent. Cheques or
drafts not payable at par in Toronto cannot be
accepted. Remittances should be made payable
to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on applica-
tion.

ADVERTISING COPY must reach the pub-
lishers by the 10th of the month preceding the
date of publication.

TORONTO, CANADA, FEBRUARY, 1916.

PRINCIPAL CONTENTS.

Appointments, Transportation	62
Birthdays of Transportation Men	50
Board of Railway Commissioners—	
Orders by, Summaries of	65
Traffic Orders	53
Canadian Northern Ry., Construction	54
Making a Fill on Rainy Lake	46
Steel Step Ladder for Sleeping Cars	43
Cars, Freight, Standard Lettering	41
Cartage Tolls, Collection by Railway Com- panies	43
Electric Railway Department	67 to
British Columbia Electric Ry. Report	69
Concrete Header Along Rails, Cost of	75
Concrete Poles for Electric Railways	70
Finance, Meetings, Etc.	74
Hydro Electric Commission of Ontario's To- ronto-London Railway	76
Lake Erie and Northern Ry., Electric Loco- motives	71
Passenger Cars	67
London and Port Stanley Ry., Earnings	72
Projects, Construction, Etc.	73
St. Clair Tunnel Operation	68
Toronto Civic Ry. Additional Cars	72
Express Companies, Among the	81
Freight and Passenger Traffic Notes	53
Grand Trunk Ry., Steel Suburban Cars	44
Mainly About Railway People	57
Marine Department	77 to
Dominion Wreck Commission and the Batiscan-Bengora Head Case	78
Grand Trunk Pacific Coast Steamship Co.'s Records	79
Imperial Oil Co.'s Steel Tank Vessels	79
Longshoremen's Dispute at St. John	77
New York State Barge Canal	78
Sault Ste. Marie Canal Traffic	77
Shipping Letter from Head of the Lakes	77
National Transcontinental Ry., Tank Car for Fire Fighting	42
New Year Honors for Transportation Men	55
Railway Development	49
Railway Earnings	52
Railway Finance, Meetings, Etc.	48
Railway Mechanical Methods and Devices	51
Railway Rolling Stock Notes	60
Railway Track Laid in 1915	66
Rate Meetings at Buffalo	81
Telegraph, Telephone and Cable Matters	

More Evidence of the Return of Canada's Business Prosperity.

Canadian railway earnings continue to show most gratifying results. The remarkable increase of \$6,447,813.21 in Canadian Pacific net earnings for the four months July 1 to Nov. 30, 1915, was referred to in our last issue. The net earnings for December are not available as this is written (Jan. 24) but the gross traffic earnings for December were very satisfactory, viz: \$12,580,000 for 1915, against \$7,321,000 in 1914, an increase for the month of \$5,259,000. Judging by the way the working expenses were decreased in Nov., 1915, a very satisfactory net was no doubt made in December. From Jan. 1 to 14, 1916, the gross traffic earnings were \$3,737,000 against \$2,637,000 for the same period of 1915, an increase of \$1,100,000. Of course the great increases made during the autumn movement of the grain crop could not be kept up, but the figures for the first half of January are very satisfactory and encouraging.

The Canadian Northern's full figures to Nov. 30 are available since our last issue. From Oct. 1, when it commenced to issue figures for the entire system, to Nov. 30, the gross earnings increased \$2,407,400, while the expenses only increased \$1,251,200, an increase in net earnings of \$1,156,200. The gross earnings for Dec. 1915, were \$3,435,600, against \$1,809,600 for Dec. 1914, an increase of \$1,626,000. For the first two weeks of Jan. 1916, the gross receipts were \$1,010,400, against \$665,000 for the same period in 1915, an increase of \$345,000, and from Oct. 1, 1915, to Jan. 14, 1916, the gross receipts were \$11,659,700, against \$7,259,400 in the same period of 1914-1915, an increase of \$4,400,300.

The Grand Trunk System traffic earnings for Dec. 1915 were \$4,819,124, against \$4,807,967 in Dec., 1914, an increase of \$731,157. For the first two weeks of Jan. 1916, the traffic earnings were \$1,847,003, against \$1,523,267 for the same period in 1915, an increase of \$323,736.

The Grand Trunk Pacific earnings, which are given out in sterling figures, increased from July 1, to Dec. 31, 1915, £229,903 over the corresponding period of 1914.

Canada's exports for 12 months ended Oct. 3, 1915, aggregated \$1,147,446,551, against \$1,086,568,316 for same period 1913-1914, \$1,127,282,699 for 1912-1913, and \$991,786,674 for 1911-1912.

Canada's revenues for the 9 months ended Dec. 31, 1915, were \$122,000,000, against \$99,600,000 for the corresponding period of 1914, an increase of \$22,400,000.

The building permits granted in 25 cities in the Provinces of Quebec, Ontario, Manitoba and British Columbia in Dec., 1915, were for \$3,388,714, against \$1,936,529 in Dec., 1914, an increase of 74.9%.

Toronto Telegram, Jan. 21:—Four hundred freight trains were handled on the G.T. R.'s Ontario Division in the past 24 hours, and the C.P.R. handled about 275. This is the largest movement of freight in 10 years.

At the Canadian Bank of Commerce annual meeting in Toronto recently, the President, Sir Edmund Walker, gave the following figures to show the astonishing change in Canada's international position in the last three years:—

	Imports.	Exports.
1913	\$86,515,536	\$377,068,355
1914	635,383,222	455,117,224
1915	497,376,961	461,442,509
6 months	228,335,678	273,377,082
	Excess	Excess
	Imports.	Exports.
1913	\$309,117,181	
1914	179,945,908	
1915	35,934,452	
6 months		\$45,941,404

Canada's production from the farms, forests and mines increased enormously in 1915 over 1914. The following figures were compiled by The Monetary Times:—

	1915.	1914.
Field crops	\$ 788,919,535	\$638,580,300
Forests	175,000,000	176,672,000
Mines	128,000,000	128,863,075
Fisheries	31,250,000	31,264,631
	\$1,123,169,535	\$975,380,006

Customs receipts throughout Canada for 1915 show in the aggregate a large increase over 1914. Following are the figures for the principal ports, also those for the whole country.

	1915.	1914.
Montreal	\$21,740,872	\$19,644,444
Toronto	18,630,695	16,508,763
Winnipeg	5,874,707	6,536,617
Vancouver	4,691,111	5,363,862
Hamilton	4,152,640	2,284,007
Windsor	3,843,810	2,094,535
St. John	2,542,059	1,547,318
Halifax	2,488,106	2,063,319
Quebec	2,076,146	1,854,847
Ottawa	1,587,556	1,532,759
Victoria	953,811	1,375,235
Calgary	873,224	1,346,281
Edmonton	718,096	1,159,915
Dominion of Canada total.	\$91,907,716	\$81,771,648

Canada's Remarkable Track Laying Record.

Though in view of the war conditions it could not be expected that the great activity which has been displayed in laying new steam railway track in Canada would be kept up during 1915, what was actually accomplished is a splendid showing, in view of the world wide conditions, no less than 714.26 miles of new first track having been laid.

Reports as to the amount of new first track laid in the United States during 1915 vary, the two leading authorities there giving considerably different figures. The Railway Review, Chicago, shows 1,157.79 miles, while the Railway Age Gazette, New York, shows only 933.24 miles. The significance of these figures will be realized when the respective populations of the two countries are considered. Canada's population by the last census taken in 1911 was 7,206,643, while that of the United States by the census of 1910 was 99,451,000.

The Transportation Interests Pre-eminent Position.

It is estimated that the January dividend and interest disbursements in Canada, exclusive of bonds and debentures, were approximately as follows:—

Transportation	\$6,538,656
Public utilities	2,628,317
Industrial	1,624,590
Mines	1,200,405
Banks	537,500
Mortgages and loans	548,606

The above figures show the immensity of transportation compared with other interests.

Progress of Rogers Pass Tunnel Construction, Canadian Pacific Railway.

The following table, for which we are indebted to J. G. Sullivan, M. Can. Soc. C.E., Chief Engineer, C.P.R., Winnipeg, shows the progress made from Dec. 2 to Dec. 30, also the total progress to Dec. 30, 1915:

	Progress.	Total.
EAST END.		
Main heading	1,174 ft.	1,174 ft.
Main tunnel	684 ft.	8,742 ft.
WEST END.		
Main heading	1,174 ft.	1,174 ft.
Main tunnel	742 ft.	7,692 ft.
Broke headings Dec. 19.		

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Alberta & Great Waterways Ry. See Edmonton, Dunvegan and British Columbia Ry.

Canadian Government Railways.—A. R. MACGOWAN, heretofore Division Engineer, Districts 3 and 4, Intercolonial Ry., and Prince Edward Island Ry., Moncton, N.B., has been appointed Principal Assistant Engineer, Canadian Government Railways. Office, Moncton, N.B.

C. B. TRITES, heretofore chief clerk, has been appointed Assistant Secretary, Canadian Government Railways Employees Relief and Insurance Association, W. C. PAVER, Secretary, having been granted leave of absence on account of ill health. Office, Moncton, N.B.

C. J. BOURGEOIS has been appointed acting chief clerk, Canadian Government Railways Employees Relief and Insurance Association, vice C. B. Trites, promoted. Office, Moncton, N.B.

See also Intercolonial Ry. and National Transcontinental Ry.

Canadian Northern Ry.—G. N. GOAD, heretofore chief clerk, General Manager's Office, Eastern Lines, has been appointed Inspector of Transportation, Eastern Lines, with such duties as are assigned to him from time to time. Office, Toronto.

F. E. McCORMICK, heretofore chief clerk, local freight department, Brandon, Man., has been appointed City Freight Agent, Winnipeg, vice R. M. Milliken, whose appointment as District Freight Agent, Brandon, was announced in our last issue.

W. WALKER has been appointed Shop Foreman, Winnipeg locomotive house, vice J. N. Duncanson, Assistant Locomotive Foreman, promoted.

W. SHEPHERD has been appointed Locomotive Foreman, Portage la Prairie, Man., vice S. Hicks, whose appointment as Locomotive Foreman, Boston Bar, B.C., was announced in our last issue.

J. N. DUNCANSON, heretofore Assistant Locomotive Foreman, Winnipeg, has been appointed Locomotive Foreman, Dauphin, Man., vice J. W. Skinner, who has been granted extended leave of absence while on active service.

E. BOWER, heretofore chief clerk to District Passenger Agent, Calgary, Alta., has been appointed Travelling Passenger Agent, Saskatoon, Sask.

W. EAGLESON has been appointed Roadmaster, Lucerne, B.C.

H. A. MacKENZIE has been appointed Roadmaster, Blue River, B.C.

C. F. O'CONNOR has been appointed Bridge and Building Master, Pacific Division. Office, Kamloops, B.C.

A. ANDERSON has been appointed Roadmaster, Kamloops, B.C.

T. WEBSTER has been appointed Roadmaster, Boston Bar, B.C.

B. T. CHAPPELL, Superintendent, Pacific Division, has had his office removed from Kamloops Jct., B.C., to Vancouver, B.C.

R. B. McINTOSH, heretofore District Freight Agent, Brandon, Man., has been appointed chief clerk in the district freight and passenger office at Vancouver, B.C.

Canadian Pacific Ocean Service, Ltd. The following general agents, Passenger Department, have been transferred from the C.P.R. Steamship Department to Canadian Pacific Ocean Services, Ltd.: W. WEBBER, Montreal; I. E. SUCKLING, Toronto; W. C. CASEY, Winnipeg; J. J. FORSTER, Van-

couver, B.C.; and H. M. MacCALLUM, Chicago, Ill.

G. M. JACKSON, heretofore General Agent, Passenger Department, C.P.R., San



P. 450
B. T. Chappell,
Superintendent, Pacific Division, Canadian Northern Railway.



P. 451
G. A. Walton,
General Passenger Agent, Western Lines, Canadian Pacific Railway.

Francisco, Cal., has been appointed General Agent, Passenger Department, C.P.O.S. Ltd., for Japan and Korea. Office, Yokohama, Japan.

C. E. TAYLOR, heretofore ticket agent, Southern Pacific Co., San Francisco, Cal., has been appointed Passenger Agent, C.P.O.S. Ltd., Yokohama, Japan.

A. J. BLAISDELL, heretofore General Agent, Passenger Department, C.P.R., St. Louis, Mo., has been appointed General Agent, Passenger Department, C.P.O.S. Ltd., for Northern China, including Tientsin and Peking. Office, Shanghai, China.

P. D. SUTHERLAND, heretofore Passenger Agent, C.P.R., Hong Kong, China, has been appointed General Agent, Passenger Department, C.P.O.S. Ltd., for Southern China, Philippines, Malay Federated States, Java, and India. Office, Hong Kong, China.

T. J. BURNS, heretofore Travelling Passenger Agent, Allan Line, Chicago, Ill., has been appointed Passenger Agent, C.P.O.S. Ltd., Hong Kong, China.

J. R. SHAW, heretofore Passenger Agent, C.P.R., Yokohama, Japan, has been appointed Passenger Agent, C.P.O.S. Ltd., Manila, Philippine Islands.

Canadian Pacific Ry.—E. W. BEATTY, K.C., Vice President and General Counsel, has been elected a director, succeeding D. McNicoll, resigned.

M. G. MURPHY, heretofore District Passenger Agent, Toronto, has been appointed District Passenger Agent, C.P.R., and Canadian Pacific Ocean Services, Ltd., St. John, N.B., vice W. B. Howard, transferred.

C. C. KIRBY has been appointed Division Engineer, Atlantic Division, vice J. E. Beatty transferred. Office, St. John, N.B.

R. McKILLOP has been appointed Superintendent, District 2, Atlantic Division, vice A. Williams, transferred. Office, Woodstock, N.B.

A. WILLIAMS, heretofore Superintendent, District 2, Atlantic Division, Woodstock, N.B., has been appointed Superintendent, District 1, Atlantic Division, vice V. A. Harshaw, transferred. Office, Brownville Jct., Me.

V. A. HARSHAW, heretofore Superintendent, District 1, Atlantic Division, Brownville Jct., Me., has been appointed Assistant Superintendent, District 3, Eastern Division, vice E. J. Melrose, transferred. Office, Montreal.

A. R. KETTERSON, heretofore in Engineering Department, Western Lines, Winnipeg, has been appointed Assistant Engineer to Assistant Chief Engineer, Eastern Lines, Montreal.

J. W. WANSBROUGH, heretofore chief dispatcher, Toronto, has been appointed Inspector of Transportation, Montreal, vice G. T. Rooke, transferred.

J. BARCLAY is acting Assistant General Storekeeper, Eastern Lines, during the absence of G. E. Hall, on active service in Europe. Office, Montreal.

E. J. MELROSE has been appointed acting Assistant Superintendent, District 1, Eastern Division, vice W. H. Stewart, Assistant Superintendent, loaned to the Imperial Munitions Board, Ottawa.

W. B. HOWARD, heretofore District Passenger Agent, St. John, N.B., has been appointed District Passenger Agent, Toronto, vice M. G. Murphy, transferred.

G. T. COLEMAN, heretofore Car Service and Fuel Agent, Moose Jaw, Sask., has been appointed Car Service Agent, Ontario Division, vice G. T. Rooke, transferred. Office, Toronto.

F. W. COOPER, A.M. Can. Soc. C.E., heretofore Superintendent, District 1, Eastern Division, Farnham, Que., has been appointed Superintendent, District 3, Lake Superior

February, 1916.]

Division, vice J. H. Boyle, transferred. Office, Schreiber, Ont.

G. A. WALTON, heretofore General Agent, Passenger Department, Chicago, Ill., has been appointed General Passenger Agent, Western Lines, with territory, Field, Kootenay Landing and easterly, vice A. C. Shaw, transferred to other duties at Montreal. Office, Winnipeg.

G. H. SMITH, heretofore Division Freight Agent, Manitoba Division, Winnipeg, has been appointed Assistant General Freight Agent, Western Lines. Office, Winnipeg.

H. H. TRIPP, formerly of Edmonton, Alta., has been appointed Resident Engineer, Winnipeg Terminals, vice S. C. Wilcox, who has been appointed a Lieutenant in the 100th Battalion, Winnipeg Grenadiers, for active service.

A. BROWN, heretofore Locomotive Foreman, Fort William, Ont., has been appointed District Master Mechanic, Winnipeg Terminals, vice A. Peers, transferred.

A. T. McKEAN, heretofore City Freight Agent, Winnipeg, has been appointed Division Freight Agent, Manitoba Division, vice J. H. Smith, promoted. Office, Winnipeg.

A. LEDINGHAM, heretofore Soliciting Freight Agent, Winnipeg, has been appointed City Freight Agent there, vice A. T. McKean, promoted.

W. J. RENNIE, heretofore chief clerk to Assistant Freight Traffic Manager, Western Lines, Winnipeg, has been appointed Soliciting Freight Agent there, vice A. Ledingham, promoted.

A. WALKER has been appointed chief clerk to Assistant Freight Traffic Manager, Western Lines, Winnipeg, vice W. J. Rennie, promoted.

T. FAWCETT, heretofore General Fuel Agent, Western Lines, Winnipeg, has been appointed Assistant General Storekeeper, Western Lines, Winnipeg.

J. M. FRYERS, heretofore Trainmaster, District 3, Saskatchewan Division, Saskatoon, has been appointed Trainmaster, District 3, Manitoba Division, vice J. A. Audrain, transferred. Office, Minnedosa.

J. A. AUDRAIN, heretofore Trainmaster, District 3, Manitoba Division, Minnedosa, has been appointed Trainmaster, District 3, Saskatchewan Division, vice J. M. Fryers, transferred. Office, Saskatoon, Sask.

A. PIERS has been appointed District Master Mechanic, District 2, Saskatchewan Division, vice J. Neill. Office, Moose Jaw.

J. M. MacARTHUR, heretofore Terminal Trainmaster, Calgary, Alta., has been appointed acting Superintendent, District 2, Alberta Division, vice F. Walker, who has been granted indefinite leave of absence owing to illness. Office, Calgary.

J. A. PANTER has been appointed acting Terminal Trainmaster, Calgary, Alta., vice J. M. MacArthur, promoted.

W. J. RENIX, heretofore District Master Mechanic, Calgary, Alta., has been appointed District Master Mechanic, District 1, British Columbia Division, vice L. Fisher, assigned to other duties. Office, Revelstoke.

M. K. WHYTE has been appointed Yardmaster, Revelstoke, B.C., vice T. Hope, enlisted for active service.

The position of Superintending Engineer, British Columbia Lake and River Service, Nelson, B.C., heretofore occupied by D. STEPHENS, has been abolished temporarily. He has been granted leave of absence for a short time, and will probably resume his former position as chief engineer (marine), Okanagan Lake service.

H. A. SPIERS, heretofore Fuel Agent, Vancouver, B.C., has been appointed Assistant Storekeeper there.

T. M. McKEOWN, heretofore Commissary Agent, Winnipeg, has been appointed Com-

missary Agent, Victoria, B.C., vice W. Bell, enlisted for overseas service.

L. R. HART, heretofore chief clerk, Passenger Department, New York, N.Y., has been appointed General Agent, Passenger Department, Buffalo, N.Y., covering New York State west of and including the Dela-



P. 452. G. W. Caye, General Purchasing Agent, Grand Trunk Railway.



P. 433. A. A. Tisdale, Assistant to Vice President and General Manager, Grand Trunk Pacific Railway.

ware, Lackawanna and Western Ry. line from Binghamton to Oswego.

T. J. WALL, heretofore General Agent, Passenger Department, Minneapolis, Minn., has been appointed General Agent, Passen-

ger Department, Chicago, Ill., vice G. A. Walton, promoted.

R. S. ELWORTHY has been appointed General Agent, Passenger Department, Minneapolis, Minn., vice T. J. Wall, whose appointment as General Agent, Passenger Department, Chicago, Ill., was announced in our last issue.

F. L. NASON, heretofore City Ticket Agent, San Francisco, Cal., has been appointed General Agent, Passenger Department, there, vice G. M. Jackson, transferred to service of Canadian Pacific Ocean Services, Ltd.

A. G. ALBERTSEN, heretofore Travelling Passenger, San Francisco, Cal., has been appointed City Ticket Agent there, vice F. L. Nason, promoted.

F. J. VILLAIN has been appointed Travelling Passenger Agent, San Francisco, Cal., vice A. G. Albertsen, promoted.

Central Canada Ry. See Edmonton, Dunvegan & British Columbia Ry.

Duluth, South Shore and Atlantic Ry., Mineral Range Rd.—E. R. LEWIS, M.Am. Soc. C.E., Assistant to the General Manager, Duluth, Minn., has been given charge of all matters pertaining to engineering, maintenance of way and structures and federal valuation of these companies.

Eastern British Columbia Ry.—J. M. BOYES, heretofore Locomotive Foreman, C.P.R., Cranbrook, B.C., has been appointed Locomotive Foreman, E.B.C.R., Corbin, B.C., as reported in our last issue.

Edmonton, Dunvegan & British Columbia Ry.—N. F. JUDAH, heretofore in Comptroller's office, C.P.R., Montreal, has been appointed Auditor, E.D. & B.C.R., Alberta & Great Waterways Ry. and Central Canada Ry.

Grand Trunk Ry.—J. B. McLAREN, heretofore Auditor of Freight Accounts, has been appointed Auditor of Revenues in charge of Freight and Passenger Accounts, and his former position, together with that of Auditor of Passenger Accounts, hitherto held by G. B. Filgiano, have been abolished. Office, Montreal.

The position of Superintendent of Time Service, heretofore held by Professor C. H. McLeod, M.Can.Soc.C.E., has been abolished, and all matters pertaining to the time service are now under the jurisdiction of the Manager of Telegraphs, H. HULATT, Montreal, to whom all correspondence, reports, etc., are addressed.

W. McNAB, heretofore Principal Assistant Engineer, has been appointed Valuation Engineer. Office, Montreal.

A. CRUMPTON, heretofore Assistant Engineer, Montreal, has been appointed Assistant Valuation Engineer. Office, Montreal.

BARTON WHEELWRIGHT has been appointed acting Signal Engineer, vice R. F. Morkill, Signal Engineer, on active military service. Office, Montreal.

Grand Trunk Pacific Ry.—A. A. TISDALE, heretofore Superintendent, Regina Division, Regina, Sask., has been appointed Assistant to Vice President and General Manager, vice G. W. Caye, resigned to enter G.T.R. service. Office, Winnipeg.

E. McDONALD, heretofore District Baggage Agent, G.T.P.R. and Grand Trunk Pacific Coast Steamship Co., Winnipeg, has been appointed General Baggage Agent, vice J. E. Quick, who retains the position of General Baggage Agent, G.T.R., Toronto. The position of District Baggage Agent has been abolished. Office, Union Station, Winnipeg.

H. McCALL, Superintendent, Winnipeg, Man., to Watrous, Sask., and the Melville-Canora Branch, has had his jurisdiction extended to cover the Regina Division, hitherto

under the jurisdiction of A. A. Tisdale, promoted. Office, Melville, Sask.

J. BREWER, heretofore Chief Dispatcher, Regina, Sask., has been appointed Assistant Superintendent, there.

Intercolonial & Prince Edward Island Rys. F. O. CONDON, heretofore Resident Engineer, Intercolonial Ry., Campbellton, N.B., has been appointed Division Engineer, Districts 3 and 4, Intercolonial Ry., and Prince Edward Island Ry., vice A. R. Macgowan, promoted. Office, Moncton, N.B.

The jurisdiction of J. T. HALLISEY, Superintendent, Truro, N.S., has been extended over the Dartmouth-Deans Branch, which has been incorporated with District 3, as the Dartmouth Subdivision.

W. R. CONWAY has been appointed acting wharfinger at St. John, N.B., vice J. McMulklin, resigned.

R. A. BLACK, heretofore Resident Engineer, District 5, National Transcontinental Ry., Edmundston, N.B., has been appointed Resident Engineer, District 2, I.R.C., vice F. O. Condon. Office, Campbellton, N.B.

W. F. SMALLWOOD, heretofore locomotive driver, has been appointed Locomotive Foreman, temporarily, at Newcastle, N.B., a new position.

A. ASTLE, heretofore Roadmaster, Fredericton Subdivision, Fredericton, N.B., has been appointed Roadmaster, Newcastle, N.B. vice A. P. Giles, retired.

S. ALLANACH has been appointed acting Roadmaster, Fredericton Subdivision, Fredericton, N.B., vice A. Astle, transferred.

National Transcontinental Ry.—J. F. FLYNN has been appointed Roadmaster from mileage 63.4, Grant Subdivision, to mileage 132.4, Armstrong Subdivision, vice J. R. Logan. Office, Armstrong, Ont.

H. S. CLARKE has been appointed Resident Engineer, District 5, vice R. A. Black, transferred to I.R.C. service. Office, Edmundston, N.B.

J. REEVES has been transferred from the Transcona repair yard to Redditt, Ont., vice W. Jones.

W. MILLS has been appointed Car Foreman in charge of all work at Transcona yards, Transcona, Man.

W. JONES, heretofore at Redditt, Ont., has been appointed Assistant Foreman in charge of freight car repair yard, Transcona, Man.

New York Central Rd., West Shore Rd.—

W. R. B. BARNET, Assistant General Passenger Agent, lines east of Buffalo, N.Y., having resigned to engage in other business, the following have been appointed:—C. C. HOWARD, Assistant General Passenger Agent, Grand Central Terminal, New York; W. V. LIFSEY, Assistant General Passenger Agent, 1216 Broadway, New York; H. PARRY, Assistant General Passenger Agent, Buffalo, N.Y.

Pere Marquette Rd.—R. C. VANDERCOOK has been appointed Manager of Public Relations Department, Detroit, Mich.

JOHN DUNPHY has been appointed Assistant General Passenger Agent, Detroit, Mich.

Prince Edward Island Ry.—See Intercolonial Ry.

St. John and Quebec Ry.—F. W. SUMNER, Moncton, N.B., is reported to have been elected President, vice I. R. Todd, resigned.

Toronto, Hamilton & Buffalo Ry.—A. E. LOCK, heretofore Car Accountant, has been appointed Superintendent of Car Service. Office, Hamilton, Ont.

Wabash Ry.—J. D. McNAMARA, heretofore General Passenger Agent, has been appointed Passenger Traffic Manager. Office, Railway Exchange Bldg., St. Louis, Mo.

British Columbia Freight Rates and Interswitching Charges.

With the advent of the Canadian Northern Ry. as a transcontinental line, through the recent opening of the Canadian Northern Pacific Ry., a new freight traffic situation has been created in Vancouver. As the new line reaches the Pacific Coast via Edmonton, a considerable stretch of territory is brought much nearer Vancouver by the C.N.R. lines, than it is by the Canadian Pacific, and some portions of the territory in Alberta and Saskatchewan, which heretofore have been regarded as being within the area of trade for eastern wholesalers, are brought within that of the Pacific Coast. The freight rates on the Canadian Northern Pacific, are under the control of the British Columbia Government, that being part of the contract under which that Government guaranteed the bonds for the construction of the line. Part of the area covered by the Canadian Northern lines, in Alberta and Saskatchewan, affected by the present so called "rate war," is served by

while the C.P.R. states that it is not called upon to do any of these services for the Canadian Northern, that it can fix its own charges as against a railway whose rates are fixed by the Provincial Government, and that the Provincial Government cannot exercise any control over its rates. When the Canadian Northern appealed to the Dominion Government in 1914 for aid, the question of the Dominion control of freight rates was raised, but owing to protests made by the three Provinces interested a section of the act provides that the Canadian Northern Pacific Ry., the Canadian Northern Western Ry., and the Canadian Northern Saskatchewan Ry., may be brought under the control of the Board of Railway Commissioners, so far as freight rates are concerned, by proclamation of the Governor General, after the completion of the lines. It is said in Vancouver trade circles that steps are being taken to have the Dominion control extended over the lines in question.

Canadian Northern officers in Winnipeg are reported to have stated, on Jan. 5, that most of the freight shipped in and out of Vancouver over their line is not competitive, and the extra charges for interswitching charged by the C.P.R. really hit the manufacturer and the wholesaler. On competitive traffic the Canadian Northern has absorbed the cost of teaming freight between warehouses of shippers and consignees and its freight terminals for its own protection.

White Pass and Yukon Railway Company's Annual Meeting.

At the annual meeting in London, Eng., Dec. 6. C. C. Macrae, Chairman of the company, in moving the adoption of the report for the year, stated that all their anticipations as to the beneficial results which they were led to believe would follow the purchase of the Northern Navigation and Northern Commercial companies were entirely upset by the war, with the result that they had to go to the debenture holders and ask their forbearance and their consent to the funding of their coupons for the past year. He pointed out that there was an item on the credit side of the profit and loss account, for interest on securities of local companies, mentioned as paid and accrued, but they had recently become acquainted with the fact that none of this amount had been paid, and this had brought about a situation of the utmost possible difficulty, and they were compelled to go to the debenture holders again, but up to the time of his speaking they had not been able to arrive at what might be called a formulated proposal to submit. He disclaimed responsibility for the state of things as shown by the statement, and offered to resign from the chairmanship if thought desirable. The report was adopted without discussion.

Canadian Wheat at Duluth.—A Duluth, Minn., press dispatch, Jan. 13.—"Canadian wheat is arriving in Duluth at the rate of about 50 cars daily. With the elevators at the Canadian head of the lakes congested, Duluth is the only outlet. The elevators here were completely emptied at the close of navigation and are in good shape to care for the Canadian wheat, despite heavy United States receipts. Some all rail shipments from Duluth to the east are being made, but the influx of Canadian wheat has had the effect of making vessel rates for spring very firm. Offers of 4¼c from Duluth to Buffalo for spring tonnage have been refused here. There is said to be some tonnage on the market here at 5c."



453
C. H. Towle,
Assistant Superintendent, District 1, Atlantic
Division, Canadian Pacific Railway.

the Canadian Northern Western Ry., and the Canadian Northern Saskatchewan Ry., the freight rates on which lines are under the control of the Alberta and Saskatchewan Governments respectively, under the terms of the bond guarantee agreements. The freight rates from the territory served by these lines, owing to the shorter mileage to Vancouver, are lower than those of the C.P.R., but inasmuch as the Canadian Northern is at present without terminal facilities, industrial spurs, etc., in Vancouver, it is dependent upon the C.P.R. for the distribution of its freight there, and the switching of cars from factories, etc., for which services the C.P.R. makes its charge. The C.P.R. routes for freight, interswitching, etc., are subject to the control of the Board of Railway Commissioners, and the tariffs at present in effect have been so approved. The Canadian Northern alleges that the C.P.R. is charging it much higher rates for switching than the tariff calls for.

Orders by the Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed the paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which they were drawn.

24552. Dec. 9.—Approving agreement between Bell Telephone Co. and La Cie. de Telephone de Contrecoeur, Nov. 30.

24553. Dec. 9.—Amending order 24455, Nov. 18, re street extension across C.P.R. at Keddlestone, Sask.

24554. Dec. 11.—Authorizing Montreal & Southern Counties Ry. to open for traffic between St. Cesaire and Abbotsford, Que., 6.83 miles.

24555. Dec. 15.—Amending order 24511, Dec. 1, re Canadian Northern Ry. highway crossing at St. Joseph Street, La Tuque, Que.

24556. Dec. 16.—Authorizing London Railway Commission to build one track of London & Port Stanley Ry. across Nelson St., and five tracks across Phillip St., London, Ont.

24557. Dec. 16.—Rescinding order 3506, July 19, 1907, re C.P.R. branch from Southwestern and Pembina Mountain Branch, Winnipeg.

24558. Dec. 16.—Authorizing Canadian Northern Ry. to build highway crossing over its track between Secs. 22 and 27-46-22, w.2.m., Sask.

24559. Dec. 17.—Authorizing G.T.R. to build two spurs in Berlin, Ont.

24560. Dec. 17.—Approving location and details of Algoma Eastern Ry. station building at Creighton, Ont.

24561. Dec. 11.—Authorizing C.P.R. to build siding for City of Outremont, Que.

24562. Dec. 15.—Authorizing Saskatchewan Highway Commission to build highway over Canadian Northern Ry. at Main St., Buchanan.

24563. Dec. 14.—Extending for 30 days from date time within which C.P.R. shall install gates at Talbot Ave., Winnipeg.

24564. Dec. 13.—Authorizing C.P.R. to build siding for Corrugated Paper Co., North Toronto, and rescinding order 24308, Oct. 9.

24565. Dec. 13.—Authorizing Canadian Northern Ontario Ry. to build spur for Godson Contracting Co., Pickering Tp., Ont.

24566. Dec. 13.—Ordering G.T.R. to install gates at highway immediately west of Lorne Park station, Ont., by June 1, 1916.

24567. Dec. 14.—Ordering that the speed of Elgin & Havelock Ry. trains operated over three bridges north of Petitcodiac, N.B., be limited to 8 miles an hour, pending laying of 8 x 8 ins. x 12 ft. ties, when guard rails shall be installed; ties and guard rails to be laid by May 1, 1916; crossing signs to be erected at all highways on line by Dec. 31.

24568. Dec. 11.—Authorizing Montreal & Southern Counties Ry. and C.P.R. to operate over crossings on Lot 34, St. Hyacinthe to Farnham, Que., without first stopping.

24569. Dec. 18.—Dismissing complaint of City Transfer Co., Edmonton, Alta., re breaches of contract with Canadian Northern Ry., Feb. 1, 1911.

24570. Dec. 14.—Approving revised location of Grand Trunk Pacific Branch Lines Co.'s Battleford Branch in Secs. 10, 15, and 22-38-16, w.3.m., Sask.

24571. Dec. 11.—Authorizing Montreal & Southern Counties Ry. to use certain bridges.

24572. Dec. 15.—Authorizing C.P.R. to build siding for Fraser, Ltd., Victoria, N.B.

24573, 24574. Dec. 10.—Approving Bell Telephone Co.'s agreement with Camden Independent Telephone Co., Nov. 30, and Urban & Rural Telephone Co., Dec. 1.

24575. Dec. 20.—Extending to June 30, 1916, time within which Canadian Northern Ry. shall equip its cabooses with air brakes, subject to condition that cabooses already so equipped be kept in service as much as possible.

24576. Dec. 20.—Authorizing C.P.R. to build extension to siding for Pembroke Shook Mills Ltd., at mileage 106.5, Chalk River Subdivision.

24577. Dec. 18.—Authorizing Niagara, St. Catharines & Toronto Ry. to operate spur 1,062 ft., from its Queenston St. line down Phelps St., St. Catharines.

24578. Dec. 20.—Authorizing Canadian Northern Ry. to cross road between Secs. 9 and 8-18-22, w.1.m., Man.

24579. Dec. 20.—Authorizing St. Lawrence & Adirondack Ry. to build spur for Castings Co. of Canada, Ltd., Valleyfield, Que.

24580. Dec. 18.—Ordering C.P.R. to fence right of way on its Sirdar Subdivision, B.C., from mileage 75.45 to 77, to be completed by May 15, 1916.

24581. Dec. 17.—Authorizing C.P.R. to divert road across its Outlook Subdivision, mileage 48.4, Sask.

24582. Dec. 18.—Extending to May 15, 1916, time within which Grand Trunk Pacific Ry. shall fence its ballast pit, on its Regina-Boundary Branch.

24583. Dec. 21.—Authorizing Canadian Northern Ontario Ry. to build bridge in E. ½ Lot 11, Con. 14, Orillia Tp., to carry Trent Canal across its track.

24584. Dec. 20.—Authorizing Canadian Northern Ry. to build spur for Winnipeg Supply & Fuel Co., Ltd., Winnipeg.

24585. Dec. 22.—Authorizing Dominion Atlantic Ry. to open for traffic its revised location from east side of Sissiboo River, near Weymouth, N.S., to west side of river, 2,241 ft.

24586. Dec. 18.—Authorizing Canadian Northern Alberta Ry. to build Brule Lake spur through Secs. 3, 10, 14 and 15-50-27, w.5.m., Alta., crossing two unopened road allowances.

24587. Dec. 22.—Authorizing G.T.R. to build siding for Cleveland Sarnia Saw Mills Co., Sarnia, Ont.

24588. Dec. 22.—Disallowing certain notices of revocation of general notices of concurrence in joint freight rates, and certain schedules purporting to withdraw and cancel the joint rates to which they refer. This order is given fully on another page.

24589. Dec. 22.—Authorizing Dominion Atlantic Ry. to open for traffic portion of revised location from near Chestnut St., Avon, N.S., to the Avon River, 3,250 ft.

24590. Dec. 22.—Authorizing Canadian Bank of Commerce, Red Deer Branch, to pay to Calgary & Edmonton Ry., \$1,277 of the \$1,400 deposited to Board's credit, and pay the remainder, with accrued interest, if any, to Saskatchewan Land & Homestead Co.

24591. Dec. 22.—Authorizing G.T.R. to rebuild bridge carrying Main St., Watford, Ont. across its tracks.

24592. Dec. 20.—Ordering Canadian Northern Ry. to do certain work at highway between Secs. 28 and 29-30-18, w. 4 m., Mecheche, Alta.

24593. Dec. 23.—Approving details of Vancouver, Victoria & Eastern Ry. and Navigation Co.'s station and facilities in Vancouver, B.C.

24594. Dec. 22.—Approving agreement between Bell Telephone Co. and Consolidated Telephone Co., Dec. 10.

24595. Dec. 22.—Recommending to Governor in Council for sanction, traffic agreement between the Essex Terminal Ry. and C.P.R.

24596. Dec. 23.—Approving Lake Erie & Northern Ry. bylaw authorizing Martin N. Todd, General Manager, and C. J. Whitney, Freight and Passenger Agent, to prepare and issue tariffs of tolls.

24597. Dec. 23.—Ordering G.T.R. by June 1, 1916, to install improved type of automatic bell at crossing of Chatham Road, Thamesville, Ont.

24598. Dec. 22.—Authorizing St. Joseph de Deschambault Parish, Que., to build highway crossing over C.P.R. near mileage 119.1, Quebec Subdivision, and to close existing crossing.

24599. Dec. 23.—Authorizing Canadian Northern Ry., C.P.R., and Great Northern Ry., to operate over C.N.R. and C.P.R. near Emerson Station, Man., at speed not exceeding 15 miles an hour.

24600, 24601. Dec. 28, 27.—Approving Lake Erie & Northern Ry. Standard Freight Tariff C.R.C. 1; and Standard Passenger Tariff, C.R.C. 1, the latter applying rate of 2½¢ a mile.

24602. Dec. 27.—Ordering Canadian Northern Ontario Ry. and C.P.R. to arrange operation of switches and signals at Belleville, Ont.

24603. Dec. 24.—Approving clearances between C.P.R. siding and buildings of Salmon Arm Farmers' Exchange at Salmon Arm, B.C.

24604. Dec. 24.—Authorizing G.T.R. to connect two siding tracks with spur owned by St. Davids Sand Co., near St. Davids, Ont.; and approving layout of automatic signals there.

24605. Dec. 27.—Amending order 23857, June 14, re crossing of Canadian Northern Quebec Ry., St. Joseph de Deschambault Parish.

24606. Dec. 28.—Authorizing Canadian Northern Ry. to build spur on W. ½ Sec. 12-30-15, Rosetown, Sask.

24607. Dec. 27.—Ordering C.P.R. to build siding for J. H. Theoret, St. Eustache Parish, Que.

24608. Dec. 27.—Relieving G.T.R. from providing further protection at first crossing south of St. Isidore Jct., Que.

24609. Dec. 28.—Authorizing Essex Terminal Ry. to build second main track across Dougall Road, Sandwich West Tp., Ont.

24610. Dec. 27.—Ordering Grand Trunk Pacific Branch Lines Co. to appoint station agent at Coleville, Sask.

24611. Dec. 28.—Authorizing C.P.R. to build spur at mileage 4.34, Quebec Subdivision, connecting with Laurin & Leich's siding.

24612. Dec. 28.—Extending for 3 months from Dec. 31, time within which C.P.R. may carry traffic over its Stirling East Branch, mileage 49.2 to 74.5, Alta.

24613. Dec. 29.—Authorizing St. Placide, and St. Benoit parishes, Que., to build shelter and platform on Canadian Northern Ry. at Coutte Double, Que., according to C.N.R. standard station plan 3.

24614. Dec. 28.—Ordering Toronto, Hamilton & Buffalo Ry. to build new bridge carrying King St., Hamilton, over its tracks; bridge to be same width as McKettrick Bridge, and designed to accommodate double line of street cars, and loads of same capacity as McKettrick Bridge; 30% of cost to be paid by City, and balance by T.H. & B.R.

24615. Dec. 29.—Ordering C.P.R., pending further order, to maintain present train service between Kingston and Renfrew, Ont.

24616. Dec. 31.—Approving location and detail plans, Oct. 1, and station building sheets 1 and 2, of 7, showing Canadian Northern Ontario Ry. station building at Napanee.

24617. Dec. 30.—Ordering G.T.R. to build highway between Cons. 8 and 9, Cumberland Tp., Ont., and remove bushes to give view of approaching trains 100 ft. from crossing, and half mile along railway on both sides of crossing; work to be completed by May 31, 1916.

24618. Dec. 28.—Authorizing G.T.R. to build spur for Canadian Fairbanks Morse Co., Toronto.

24619. Jan. 3, 1916.—Amending orders 18946 and 24590, Mar. 20, 1913, and Dec. 22, 1915, re Calgary & Edmonton Ry. spurs for Saskatchewan Land and Homestead Co.

24620. Jan. 3.—Authorizing C.P.R. to build siding and grain loading platform on S.W. ¼ Sec. 22, at Navarre, Alta.

24621. Jan. 3.—Authorizing Edmonton, Dunvegan & British Columbia Ry. to build across 9 highways.

24622 to 24625. Jan. 3, 4.—Approving Bell Telephone Co. agreement with four telephone companies in Ontario.

24626. Jan. 5.—Approving Montreal & Southern Counties Ry. standard freight mileage tariff, C.R.C. 5, cancelling C.R.C. 1, effective Jan. 15, and rescinding order 21566, Apr. 1, 1914.

24627. Jan. 7.—Authorizing City of Winnipeg to complete work at Bell Ave., according to plans approved by Board in connection with grade separation at north approach to Norwood Bridge, and place in good condition for traffic outlet from Bell Ave. north of Main St., as well as south to bridge; cost of additional work apportioned as follows: 20% out of railway grade crossing fund; 30% of remainder each by Canadian Northern Ry., City of Winnipeg and City of St. Boniface, and 100% by Winnipeg Electric Ry.

24628. Jan. 10.—Suspending, pending hearing by Board, Dominion Ex. Co. Supplement 11 to C.R.C. 4418, and Supplement 8 to C.R.C. 4437; Canadian Ex. Co. tariffs C.R.C. 1683, 1684, 1685 and 1686, and Supplement 2 to C.R.C. 1622; and Canadian Northern Ex. Co. Supplement 1 to C.R.C. 835 and Supplement 1 to C.R.C. 1527, effective Jan. 15.

24629. Jan. 7.—Authorizing London Railway Commission to cross at grade London St. Ry. with London & Port Stanley Ry. at corner of Richmond and Bathurst Sts., London, Ont.

24630. Jan. 7.—Approving plans dated Aug. 24, 1915, showing revised location of Lake Erie and Northern Ry. yards and station, mileage 36.75, at Watford, Ont., and rescinding order 24024, July 23, 1915.

24631. Jan. 10.—Extending for 1 year from Dec. 31, 1915, order 12723, Dec. 6, 1910, re Canadian Northern Ontario Ry. crossing of Hurdman's Road, Nepean Tp.

24632. Jan. 10.—Extending to Apr. 1st, time within which C.P.R. shall install gates at Symington Ave., Toronto, crossing to be protected by day and night watchmen, wages paid half each by C.P.R. and the City, and reserving question of C.P.R. indemnifying city against damages during extension.

24633. Jan. 10.—Ordering G.T.R. within 90 days to install automatic bell at second crossing east of Baden station, Ont., 20% of cost of installing to be paid out of railway grade crossing fund.

24634. Jan. 10.—Authorizing G.T.R. to build extensions to two spurs for H. Corby Distillery Co., Corbyville, Ont.

24635. Jan. 10.—Authorizing C.P.R. to build spur for Nicholson & Bain, Calgary, Alta.

The Interstate Commerce Commission, in its annual report issued recently, says that the variety and volume of the work already laid upon it make necessary an early enlargement of its membership and legal authority to take final action through subdivisions of its membership, of course under the general authority of the commission as a whole. Bills to effect this have already been introduced in Congress.

Passenger Rate Meetings at Buffalo.

The Niagara Frontier Summer Rate Committee and the Great Lakes & St. Lawrence River Rate Committee met at Buffalo in January. The rate representatives met on Jan. 4 and 5 for compilation of fares, etc., and the annual meetings of the two committees were held on Jan. 6, the proceedings consisting of the usual routine. C. C. Howard, A.G.A., New York Central Rd., New York, was elected Chairman of the Niagara Frontier Summer Rate Committee for this year, and L. G. Lewis, G.P. & T.A., Detroit & Cleveland Navigation Co., Detroit, Mich., was elected Chairman of the Great Lakes & St. Lawrence River Rate Committee. Jas. Morrison, A.G.P.A., Eastern Lines, Canadian Northern Ry., Montreal, is permanent Secretary of both committees.

R. L. Fairbairn, G.P.A., Eastern Lines, Canadian Northern Ry., Toronto, retiring Chairman of the Niagara Frontier Summer Rate Committee, was presented with a gavel, the head of which is a piece of one of the break-up timbers used in constructing the Mount Royal tunnel, Montreal. Embedded in the head of the gavel at both ends are pieces of the drill which first punched a hole through the tunnel, connecting the two sections which had been worked from opposite sides of the mountain. The handle is a piece of mahogany from the C.N.R.'s sleeping car Brockville, which made its first trip on the train inaugurating the C.N.R.'s through Toronto-Winnipeg service on Nov. 1 and on which car Mr. Fairbairn travelled.

The International Water Lines Passenger Association held its meeting Jan. 5, the chair being taken by the Vice President, F. B. Hibbard, G.P.A., Hudson River Day Line, New York, in the absence of the President, W. P. Hinton, T.M., Grand Trunk Pacific Ry. A gavel for the retiring President was presented, made from cabin fittings of the C.P.R. steamship Princess Margaret, which was built in Scotland in 1914 for service on the British Columbia coast and Puget Sound but was taken over by the British Government on completion.

The question of the redemption of passage tickets, or unused portions of them, on which berth reservations were made, was discussed and it was decided that it was largely a matter for the interested lines to agree upon among themselves. After the meeting a number of interested lines agreed that the following rule be placed in effect and tried during this year, viz.:—"That a charge (amount left to each line) be made on all reservations not released at least 48 hours in advance of sailing and which were not resold."

The question of a terminal charge of 10c. to be made in checking baggage, to be in no way connected with the charge for transportation, the additional expense incurred by the passenger to be covered by the acceptance of unlimited liability by the carrier, and also the proposal that the practice

of placing prepaid orders by telegram or telephone be discontinued, were removed from the docket, as it appeared that they had not been placed in effect by other territorial associations or individual railway lines.

It was decided to prohibit the use of imitation passage tickets, or the use of anything having semblance thereto, for advertising, theatrical, school or similar purposes foreign to legitimate use of regular tickets.

It was reported that advice had been received from the Commissioner of Internal Revenue, Washington, D.C., that the War Revenue Tax Law enacted Dec. 17, 1915, is continued in full force and effect up to Dec. 31, 1916.

It was decided that reservations for out of town people, not ticket agents, should be accompanied by deposit.

The following officers were elected for this year:—President, F. B. Hibbard, G.P.A., Hudson River Day Line, New York; Vice President, E. W. Holton, G.P.A., Northern Navigation Co., Sarnia, Ont.; Executive Committee, W. F. Wasley, Muskoka Lakes Navigation and Hotel Co., Gravenhurst, Ont.; J. Berolzheimer, Chicago, Duluth and Georgian Bay Transit Co., Chicago, Ill.; P. Robbins, Goodrich Transit Co., Chicago, Ill. The permanent Secretary is M. R. Nelson, Northern Steamship Co., New York, who was elected in 1910.

It was decided to hold the next meetings of the three associations at Quebec, Que., in Jan., 1917.

Official Freight Classification Ratings in United States.

The Interstate Commerce Commission gave a decision at Washington, D.C., Dec. 14, 1915, which is summarized as follows:

Upon consideration of objections to proposed changes in classification ratings on certain commodities named in supplement 9 to official classification 42, and certain other tariffs, and of the facts, circumstances, and conditions shown of record in relation thereto; held:

Proposed higher ratings on beer, beer tonic, ale, and porter in carloads and less than carloads; on nonalcoholic beverages in carloads and less than carloads; on tobacco cuttings or scraps and tobacco siftings or sweepings in less than carloads; on plug or twist tobacco in carloads and less than carloads; on grain and grain products in less than carloads; on animal, poultry, and pigeon feed, not medicated, in less than carloads; and on rags, waste paper, and other paper makers' fibres in less than carloads, not justified.

Proposed higher ratings on beer barrels and certain other cooperage, both new and old, in carloads and less than carloads; and on old bottles in carloads and less than carloads, and old bottle carriers in carloads, justified.

Proposed establishment of carload and less-than-carload ratings on leaf tobacco in

lieu of any-quantity rating not justified.

Proposed increased estimated weights of flour in barrels and half barrels justified.

Michigan Central Railroad and London and Port Stanley Railway Traffic Arrangements.

The agreement made between the Michigan Central Rd. and the London and Port Stanley Ry. respecting the former's entrance into London, Ont., is dated Dec. 23, 1915. Under its terms the M.C.R. tracks on its terminal property in London, purchased lately from the London and South Eastern Ry. Co., but formerly leased, are to be electrified, and certain connecting tracks at St. Thomas are to be built and electrified for the purpose of facilitating the exchange of traffic at these points. The commissioners operating the L. and P.S.R. will haul between St. Thomas and London all carload freight coming from or going to the M.C.R. at London by its electric locomotives at the following rates: In trainloads of not less than 12 cars, \$3 per loaded car and \$2 per empty car; in trainloads of less than 12 cars, \$4 for each car, and \$5 if the movement is of a single car, provided that if the M.C.R. has ready and placed for movement at one time more than 12 cars the rate shall be \$3 per loaded car and \$2 per empty car. The minimum payment in any calendar year for the hauling of freight cars shall be \$25,000. All passenger traffic between London and St. Thomas is to be handled by the commission and through tickets are to be sold. The agreement is to run for 21 years, which term is to be extended to 30 years if the necessary legislation is obtained. The rates for the services performed by the commission are subject to revision at the end of each five years.

We are officially advised that the commission's staff has started work on the electrification of the M.C.R. yards at St. Thomas and London, and on the connections with the L. and P.S.R.

A St. Thomas press report, Jan. 11, states that the city council there is withholding its sanction to the laying of electrified sidings between the L. and P.S. Ry., and the M. C. Rd., on the ground of the increased danger to traffic. Sir Adam Beck, Chairman, London Railway Commission, who attended the council meeting to support the application, stated that the Board of Railway Commissioners would be asked to authorize the making of the crossings.

Canadian Pacific Ry. President's Greetings.—Sir Thos. G. Shaughnessy telegraphed from Montreal, Dec. 31, to all officers and employees: "You have my very best wishes for the new year." Among the replies received was the following:—"Greetings to yourself and family from the snow shovellers at the Chateau Lake Louise, the highest residential point in Canada. May your happiness be as great as we are high."

Grain of the 1915 Crop Moved from the Prairie Provinces by the Railways.

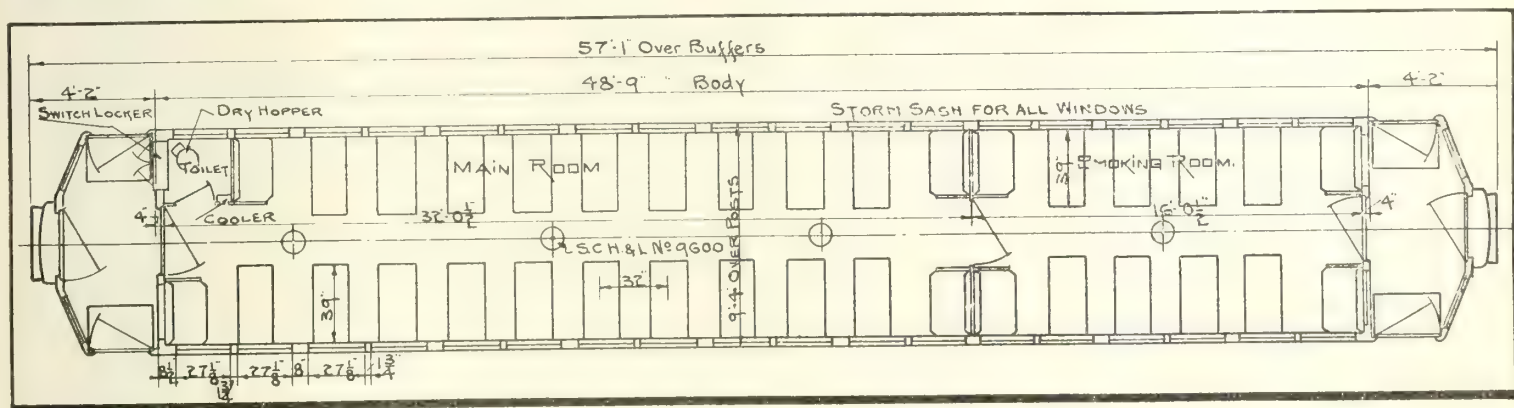
For the following statement showing the number of cars and quantities in bushels of each kind of grain carried by the different railways from Sept. 1, 1915, to Jan. 7, 1916, we are indebted to the Trade and Commerce Department.

RAILWAY	WHEAT		OATS		BARLEY		FLAX		RYE		SCREENINGS		TOTALS	
	Cars	Bushels	Cars	Bushels	Cars	Bushels	Cars	Bushels	Cars	Bushels	Cars	Bushels	Cars	Bushels
Canadian Pacific	93,194	111,832,800	10,577	21,682,850	2,719	3,670,650	945	1,086,750	47	47,000	103	103,000	107,585	138,423,050
Canadian Northern	42,363	50,835,600	7,425	15,221,250	2,155	2,309,250	334	384,100	4	4,000	21	21,000	52,302	69,375,200
Grand Trunk Pacific	21,430	25,956,000	4,035	8,271,750	368	496,800	169	194,300	5	5,000			26,207	34,925,850
Great Northern	2,329	2,794,800	75	153,750	171	230,850	18	20,700	27	27,000			2,620	3,227,100
Total	159,516	191,419,200	22,112	45,329,600	5,413	7,307,550	1,466	1,685,850	83	83,000	124	124,000	188,714	245,949,200

Passenger Cars for Lake Erie and Northern Railway.

Length over buffers (free)	59 ft.	7 ins.
Length over body corner posts....	48 ft.	9 ins.
Length of main room	32 ft.	0½ ins.
Length of smoking room	16 ft.	0½ ins.
Length between truck centres	36 ft.	9 ins.
Length between crosssties	8 ft.	0 ins.
Length between body corner post and vestibule end post	4 ft.	2 ins.
Width over side posts	9 ft.	4 ins.
Width between reversible seats ..	3 ft.	3 ins.
Width between window posts ...	2 ft.	3¾ ins.
Width of aisle	2 ft.	1 ins.

trailer cars to motor car service by simply installing the necessary wiring and equipment. The upper glass portion of vestibule side doors is movable, and the doors themselves are set out nearly flush with the side of the car. All vestibule sash are stationary and glazed with $\frac{1}{4}$ in. thick polished plate glass. Trap doors are located as shown on floor plan and actuated by coil spring balances connected to a system of levers. The vestibule side doors are arranged to open behind the trap door, the latter being provided with a suitable gray iron attached to its lower surface and forming a means of support for passengers entering the car. The vestibule steps are provided with steel sides, wooden treads and composition tread plates. Vestibule floor is formed from two layers of 13-16 in. x $3\frac{1}{2}$ in. face, tongued and grooved Georgia pine, with a layer of felt paper placed between. A motorman's mirror is installed at diagonal corners on vestibule corner post, and suitable marker lamp brackets, are let in flush with face of post at all four corners of car.



Floor Plan, Lake Erie and Northern Railway Cars.

The interior finish is carried out as follows:—Vestibule, plain mahogany; main room, plain mahogany, with inlay stripes; smoking room, plain quartered oak; ceiling, three-ply poplar veneer. A modified type of beam ceiling finish is developed for the main

room top deck in conjunction with the usual style of lower deck.

Window curtains are of pantasote, pattern silk 4-2, color 77, mounted on 1 in. diameter all-metal rollers and fitted at the bottom with spring-pinch fixtures. Sash locks are of polished bronze. All of the cars, both passenger and trailer, are provided with 27 low back walkover seats and eight stationary seats at bulkhead and end finish, all are upholstered in pantasote and each of the walkover seats is fitted with the usual corner hand grab.

The cars are wired for lights, trolley heaters, headlights and air brake equipment, same being executed in steel conduit, with the usual outlets and junction boxes. The lighting fixtures are as follows:—3 Safety Car Heating & Lighting Co.'s no. 9600, 3 lamps per fixture, main room; 1 Safety Car Heating & Lighting Co.'s no. 9600, 3 lamps per fixture, smoking room. Supplementing the above, a number of Crouse-Hinds type J.R.R.H. hoods, with Crouse-Hinds pendants no. 8294, and shade mounted type J.R.R. condulet body are located along the deck sill. Each vestibule is provided with one Crouse-Hinds 3 light vestibule lamp equipment, consisting of type K.R.Y.A. reflector holder, S.H. 25 reflector and norbitt receptacle C-227. Furthermore, there are four bracket lamps on each side of main room, two each side of smoking room and one in the lavatory. Lighting control in vestibules is carried out by the use of a two-way switch so that the fixtures can be thrown on and off alternately. The line voltage is nominally 1,500 volts d.c., and as shown above there are 12 body centre lamps, 4 fixtures 3 lamps each, in conjunction with 3 vestibule lamps, or a total of 15 lamps per circuit, which allows 100 volts per lamp on a series basis. Consolidated Car Heating Co.'s electric heaters are used as follows:—26 no. 392 T for body, and 2 no. B. 4722 F. control switch no. 313 (three position).

Each vestibule is furnished with a polished bronze conductor's signal bell, having operating cord attached. Each seat is fitted with an annunciator push button, wiring for same being provided with a cut-out switch. Eight basket racks are installed in main room, and two in smoking room. Emergency tools, consisting of axe, saw and sledge are placed in body, accessible for immediate use. Coat and hat hooks are located at each wide pier in body of car. Motorman's steps are secured to body corner post on diagonal corners of car, also grab handles at each door opening as required.

The painting throughout was provided for in the following manner:—Steel work, one coat of red lead; bottom framing and underside of flooring, one coat of red oxide; top of flooring, two coats of paint and oil; exterior of body, builders' standard formula Fullman new body color; lettering and numbering, gold leaf; interior, finished natural (no shellac used), rubbed down to a dull finish; ceilings, gloss finish.

The cars have been built by the Preston Car & Coach Co., Ltd., Preston, Ont.

The Canadian Westinghouse Co. has supplied six 1,500-volt quadruple car equipments, equipment for two trailer cars, and new universal air brakes for both motor and trailer cars. Each of the six 1,500-volt motor car equipments will consist of four 85 h.p. ventilated type motors and AB unit switch type of control. Ordinary wheel trolleys will be used at first at least, but the cars are so arranged that pantagraph trolleys can be installed in place of the wheel trolleys, or as auxiliaries. The trailers will be equipped with control apparatus, so that a train may be operated from any platform without switching the cars.

The trucks weigh 12,800 lbs. each, or a total of 25,600 lbs. per car. The air brake equipment weighs 2,800 lbs., including the compressor. The electrical equipment in-

cluding control and wiring, weighs 17,000 lbs., and the bodies complete weigh 34,725 lbs., which gives a total car weight without passengers of 80,125 lbs.

St. Clair Tunnel Electrification Operating Data.

The Grand Trunk Ry. tunnel under the St. Clair River between Sarnia, Ont., and Port Huron, Mich., was electrified in 1908. The electrification was fully described in Canadian Railway and Marine World, Dec., 1908.

The system is single phase, 3,300 volts, six 66 ton Westinghouse locomotives being used. Two coupled together haul 1,000 ton trains up the 2% grades encountered in the tunnel at 10 m.p.h. Electric operation has made it possible to handle fully one third more trains than was possible with steam operation, and has eliminated danger from gas.

Through Walter D. Hall, Superintendent of the tunnel, information regarding the results of six years of electrical operation of the tunnel has been made available. He states that the steam locomotive men who, after a few weeks of training, were put in charge of the locomotives are still operating them and, with two exceptions the same firemen, now called assistants, are with them. Not a passenger or member of the yard crew has been injured by electric shock and but two casualties have occurred to workmen in the electric bay of the shops.

The average cost per year for maintenance of the six electric locomotives has been \$11,131 as compared with \$21,173 for the four steam locomotives which they replaced. The average cost per car handled through the tunnel, a distance of about 5 miles, was 17.22c. compared with 26.64c. with steam locomotives, although the capacity of cars handled today is much greater than that of the cars of 1907 and 1908. The electric locomotives are available for service about 90% of the time. The total yearly locomotive mileage for the six units averaged 208,810, or 34,800 per unit.

The commutators make from 60,000 to 99,480 miles between turnings and the brush mileage is from 40,000 to 60,000. The pinion mileage is from 64,000 to 118,000, and none of the gears have worn out in 254,000 miles of service.

Formerly the greatest mechanical expense was due to flange wear, the average mileage between tire turnings being 25,000. Since the installation of electro-pneumatic flange oilers, the invention of Mr. Hall, some tires have already made 184,000 miles since last turning, and are still in service. Tires which formerly made 12,000 miles now reach 83,000 between turnings.

The few train delays which have occurred were due mostly to insulator failures or flashovers caused by the steam locomotive exhaust. At first some short circuits were caused by birds which alighted on the arcing tips of lightning arresters, but this cause of trouble was removed by installing porcelain perches over the arcing tips. Such strain and special insulator failures as occurred were apparently due to expansion under the effect of temperature changes. Strain insulator trouble has been overcome by the use of fibre "shrouds" which protect from rain and steam locomotive gases. The tunnel insulator design was also improved by increasing the amount of insulation between wire and ground and making broken insulators more readily replaceable. A steel contact wire was also placed below the copper wire to reduce the rate of wear.

The wood section breakers gave some trouble due to warping. These have been removed and an overlapping arrangement of the contact wires has been substituted.

The wire hangers of ¼ in. pipe proved satisfactory except where subjected to steam locomotive gases in the yard. In such places ½ in. x 1 in. galvanized or sherardized steel band has been used when hangers needed replacing. A special hanger or universal trolley wire clamp was devised by Mr. Hall for use in supporting the iron contact wire. This consists of two grooved plates, held together by one carriage bolt with provision for attaching a band iron hanger by means of which the clamp with attached wires can be supported from messenger wire or insulator.

The average cost of maintenance per mile per year of the 12 miles of overhead construction and rail bonding was \$127 for labor and \$72 for materials and tools. The saving in the cost of track maintenance in the tunnel is estimated at \$1,500 a year.

The cost of fuel for the steam locomotives was \$42,729 a year, while that for the electric locomotives was \$17,186, with the electric locomotives handling a greater tonnage. While slack coal is used in the power plant in place of the hard coal formerly used on the locomotives, fewer tons of the former are consumed. The energy cost given also includes energy supplied for operating pumps, for tunnel, terminal, yard and engine house lighting and for crane and other motors. The average watt-hours per ton mile at the generator busbars were 37.6.

An interesting indicating device has been installed in the boiler room to supplement the automatic device used to adjust the rate of fuel consumption to the load. The latter consists of a diaphragm valve in the fan engine line, which controls both the fan speed and the engine speed through variation in boiler pressure. There are times when trains follow each other in such quick succession that it is not advisable to wait for the steam pressure to drop in order to bring in the auxiliaries. A coil was therefore placed around the cable feeding the contact wire and the induced current was utilized for ringing a bell and lighting lamps when a train requiring 800 kw. or more moves out of the yard toward the tunnel. This indicates to the fireman that he should prepare to handle a heavy train up the 2% grade in 3 or 4 minutes. He can then cause the fan and stokers to speed up and be ready in ample time to care for a heavy load.—Electric Railway Journal.

Sandwich, Windsor and Amherstburg Ry.'s Franchise.—The Ontario Legislature is being asked by the Windsor City Council to limit the duration of the franchise of the company as to supplying electric energy for lighting, heating and motive purposes within the city under the bylaw of 1892, and the further bylaw of 1896, by providing that the franchise and all the powers granted thereunder shall cease after Dec. 31, 1922, that being the date of the expiration of the company's franchise for the operation of its electric railway in the city.

The Shawinigan Water and Power Co. is asking the Quebec Legislature to authorize it to acquire and deal with the shares and securities of other companies, to carry on all kinds of manufacturing business, to guarantee the performance of contracts, etc. The company owns, among other things, the Three Rivers Traction Co., and the Shawinigan Terminal Ry.

British Columbia Electric Railway Company's Annual Report.

Following are extracts from the report for the year ended June 30, 1915, presented at the annual meeting in London, Eng., Dec. 30:

Owing to adverse circumstances the result of the year's operations is exceedingly unsatisfactory. The period in question has been one of continuous difficulty and anxiety to the directors and the management in British Columbia. The following charges have been made against the revenue account for the year,—

Provision for renewals maintenance	£167,888	3	7
Addition to capital amortization fund	2,553	10	7
Provision for income tax	10,000	0	0
	£180,441	14	2
The net revenue for the year, after making the above deductions, amounts to	£180,661	10	4
Add—			
Balance brought forward from last year	6,884	7	7
Amount transferred from reserve fund	60,000	0	0
	£247,545	17	11
Deduct—			
Interest on debentures and debenture stock to June 30, 1915	£132,879	4	6
—Dividends already paid—			
On 5% cumulative perpetual preference stock for year to June 30, 1915	72,000	0	0
On preferred ordinary stock for year to June 30, 1915, at 2½% per annum	36,000	0	0
	£240,879	4	6
Leaving a balance to carry forward to next account of	£6,666	13	5

In order to make the above dividend payments it has been necessary to transfer £60,000 from the reserve fund.

Owing to the war and especially to the resultant paralysis of the shipping trade commercial depression of the most acute severity has prevailed throughout British Columbia, which has brought about an almost complete cessation of expenditure by the Government, municipalities, railways and other large undertakings. This depression has been responsible for a decrease in population, estimated at about 30%, in the districts served by the company. The spending power of the remaining population has been reduced, and a general tendency to economize has resulted. As one result of the depression a very serious difficulty arose at the beginning of 1915, when the company had to meet an extraordinary form of competition from privately owned motor cars which started plying for hire at ordinary tram fares in opposition to the company's cars. The directors have already issued circulars to the stockholders drawing their attention to the fact that these motor cars, which are called jitneys, are allowed by the authorities to compete with the company on a very unfair basis. Strict regulations and limitations as to frequency of service, accommodation and construction of cars are imposed upon the street car service in order to secure the safety, comfort and convenience of the public, whereas these motor cars are allowed to run practically unregulated in these respects, paying no percentage of their receipts to the cities and without contributing to road maintenance. To meet this jitney competition, the company, some months ago, reduced some of its fares as an experiment. The results of this experiment have been disappointing, and other measures are being adopted to cope with the situation. It has been proved that cities of the size of those served by the company cannot support a thoroughly efficient and convenient electric railway service and also an unrestricted service of jitneys. At the present time the tramway service is run to a regular schedule. It serves all districts, including outlying ones, at all hours, regardless of whether such service is profitable or not. The inhabitants will therefore have to

choose whether they will retain the present tramway service, or whether they prefer the unregulated service of jitneys, coupled with a very much curtailed service by the tramways, which would necessarily be restricted to the actual requirements of present business and would also be restricted to routes and districts which were profitable to operate.

The depression and jitney competition combined have rendered it impossible for the company, notwithstanding the most

rigid economy, to operate the street railway system at a profit. In order to meet the new conditions, the most determined efforts have been made by the board and management to curtail expenditure in every direction. The General Manager has been compelled to reduce and carefully reorganize the staff in British Columbia, but the directors are satisfied that the present managing staff is carrying on the business of the company in a thoroughly efficient manner. During the financial year operating and all other expenses of the company have been drastically reduced, but the full effect of these economies is not apparent from the accounts now submitted to the stockholders. On June 30, 1915, the wages agreement between the company and its employees terminated, and the board of arbitration made an award, reducing the rates of wages paid to the employees by about 8½%, which will represent a saving of about £22,000 per annum. The General Manager estimates that the various economies put into force during the current year, together with the reduction in wages, will amount to a reduction in expenditure, as compared with the year ended June 30, 1914, of very nearly £200,000, and he states that this will be accomplished without in any way affecting the efficiency or general upkeep of the plant or the public safety. Unfortunately against this economy there is a decrease in gross earnings during the first four months of the current year of £124,147. For the purpose of comparison, it must be borne in mind that during the corresponding four months of last year the jitneys had not commenced to compete and the full effect of the war had not been felt.

In reviewing the work which has been accomplished during the year, the General Manager reports that the company's plant has never been in a higher state of efficiency, and the company is in an excellent position to profit by an improvement in business conditions when the war is over. £167,888 3s. 7d. has been set aside out of earnings for renewals maintenance. This charge is calculated upon a fixed basis settled some years ago, and the board have determined to adhere to this basis. The charge is a heavy one to provide in times like the present, but provisions of this char-

acter make for a sound financial status. The expenditure on capital account during the past year by the company and its subsidiaries has been \$875,558, against \$4,110,327 for the previous year. Practically the whole of this expenditure relates to works authorised and entered into some time prior to June 30, 1914.

In considering capital expenditure, it is necessary to remember that the population of newly developed countries fluctuates to a considerable extent and that such countries are susceptible to the extremes of prosperity and depression. It is, therefore, impossible for a public utility company always to provide the plant and equipment that is precisely adequate to the requirements of the moment. For many years the company was altogether unable to keep pace with the needs of the communities which it served. The records of the company show that serious risks were then being taken as the company had absolutely no reserve of generating plant, rolling stock and equipment. This gave rise to continual complaints from the authorities and the population, on the ground of overcrowding and breakdowns of service. Moreover, dissatisfaction was expressed because the company was not extending its services to new districts, and that it was failing to carry out the obligations which devolved upon it in view of the special privileges which the company enjoyed in these districts. Careful estimates as to future developments were made by the board, based on the reports of highly qualified experts, and power plants were laid down to meet the needs of the rapidly growing communities; the tramway and lighting systems were laid out on a similar policy. The provision made was very much below the demands of the municipal authorities and others, and due allowance was made for a probable temporary set back, such as occurred in the financial year ended June 30, 1914, and which had actually been anticipated by the board. The directors, however, did not contemplate a European war, and they are confident that, if it had not been for that catastrophe, the provision for the future development of the districts served would not have been more than sufficient for the actual needs. As it is the company will probably have for some time a general equipment considerably in excess of immediate needs, and it may have to face a delay of some years in the development which would, but for the war, have taken place in the Province. At the same time, the company is now undoubtedly in a very strong position to take advantage of the revival in business when it extends from the eastern part of Canada to the western coast.

Without in any way minimising the difficulties which will have to be met in the next few years, the directors feel that they can congratulate themselves and the stockholders upon the strong financial position in which the company stands. It had on June 30 the following liquid assets:—marketable securities (at cost), £105,000; short loans and cash in hand, £418,876; total, £523,876. Since that date the liquid resources have increased. Although there is no immediate prospect of sufficient profit being earned to pay the dividend on the 5% cumulative perpetual preference stock, the directors are of opinion that the company's financial position justifies the payment of the dividend for the current year out of the reserve fund, and a resolution will be submitted to the stockholders to approve of this course being adopted. The directors are unable to hold out any hope that they

will be able to recommend the payment of any dividend on the preferred ordinary or deferred ordinary stocks for the current year.

Shortly after the outbreak of the war the company made substantial contributions to a local patriotic fund, and also gave the military authorities transportation concessions during mobilisation. A canvass was made of the employes and nearly all the office staff and many of the outdoor staff agreed to contribute 1% of their salaries each month to the patriotic fund so long as the war lasted. These contributions amounted up to Oct. 30 to \$12,763. When the last war loan was issued the directors, in view of the large liquid resources, subscribed for £100,000 thereof, which has been paid up in full, and is now held by the company as part of its liquid assets. Although it is somewhat unusual to make a reference to any matter which does not strictly relate to the company's business, the directors desire to make fitting reference to the magnificent response of Canada to the call of the Empire, and to the glorious deeds of the Canadians at the front. The company's staff, both in British Columbia and London, has contributed its quota to the Canadian and British forces, and the directors desire to extend their sympathy to the relatives and friends of those who have given their lives for the country.

In considering the situation the directors realise the severe disappointment of the stockholders at the present results and the hardship imposed on many of them, but they wish to warn them against undue pessimism. The directors remind the stockholders that a young country in the geographical situation of British Columbia feels the effect of the war far more acutely than an old country like England, and, on the other hand, British Columbia, with its magnificent and scarcely developed natural resources, should recover far more rapidly than older countries. In his last report, the General Manager states:—"I wish to record my faith, which is shared by every member of the management, in the future, both of the territory we serve and of the undertakings we are operating. All we ask is reasonable time in which to readjust the business to changed conditions, requiring patience on the part of the proprietors."

The directors again have pleasure in expressing their appreciation of the loyal and satisfactory service rendered by the management and staff in British Columbia under difficult and disheartening conditions.

A comparative statement, appended to the report, shows the number of passengers carried for the years ended June 30 as follows:—1912, 385,846; 1913, 401,836; 1914, 410,229; 1915, 201,768.

The following expenditures on appropriations of capital account were made for the year ended June 30, 1915:—

Rolling stock.....	\$128,201.10
Permanent and double tracking and sundry improvements.....	139,129.79
Track extensions.....	27,595.40
Lighting and power extensions.....	8,470.03
Steam plant.....	19,161.21
Land and buildings.....	260,377.74
Electrical machinery.....	89,938.17
Extending light and power system.....	39,095.80
North Vancouver — Rolling stock, meters, transformers, and initial installations.....	252.62
Sundries.....	19,113.58
Transmission lines and railway feeders.....	8,108.57
	\$701,121.59

The Athabasca Power Co., Ltd., has been incorporated under the Dominion Companies Act, with \$100,000 capital and office at Winnipeg, to carry on business as a light, heat and power company, and to own and operate steam and sailing vessels of every description.

The Jitney Situation in Canada.

The Three Rivers City Council is applying to the Quebec Legislature for power, among other things, to regulate or prohibit autobus traffic within the city limits.

The contract with the Canadian Autobus Co. has been again before the Montreal City Council. At a meeting of the Board of Control the City Attorney was asked to advise the Board definitely as to its power to enforce the carrying out of the franchise agreement.

It was reported recently that there were only 11 jitneys operating on Yonge St., Toronto, against over 700 some six months ago. The residents of North Toronto, on Jan. 14, entered a protest against the regulations, which they contend are driving the jitneys out of business, and they claim that the jitney is a necessity to them.

The Edmonton, Alta., City Council, on Jan. 4, gave a second reading to a new bylaw for the regulation of street traffic, and referred it to a committee. The bylaw has not been published, and its probable effect on the jitney traffic is not known.

About 150 jitney licenses for 1916 had been issued by the Vancouver City Council to Jan. 8, but it is reported that there are some jitneys being operated for which new licenses have not been taken out. In 1915 459 licenses were issued.

The Victoria, B.C., City Council, on Jan. 4, appointed examiners of jitney drivers for the current year. It is proposed to amend the jitney bylaw by providing that a driver once having received the proficiency certificate shall not be required to secure another, so long as he remains continuously a licensed driver.

Concrete Poles for Electric Railways.

The American Electric Railway Association's Committee on Power Distribution presented a report at the convention in San Francisco recently in which it summarized its tests and experience of several years as follows:—

Failure of a pole is always due to stretching of the reinforcing rods on the tension side.

A failure is always preceded by the appearance of hair-line cracks in the concrete on the tension side, at rather frequent and regular intervals from the ground line up.

It is advantageous to use a high grade of reinforcing steel to secure the maximum tensile strength.

Plain round reinforcing rods are essentially as satisfactory as twisted or other rough rods, because in general the rods will elongate before they slip in the concrete.

A large number of small rods is preferable to a smaller number of large rods, as a better distributed reinforcement may be secured for a given amount of steel and a greater bonding contract surface is presented to the concrete.

The reinforcement need not be uniform throughout the length of the pole, but may be stepped off as the top of the pole is approached.

A pole with uniform reinforcement will break at the ground line, while one with tapered reinforcement will break at some point above the ground, depending on the taper of the reinforcement.

A concrete pole has an element of safety in it, as a failure of the pole will not in general allow it to fall to the ground. It is difficult at times to pull over a pole after failure, even though it is inclined at a large angle from the vertical.

The committee presented complete specifications for manufacture of reinforced con-

crete poles, from which the following is condensed:—

Weights—Variations in weights of poles shall not exceed 5% over or under the weights specified in the order.

Reinforcement—The area of reinforcing rods shall constitute practically 3% of the cross-sectional area of the pole at the ground line, and shall be made up of 16 reinforcing bars placed as shown. The modulus of elasticity of the reinforcing steel shall be at least 30,000,000.

Pole Attachments—Holes shall be provided in the pole for steps, cross arms, span wire attachments, bracket arms and other fixtures.

Test—One per cent. of the number of poles (minimum of one pole) may be tested to destruction, and 10% of the total number of poles may be tested for deflection with the specified loading, all at the expense of the contractor. Any additional testing that may be required by the company shall be at its expense. The poles to be tested may be selected by the company.

Rejection.—The failure of 40% of the poles tested to meet the requirements as herein specified shall be sufficient cause for rejection of the entire order.

Regina Municipal Railway Held Liable for Damages.

A Saskatchewan court has, under the Workmen's Compensation Act, awarded \$2,000 damages to the widow of T. F. Cook, an employe of the Regina Municipal Ry. who died as the result of injuries received Oct. 14, 1914, while engaged in the uncoupling of "hauling" cars. A common law action was originally brought, and on May 13, 1915, a jury found for the plaintiff on a number of points, fixing the damages at \$5,000. As the jury found there was contributory negligence on Cook's part it was held there was no liability for damages, and in June, 1915, action was brought under the Workmen's Compensation Act. Judge Newlands gave judgment, Dec. 29, against the city's contention that the action had not been brought immediately, holding that under all the circumstances it had been brought as soon as possible; that the plaintiff's rights were fixed by the act, and there was, therefore, no actual necessity for the setting out of the matter on the statement of claims.

The chief point raised was that the act does not apply to injuries received on a municipal street railway. The judge said: "The last objection is based on subsec. 1 of sec. 3 of the act, which says: 'Railway means a road used by a private person or public company on which,' etc. Mr. Blair claims that a municipality is neither a person nor a public company. He apparently interprets the word 'used' as meaning 'owned or operated.' 'Used' does not mean either of those things, and if I give it its ordinary meaning, which I think I must, the Regina Municipal Railway is certainly used by private persons. As deceased received more than \$2,000 in the three years preceding the injury, I fix the compensation at that amount. Costs in the successful proceedings are awarded the plaintiff, except in so far as they are increased by any part of the proceedings that fail, and the plaintiff ought to bear all costs occasioned by such failure."

Heavy snow caused a suspension of street railway traffic in Brandon, Man., Jan. 10, and it was anticipated that several days would elapse before the streets were sufficiently cleared to permit cars to be again operated.

Electric Locomotives for Lake Erie and Northern Railway.

The L.E. & N.R. has received one of its 60-ton electric locomotives and the second is expected to be shipped by March 31. The principal dimensions are as follows:

Gauge, 4 ft. 8½ ins.
Distance between truck centres, 17 ft. 8 ins.
Wheelbase, each truck, 6 ft. 8 ins.
Wheelbase, total, 24 ft. 4 ins.
Driving wheels, diameter, 36 ins.
Journals, 5½ x 10 ins.
Width over all, 10 ft.
Height to top of cab, 12 ft. 0½ in.
Height over all, 12 ft. 10 ins.
Length, centre to centre of coupler knuckles, 37 ft. 6¼ ins.
Weight, 120,000 lbs.

voltage across each is 750 volts. Their nominal rating is 75 kw. (100 h.p.).

The frame is of soft steel, cast in a single piece. The projections of the frame, to which the axle caps are bolted, extend over the axle, to a large extent relieving the axle cap bolts of the weight of the motors. At each end there is a large bored opening through which the armature, pole pieces and field coils may be removed. These openings are enclosed by housings, which will carry the bearings and oiling arrangements and are securely bolted to the frame. Tapped holes are provided in each housing

preventing vibration and chafing, and are protected from abrasion by metal coil shields.

The commutating poles are of steel and are bolted to finished seats. The coils are wound, insulated and prevented from vibrating in substantially the same manner as the main field coils.

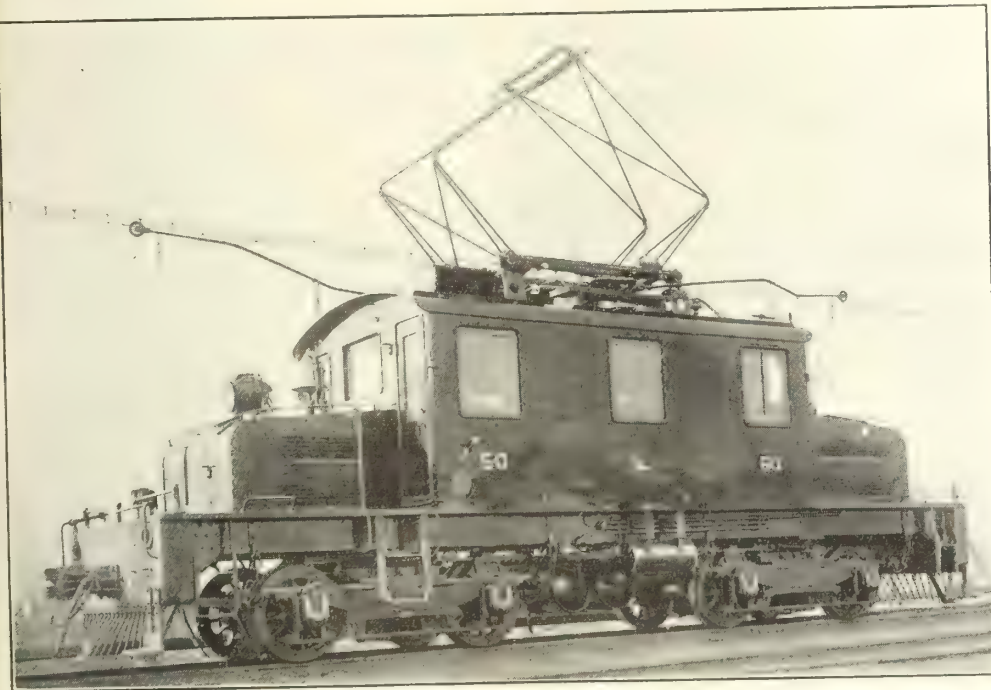
The brushholder is readily accessible for adjustment, cleaning and removal of carbons. Each holder is supported by two insulated pins, over which are placed porcelain bushings, which give a large creepage distance between the holder and the motor frame. The holders are arranged for radial adjustment to allow for wear of the commutator. The proper brush tension is provided by an adjustable spiral spring. A flexible shunt protects the springs for excessive current.

Both armature and axle bearings are arranged for oil and waste lubrication. Large waste pockets are provided having an opening into the low pressure side of the bearings. Separate oil reservoirs permit the fresh oil to be fed and filtered up through the waste to the bearing. The depth of oil in the reservoir may be easily gauged, so that the most economical height may be maintained. Oil guards and wiper rings prevent the oil from reaching the inside of the motor.

Two separate field windings are used on the main poles. By connecting the two field windings in series during acceleration, a relatively high tractive effort at low speed is secured with a small current. After all the resistance has been cut out, one of the field windings is cut out reducing the total active field turns. This gives a higher speed at any given current. While the full field connection is intended primarily for acceleration, it may be used to some extent for slow-speed running.

The motors have a unique system of ventilation. While air for cooling is normally provided by a motor driven blower, each motor has a fan at one end of the armature which will provide sufficient ventilation to operate the locomotive at three-quarter capacity in case of accident to the blower.

The control equipment used on the locomotives is HB electro pneumatic and is practically the same as the high voltage



These locomotives are of the 8-wheeled, double-truck type, so equipped that they can be used in passenger, freight or switching service. They will operate on 85-lb. rails, traversing curves of 40 ft. radius without a trailing load and of 130 ft. radius with a trailing load. In service they will handle standard freight cars and Canadian Pacific passenger cars, the maximum train load being about 800 tons.

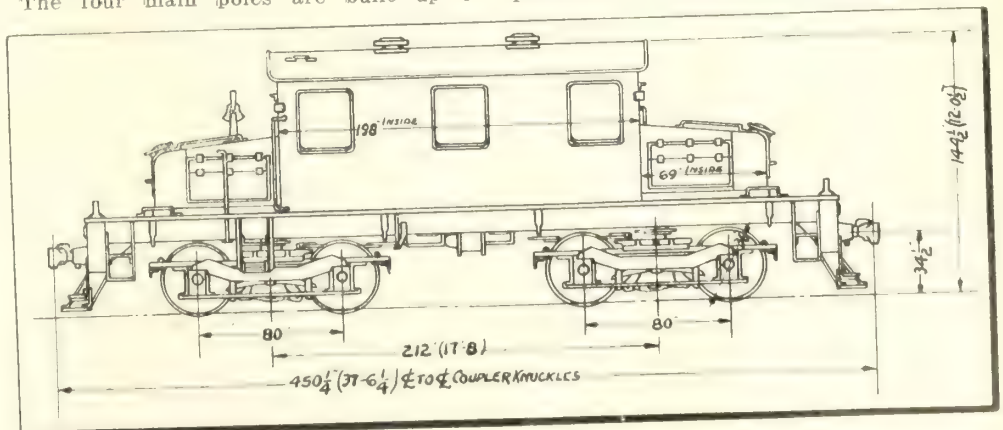
The trucks are of the equalized pedestal type, with rigid bolsters and half elliptic springs. This design of truck, it is claimed, combines simplicity of construction with ample strength, and with riding qualities which are satisfactory for locomotive service. The wheels are steel tired, with cast steel centres. The longitudinal frame sills consist of four 13-in. steel channels, which are strongly braced transversely above the truck centre pins. The bumpers are of cast iron, with push pole pockets, and are made in one piece with heavy lugs which are riveted to the frame sills. This provides a most substantial frame structure. Iron pilots and short shank M.C.B. couplers are applied at each end.

The locomotives are arranged for double end operation and they have central cabs with sloping hoods at either end. The cab is of steel, and is lined with wood for the comfort of the enginemen. Steps and handholds are arranged to conform to the Board of Railway Commissioners' requirements.

The motors are of a new type, styled 562-D-5, which has been developed by the Westinghouse Electric & Mfg. Co. for high potential direct current. Two motors are permanently connected in series so that the

for use in removing it. Access to the commutator and brushes is afforded by a large opening over the commutators. The cover is held by a tee bolt at one end and a locking device at the other. Tapped drain holes are provided through the bottom of the frame.

The four main poles are built up of



lamination of soft steel, riveted between end plates. The main poles are secured by studs extending through the frame and fitted with easily accessible nuts. The field coils are wound with flat copper strap, insulated between turns with asbestos ribbon. The outside is protected by a covering and the entire coil is impregnated with a heat conducting and water proofing insulating compound. The coils are held rigidly against the pole tips by stiff flat springs,

control outfits used on the motor cars.

The various main circuit connections are made by individual or unit switches, arranged compactly in a group, these switches being operated by compressed air. The magnet valves governing the flow of air to the switch cylinders are actuated by low voltage current from a storage battery. The switch group consists of a number of unit switches in a common frame. Each switch is provided with a powerful magnetic blow

out coil, which effectually extinguishes the arc whenever the switch is opened. The switches are normally held open by strong coiled springs, contained in the cylinders and are closed against the action of the springs by compressed air. Since the air under normal pressure exerts a force approximately double that of the spring, the action of the switch in either opening or closing is always quick and positive.

The master controllers are located at either end of the locomotive cab. Two levers are provided on the master controllers, one for notching up and one for reversing. The reverse lever is mechanically interlocked with the operating handle, so that it cannot be thrown unless the main drum is in the off position. There are four running positions on the drum, together with seven resistance notches in series and five in parallel. The running positions are short and full field in series and short and full field in parallel.

With forced ventilation, the motors and auxiliary apparatus has sufficient capacity to enable the locomotives to exert continuously a tractive effort of 9,200 lbs. with an average of 600 volts at each motor. With 750 volts at the motors the locomotive is able to exert a tractive effort of 13,800 lbs. for one hour at approximately 14 m.p.h. With 25% adhesion the locomotives are able to exert a maximum effort of 30,000 lbs. Their maximum speed is 40 m.p.h.

The equipment includes Westinghouse air brakes, which can also be operated by hand; air signal; one foot gong; two air whistles and a locomotive bell with air ringer.

The locomotives were ordered from the Canadian Westinghouse Co. and were built in the Westinghouse works in the United States.

Additional Cars for Toronto Civic Railway.

The City of Toronto Works Department has received tenders for the supply of 13 semi-steel, double end, double truck, city cars, to be delivered in knock down shape at the Danforth Ave. car barn, where they will be assembled. Contracts will be awarded under six separate heads, viz., car bodies, trucks, motor equipment, air brake equipment, wire and cable, and fare boxes. The general dimensions of the car bodies are to be as follows,—

Length over corner posts	31ft. 8 ins.
Length of each platform from outside of end sill to outside of dash, on the centre line	7 ft. 8 ins.
Length over bumpers	47 ft.
Maximum width at drip rail	8 ft. 6 ins.
Width over posts at belt rail	8 ft 4½ ins.
Height from top of rail to top of trolley board	11 ft. 8½ ins.
Truck centres	19 ft. 8 ins.
Driving wheels, cast iron	33 ins.
Pony wheels, cast iron	21 ins.
Truck wheel base	4 ft 10 ins.
Seating capacity	48
Motors per car	2
Speed, including stops, miles per hour	11
Minimum centre radius of horizontal curves	35ft.
Approximate weight	20,000 lbs.
Height of steps, top of rail to top of first step	14 ins.
First step to platform floor	12¼ ins.
Platform to body floor	10¼ ins.
Ramp in floor from end sill to bolster	3 ins.
Body floor to top of rail	3 ft. 3½ ins.

It is specified that the body bolster shall be designed to carry a safe load of 11,000 lbs. at each end when supported in the centre, allowing a safe unit stress in tension at the outer fibre of 12,500 lbs. per sq. in. The side bearings, to be of approved design, are to be mounted 26 ins. on each side from the centre of king pin, which is to be supplied by the builder, the centre plate of approved design to be furnished by the truck builder. Cars will

be supplied with cast steel pull couplers bolted to centre platform knees. The inside finish will eliminate all corners where dust and dirt are likely to accumulate. The interior finish will be no. 1 red cherry. The side sheathing will be a 9-64 in. plate with top, bottom and intermediate stiffening. Side posts will be of ash, notched out to give air circulation between panels, and be bolted to side girder. The interior finish below bolt rail will be cherry veneer with a layer of tar paper inside. The roof framing will be of the plain arch roof type, covered with tongued and grooved poplar sheathing and 8 oz. cotton duck.

The door operating mechanism will be arranged so that the step will drop into place as the door opens, and will fold as the door shuts, and the doors will be arranged to lock in position when either open or closed. Four automatic ventilators will be provided on each side of car, with openings 5¼ by 7¼ ins. The general equipment is to include four straps over each longitudinal seat, with celluloid hand hold, Consolidated Car Heating Co.'s push button buzzer system of the trolley operated type, signal bells, forced draught heaters, foot gong, motorman's seats, Crouse-Hinds type Z headlight at each end, Coleman no. 4 stationary fare box at each end, H. B. life guard at each end, trolley catcher at each end, fire extinguisher, sanding apparatus, etc. The seats, of which there will be 16 of the walkover type arranged crosswise, and 4 longitudinally, will be of cherry, with sandboxes, lockers, etc., under the longitudinal seats. The air brake equipment is to be of General Electric type with C.P. 27B compressor, and the motor equipment of Canadian Westinghouse type with no. 533 fully ventilated interpole box frame street railway motors and K. 51 A controllers arranged for field control, etc.

In addition to tenders for the supply of the necessary materials to enable the Works Department to assemble the cars at the car barns, separate prices for the assembling of the parts and the installation of the equipment are also under consideration.

London and Port Stanley Railway Earnings.

Following is a statement for six months ended Dec. 31, 1915, as supplied by the Auditor and Treasurer, J. E. Richards. The figures include the actual receipts and expenditures for the first five months, December being estimated the same as for November:—

REVENUES.			
Passenger	\$63,758.34		
Freight	78,456.23		
Miscellaneous	3,523.27		\$145,737.84
OPERATING EXPENSES.			
Miscellaneous	\$1,111.60		
Power	17,949.60	\$99,061.20	
FIXED CHARGES.			
Interest	18,778.18		
Sinking fund	4,139.52		
Rental	10,000.02		
Taxes	3,481.32	\$36,339.00	\$135,460.20
Net earnings			\$10,277.64

Brantford Municipal Railway Commission.—Brantford, Ont., ratepayers, at the municipal election, Jan. 3, elected C. H. Hartman, W. R. Turnbull and F. J. Calbeck as the commission for 1916. Messrs. Hartman and Turnbull were commissioners last year, and Mr. Hartman headed the poll this year, although he strongly opposed the sale of the Paris-Galt section of the Grand Valley Ry. to the Lake Erie & Northern Ry., which the ratepayers authorized by a majority of some 300. A. K. Bunnell, City Treasurer, who was a commissioner last year, was defeated.

The Edmonton Power Company's Railway Project.

For some time past there has been considerable speculation in Edmonton, Alta., as to the plans of the Edmonton Power Co., which is seeking to obtain a franchise for the supply of electric power in Edmonton at a price which would compete with the plant owned by the city. After considerable agitation a bylaw was submitted to the ratepayers in Nov., 1915, authorizing the granting of a franchise, and was approved. The city council, on Nov. 24, refused to give the bylaw a third reading pending certain modifications in its terms, and on Dec. 7 an interim injunction was obtained to restrain the council from passing it. A local court, on Dec. 10, dissolved the injunction, holding that the bylaw was merely an agreement to grant a franchise, which must have the sanction of the Alberta Legislature before it could become operative. The bylaw again came up for consideration by the city council on Dec. 24, when it was approved by a vote of 7 to 4. Three aldermen protested against its passing, and the Mayor said that he would not sign the agreement; that he had put the motion before the council, as he was compelled by law to do, but that he would not go any further.

At the same meeting an intimation was given that application was given for the incorporation of a radial railway company in connection with the company's power development project, under the title of the Edmonton and South Western Ry. Co. The notice of application to the Dominion Parliament respecting this company states that power is desired to build a railway from Edmonton southwesterly to the Saskatchewan River, near Blue Rapids, 70 miles, together with telegraph and telephone lines, and with power to use part of its right of way for a power transmission line. It is asked that the railway be declared to be an undertaking for the general advantage of Canada, and that the company have power to enter into agreements under the terms of sec. 361 of the Railway Act with the Grand Trunk Pacific Ry., the Canadian Northern Ry., and the Canadian Pacific Ry., or any of them. Pringle, Thompson, Burgess and Cote, Ottawa, are solicitors for applicants.

A local newspaper article respecting the company's power development plans states that the project has been under investigation for about three years by Sir John Jackson, Limited, a British firm of engineers and contractors, that the site of the proposed dam is on the Saskatchewan River, about 65 miles southwesterly from Edmonton, but considerably further by the river, that the dam will be 1,500 ft. long, and 105 ft. high, and will make an artificial lake of 60 square miles, that the power plant development is estimated to cost \$6,000,000, that for the purposes of the company a 65 mile railway will be built to the power plant site, by an independent but apparently associated company. The route through which the railway is projected is reported to be fairly well settled, and should offer considerable opportunities for further settlement. G. W. Farrell and Co., Montreal, who are interested in the project, state that they are unable to give any information as to the company's plans until after legislative sanction has been obtained.

The Regina, Sask., City Council has appointed Aldermen Wilson, Baker, Black and McInnes as its street railway committee for the current year.

Electric Railway Projects, Construction, Betterments, Etc.

Buffalo, Fort Erie Ferry and Rd. Co.—The Ontario Legislature is being asked to incorporate a company with this title to, among other things, acquire by lease or otherwise the right of way, rolling stock and all such other assets as may seem desirable, formerly owned by the B., F. E. Ferry and Ry. Co., and to operate the railway now terminating at Fort Erie, Ont. Authority is also being asked to extend the line from Fort Erie to any part of Point Abino, in Bertie Tp., to Port Colborne; through the eastern part of Bertie and Willoughby Tps., with a branch line from Crystal Beach to Ridgeway. F. V. R. Bardoe, 400 D. S. Morgan Building, Buffalo, represents the company, and Fasken, Cowan, Chadwick and Rose, Toronto, are its Canadian solicitors. The company, it is said, has been reorganized recently. (June, 1913, pg. 286.)

The Chestermere and Calgary Suburban Ry. Co. was incorporated by the Alberta Legislature in 1910, to build a railway to be propelled by electricity or any other motive power from Calgary to Chestermere Lake, 12 miles. The lake is an artificial one, having been created by the C.P.R. irrigation canal flowing into it, and the project was understood to be connected with a number of real estate development plans, as the route proposed was a somewhat circuitous one, through various subdivisions which were then being put on the market. The provisional directors were:—G. E. Tudor, J. A. MacCullough, A. J. Samis, E. F. Ryan, Calgary; G. B. Tudor, Cleveland, Ohio. We are informed that between three and four years ago some light grading was done at the Calgary end of the proposed line, and later on poles were erected for a considerable distance to carry on the overhead wires, while several car loads of ties were delivered, but were never placed in position. These ties lay on the ground for nearly two years, decreasing in number and deteriorating in quality. The City of Calgary subsequently purchased the remaining ties for its municipal electric railway, and some poles which were subsequently used for street lighting purposes. The city has not entered into any agreement with the company regarding the operation of the line, and is in no way interested in the concern. As far as we can ascertain it was entirely a private proposition, and it may be considered dead, at all events for the present. (May, 1913, pg. 235.)

Edmonton and South Western Ry.—See under "The Edmonton Power Co.'s Electric Railway Project," on another page of this issue.

Edmonton Interurban Ry.—Workmen are reported to be stringing wires on the line from the Edmonton Radial Ry., on 124th St., along Alberta Ave. and 127th St. to the Grand Trunk Pacific Ry. near West Edmonton. Track is reported to have been laid as far as the G.T.P.R. shops, but pending the obtaining of an order from the Board of Railway Commissioners for the crossing, there will be no physical connection of the two sections. It was expected to have the line ready for operation to the G.T.P.R. tracks by Jan. 31. The line will be operated by the Edmonton Radial Ry. (owned by the City of Edmonton) under an arrangement made in Sept., 1915. (See Edmonton Radial Ry., Jan., pg. 30, and Oct., 1915, pg. 404.)

Lake Erie and Northern Ry.—M. N. Todd, General Manager, is reported to have said in an interview, Jan. 11, that it was ex-

pected to begin operating the Galt-Brantford section of the line about Feb. 1, and that as soon as arrangements with the Brantford and Hamilton Ry. were completed, an hourly service would be given. He also said that an announcement would be made shortly respecting the opening for traffic of the Brantford-Port Dover section. (Jan., pg. 28.)

London and Port Stanley Ry.—The property owners of London, Ont., have approved a bylaw to raise \$110,000 to provide a new station, additional sidings, etc. It is proposed to provide for the interest and sinking fund for these debentures out of the earnings of the line. (Jan., pg. 30.)

Moncton Tramways, Electricity and Gas Co.—The Sunny Brae, N.B., Town Council has under consideration the company's proposal to extend its line from Moncton into that town. A special committee reported a recent interview with E. B. Reeser, Vice President of the company, when the question of the crossing of the Intercolonial Ry.'s Union St. bridge and the widening of Town St. were discussed. The General Manager of the Canadian Government Railways had promised the use of the bridge, provided it did not necessitate any expenditure on the part of the railway. The council appears to be opposed to the widening of the street, but the matter will be again taken up with the company. (Jan., pg. 30.)

Montreal and South Western Ry.—The Quebec Legislature is being asked to reenact the Act constituting "the said company incorporation, sanctioned Mar. 24, 1911, statute 1, Geo. V., 2nd session, chap. 82, under reserve, and moreover to give more rights permitting said company to acquire, possess, develop and operate hydro electric power within 125 miles from Montreal, and for other things in connection therewith." (Jan., pg. 30.)

Montreal Tramways Co.—A press report states that construction will be started soon on an extension of the Park Ave. line from Van Horne to Atlantic Ave. (Dec., 1915, pg. 482.)

Morrisburg and Ottawa Electric Ry.—The Ontario Legislature is being asked to extend the time for the building of this projected railway from Morrisburg to Ottawa. G. D. Kelley, Ottawa, solicitor for company. (June, 1915, pg. 227.)

Niagara Falls Park and River Ry.—Alternative plans are reported to have been submitted to the Ontario Railway and Municipal Board for alternative changes on the line near Queenston Heights, Ont., where the serious accident occurred July 7, 1915. Some time ago the Board, it is said, submitted a plan proposing a new down grade single track line which would take one continuous curve, leaving the existing line for up grade traffic. The company's alternative proposal is said to involve a partial reconstruction of the existing double track line, by lengthening the curves and cutting down the gradients. The new plans are under the Board's consideration. (Aug., 1915, pg. 317.)

Oshawa Ry.—We are officially advised that during 1915 the company reconstructed and paved half a mile of main line track in Oshawa, Ont.; and laid 1,024 ft of new sidings. (Nov., 1915, pg. 441.)

St. John Ry.—We are officially advised that the company started operating its cars between East and West St. John, N.B., on Jan. 1. over the new arch bridge, which replaces the old suspension bridge across the St. John River at the reversing falls. (Sept., 1915, pg. 359.)

Schomberg and Aurora Ry.—We are officially advised that this railway, extending from a junction with the Toronto and York Radial Ry.'s Metropolitan Division at Bond Lake to Schomberg, Ont., 14.42 miles, which has hitherto been operated by steam, has been electrified. The electrification plans were described in Canadian Railway and Marine World for July, 1915. It is expected to start the electrical operation about Feb. 1. (Jan., pg. 30.)

Three Rivers Traction Co.—The track built and in operation is 3.9 miles long, consisting of a belt line, 2.9 miles, and an extension to the Wayagamac Pulp and Paper Co.'s plant. The belt line starts at the corner of St. Maurice and St. Cecile Sts., runs southeasterly to Notre Dame St., along that street to St. Antoine St., south on St. Antoine track along Du Fleuve St., north on Du Plator St. (this forms a small loop), thence along Desforges St., westerly on Champlain St., north on St. George St., to the corner of St. Marie St., and thence easterly along St. Marie, Champfleu and St. Maurice Sts. to the starting point. The Wayagamac extension runs from the corner of St. Maurice and St. Cecile Sts. to the St. Maurice River, which is crossed, to St. Christopher Island, and thence southerly to the pulp and paper plant, with a spur line on the mainland to the Shawinigan Power Co.'s plant. The extension to Cap de la Madeleine will start at the point where the Wayagamac extension turns southerly on St. Christopher Island, and will be about two miles long. The Quebec Legislature is being asked to grant the company power to run its cars within the village and parish of Cap de la Madeleine, notwithstanding the opposition of the Council and its refusal to submit a bylaw to the ratepayers, and for such other powers which the putting into operation of the tramway has rendered necessary. (Jan., pg. 28.)

Vercheres, Chambly and La Prairie Tramways Co.—The Quebec Legislature is being asked to incorporate a company with this title, to build an electric railway from Montreal to places south of the St. Lawrence River. The points to be connected, it is reported, are St. Roch and Chateaugay, and La Prairie and Chambly with loop lines and connections branching to various places in the counties of Chateaugay, La Prairie, Chambly, Vercheres and Richelieu. The company is reported to have a provisional organization, and to have plans prepared to secure an entrance into Montreal, the character of which will be made known when the project comes before the Legislature.

Vancouver Car Schedules.—The British Columbia Electric Ry. announced, Jan. 10, a new car schedule for its Vancouver city lines, to come into effect Jan. 15. In announcing the change the management stated that the latest figures available showed that in Nov., 1915, the car mileage was 542,390 miles, against 521,538 for Nov., 1914, while 342,438 fewer passengers were carried than in Nov., 1914. The new schedule will, the circular adds, entail a very heavy additional operating expense to the company, but is in line with the policy which the company intends to adopt and which it trusts will meet with the support of the travelling public. The traffic will be very carefully watched as in the past, and special cars will be run, if necessary, to supplement the ordinary services detailed above.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry., and allied companies.

	Nov. 1915	Nov. 1914	July 1 to Nov. 30, 1915	July 1 to Nov. 30, 1914
--	-----------	-----------	-------------------------	-------------------------

Gross earnings.	\$562,782	\$648,485	\$2,636,479	\$3,324,836
Expenses.	478,643	501,224	2,407,173	2,561,905
Net earnings	84,139	147,261	229,306	762,931

Cape Breton Electric Co.—

	Nov. 1915	Nov. 1914	July 1 to Nov. 30, 1915	July 1 to Nov. 30, 1914
--	-----------	-----------	-------------------------	-------------------------

Gross earnings.	\$33,011.80	\$30,044.39	\$165,448.68	\$152,777.74
Expenses.	17,789.98	17,847.12	88,030.77	91,338.18
Net earnings	15,221.82	12,197.27	76,657.91	61,439.56

London St. Ry.—

	1915	1914	Increase
--	------	------	----------

Gross earnings.	\$398,568.00	\$375,895.28	\$22,662.72
Expenses.	275,212.04	267,900.83	7,311.21
Net earnings	123,645.96	107,994.45	15,651.51

Nova Scotia Tramways and Power Co.—

The Nova Scotia Public Utilities Board has refused the company's application for permission to increase its capital stock from \$6,000,000 to \$10,000,000, as no organization has been effected and therefore no vote of the shareholders authorizing an increase, as required by the charter, can be taken. The increase was desired for the absorption of the Halifax Electric Tramway Co.

Toronto Ry., Toronto and York Radial Ry., and allied companies:

	Nov. 1915	Nov. 1914	Jan. 1 to Nov. 30, 1915	Jan. 1 to Nov. 30, 1914
--	-----------	-----------	-------------------------	-------------------------

Gross earnings.	\$851,113	\$824,634	\$8,793,719	\$9,296,377
Expenses.	397,383	431,109	4,391,382	4,765,099
Net earnings	453,730	393,525	4,402,337	4,531,278

Toronto Ry.—The receipts and the percentages paid to the city, for 1915, compared with those for 1914, were as follows.

	1915	City per-	1914	City per-
--	------	-----------	------	-----------

January	\$471,226	\$70,486	\$501,844	\$75,257
February	440,314	66,047	461,274	72,058
March	488,468	93,141	510,751	102,150
April	467,702	93,540	501,435	100,287
May	468,954	93,791	534,466	106,893
June	450,582	90,116	525,534	105,107
July	449,108	89,822	515,883	103,177
August	447,969	89,594	507,912	101,582
September	439,573	89,166	525,265	102,021
October	461,683	96,935	487,689	99,274
November	472,759	46,301	465,035	46,503
December	501,958	58,715	437,424	59,610

\$5,610,296 \$867,654 6,034,512 \$954,000

Winnipeg Electric Ry.:

	Nov. 1915	Nov. 1914	Jan. 1 to Nov. 30, 1915	Jan. 1 to Nov. 30, 1914
--	-----------	-----------	-------------------------	-------------------------

Gross earnings.	\$323,025	\$330,398	\$3,122,620	\$3,732,901
Expenses.	188,067	206,394	2,036,092	2,185,489
Net earnings	134,958	124,004	1,086,528	1,547,412

During January, \$750,000 of two year 6% gold notes, dated Jan. 15, and due Jan. 15, 1918, were offered for sale in New York at 100 and interest. These are a direct obligation of the company, specifically secured by deposit with the Central Trust Co., New York as trustee, \$970,000 of 4½% perpetual consolidated debenture stock secured by a mortgage on all the company's property, subject to \$5,000,000 of underlying bonds.

Winnipeg press dispatch, Jan. 19:—The Winnipeg Electric Ry. has notified the City Treasurer that its gross earnings for 1915 were \$1,856,867.70, on which 5% or \$92,843.88 will be paid the city.

The company has declared a dividend of 2% for the last quarter of 1915, making a total of 9½% for the year, against a total of 12% in 1914, 1913 and 1912. The dividends in 1911 totalled 11½%, 10% in each of several previous years.

Windsor, Essex & Lake Shore Rapid Ry.—

Reference has been made from time to time to the Dominion Traction & Lighting Co. It was incorporated under the Dominion Companies Act in Jan. 1913, with head office at Toronto, which appears to have been moved to Windsor, Ont., where W. C. Ken-

nedly is President. The company is a holding one and among other securities has \$750,000 first mortgage bonds, W.E. & L.S.

R.R. and also the Windsor Gas Co.'s stock and bonds. The D.T. & L. Co. has issued \$1,825,000 first mortgage 5% bonds.

Mainly About Electric Railway People.

P. Pocock was re-elected Chairman of the London, Ont., City Council's Public Utilities Committee, Jan. 12.

W. B. Baptiste has been appointed Manager, Three Rivers Traction Co., Three Rivers, Que. **J. H. McNeil** is Superintendent.

Geo. Rapsey and **A. E. Wideman** were re-elected Utilities Commissioners by Port Arthur, Ont., ratepayers, Jan. 3.

B. I. Dasent has been appointed Publicity Agent, British Columbia Electric Ry., Vancouver, vice F. Harris, resigned.

Edmund E. Walker has been appointed Sales Manager, Light & Power Department British Columbia Electric Ry., Vancouver.

A. G. Workman has been appointed Chief Dispatcher, British Columbia Electric Ry., New Westminster, succeeding T. G. Connon.

C. Rummel, heretofore Manager, Light & Power Department, British Columbia Electric Ry., Vancouver, has been transferred to the same position at New Westminster.

Aldermen Picard, Bush and Wilson were appointed as a committee on public utilities by Edmonton, Alta., City Council, Jan. 4, Alderman Picard being chairman.

A. C. Eddy has been appointed Engineer, Maintenance of Way, British Columbia Electric Ry., Vancouver, succeeding H. J. Tippet.

Geoffrey Porter, heretofore Assistant Chief Engineer, British Columbia Electric Ry., Vancouver, has been appointed Chief Electrical Engineer.

J. E. Richards, formerly General Freight & Passenger Agent, Chatham, Wallaceburg & Lake Erie Ry., Chatham, Ont., has been appointed Auditor and Treasurer, London & Port Stanley Ry., London, Ont.

H. A. Robson, K.C., ex-Public Utilities Commissioner for Manitoba, gave an address to the Alberta Law Society, at Calgary, Alta., recently on the work of a public utilities commission.

W. D. McGregor, heretofore in the London & Lake Erie Ry. & Transportation Co.'s service, London, Ont., has been appointed Freight and Passenger Agent, London and Port Stanley Ry., St. Thomas, Ont.

G. Gordon Gale, General Manager, Hull Electric Co., Hull, Que., has been elected a member of the managing committee of the Canadian Society of Civil Engineers' Ottawa Branch.

Lieutenant Gordon Duke, attached to the Royal Navy Aviation Corps, who was killed in an aviation accident at Eastbourne, England, Jan. 10, was formerly employed on Toronto Civic Ry.'s staff.

Arthur Reid, who was Commissioner of Public Utilities for Lethbridge, Alta., during 1914, handed over the office to his successor, Mr. Freeman, Jan. 1. It is said that Mr. Reid will remove from Lethbridge, where he has resided since 1905.

Geo. W. Caye, heretofore Assistant to Vice President and General Manager, and Purchasing Agent, Grand Trunk Pacific Ry., has been appointed Purchasing Agent, Montreal and Southern Counties Ry., as well as of the Grand Trunk Ry. vice J. H. Guess, resigned.

Lieut. Lorenzo Evans, who was reported recently as having been seriously wounded in Flanders, is not a son of E. A. Evans, M.Can.Soc.C.E., ex-General Manager, Quebec Railway, Light, Heat & Power Co., as stated

in a number of daily papers, his father being Lorenzo Evans, of Dobell, Beckett & Co., Quebec.

T. F. Ahearn, only son of Thos. Ahearn, President, Ottawa Electric Ry., and who is himself a director of that company and of the Ottawa Car Manufacturing Co., entered the Army Service Corps in Oct., 1914, as a lieutenant, went to England in March, 1915, and went on to France in Sept., 1915. He has been promoted to a captaincy, and has been recalled to militia headquarters, Ottawa, to assist in munitions work.

P. A. Macdonald, barrister-at-law, Winnipeg, has been appointed Public Utilities Commissioner for Manitoba, in succession to H. A. Robson, who resigned recently to become Chief Counsel for the Union Bank. Mr. Macdonald was born at Gananoque, Ont., Jan. 6, 1857, educated at Kingston Grammar School and Queen's University, from which he graduated 1876, and proceeded to the study of law at Toronto, being called to the bar at Osgoode Hall, Jan., 1880. He entered into practice at Winnipeg in partnership with the late J. M. Macdonell in 1882, as Macdonell and Macdonald; subsequently practising in the firm of Macdonald and Brophy, and later as Macdonald and Cameron. In 1888 he was appointed Master in Chancery, referee and accountant, and he has had considerable experience in local arbitrations, among the matters in which he acted being one in connection with the threatened strike of C.P.R. employees in 1910, when he was chairman of the conciliation board. He resigned his public position in 1911, and returned to private practice. In Sept., 1915, he was appointed police magistrate to hear the charges against Sir Rodmond Roblin and other ex-members of the Manitoba Government.

Attempt to Secure Free Transportation of Soldiers on Toronto Railway.

The Toronto Board of Control, at a meeting, Jan. 21, decided, on the Mayor's motion, to apply to the Legislature for legislation providing that in cities having a population of 200,000 or more, electric railway companies shall carry soldiers and nurses, including soldiers in training, free of charge, notwithstanding any law, statute, custom or usage to the contrary, and providing a penalty of \$100 for failure to give a service and for each breach of the Act. The Mayor stated that soldiers are carried free on the cars operated by the municipality, and are carried free in Great Britain, Australia, and other countries.

Toronto is the only city in Ontario which would come under this proposal, and in newspaper interviews, R. J. Fleming, General Manager, Toronto Ry., is reported to have characterized the suggestion as a gross impertinence, and added that the company had done much for the soldiers, a good deal of which was not made public. The company had supplied free cars on several occasions. He continued that until the city saw fit to provide the soldiers with almost everything they needed free of cost, the company should not be asked to provide free transportation, and the proposed legislation to force the company to give free transportation to soldiers will be fought strenuously.

February, 1916.]

Electric Railway Notes.

The Quebec Public Utilities Commission is investigating two recent accidents on the Montreal Tramways Co.'s lines.

On account of the extension of the St. John Ry. service across the river bridge at St. John, N.B., the issue of transfers by way of the ferry steamboat has been discontinued.

The Board of Railway Commissioners has approved Montreal and Southern Counties Ry. freight mileage tariff C.R.C. 5 cancelling C.R.C. 1, effective Jan. 1, 1916, and rescinding order 21566, April 1, 1914.

The North Shore Power Co. is applying to the Quebec Legislature for authority to extend its operations beyond the limits of the district of Three Rivers, and more especially in the counties of Portneuf and Lotbiniere.

The Twin City Rapid Transit Co. is conducting a campaign for a new street railway franchise in Minneapolis, Minn. The company secured its charter in 1875 for 50 years. Its franchise for St. Paul is perpetual, and has been so decided by the court and accepted by the city.

The British Columbia Electric Ry. has maintained since 1913 a technical school in Vancouver for the benefit of its employees. At the annual gathering of the pupils, Dec. 30, addresses were delivered by G. Kidd, General Manager; R. M. Freer, President of the School, and J. G. Lister, technical instructor.

A Board of Railway Commissioners' traffic inspector visited New Westminster, Jan. 10, investigating the service given by the British Columbia Electric Ry., as a result of complaints made by residents along the Burnaby Lake line. The inspector heard statements from all parties concerned and will report to the Board.

The Lethbridge Municipal Ry. has on hand \$8,500 of tickets in books of 30, and under the resolution of Dec. 20, 1910, it sells 8 tickets for 25c. In order to use up the old tickets, the Commissioners passed a resolution, Dec. 30, 1915, to sell these tickets at 30 for \$1. The new rate is 3 1-3 cents, against the old one of 3 1/2 cents a ride, an increase of 5-24 of a cent.

The Brantford, Ont., Tp. Council passed a resolution, Jan. 11, to the effect that while the council is willing to encourage the municipal ownership of public utilities its solicitor be instructed to oppose the application of the Brantford City Council as to the Grand Valley Ry., unless the charter imposes upon the railway the same obligation to pay taxes as if it were privately owned.

In connection with a recent threatened strike of electrical workers in Vancouver, B.C., the British Columbia Electric Ry., it is alleged, declared a lockout. The electrical workers instituted criminal proceedings against the company for causing an illegal lockout, but owing to some technicality Judge McInnes dismissed the case, Jan. 7.

Following the reception, by the Ontario Railway and Municipal Board, of a deputation of citizens respecting additional car service, R. J. Fleming, General Manager, Toronto Ry., stated to the Board, on Jan. 5, that the company would be prepared, provided the city would build the necessary loop line, at Keele and Dundas Sts., to operate its cars over it at a price per car mile to be fixed by the Board, and to operate over the Toronto Civic Ry. line west of Dundas St., on Bloor St., at 20c. per car mile.

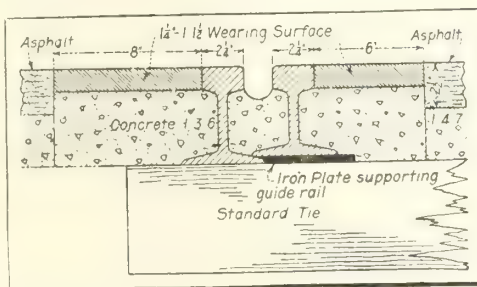
Sir Adam Beck, Chairman, Hydro Electric Power Commission of Ontario, stated that

the passing of the hydro radial railway by-law in Toronto, has opened the way for the purchase of the Toronto and York Radial Ry.'s Metropolitan Division, and that negotiations will be commenced forthwith. The City of Toronto has made a request that the Commission undertake the negotiations on its behalf.

Cost of Concrete Header Along Rails.

By H. R. Ferris, Victoria, B.C.

The accompanying sketch shows concrete header laid along the rails of a car line in asphalt pavement in a fairly light traffic residential street. The track is all on curve as it follows the inside of a circular "place" where four streets come together. The headers have been down nearly two years and are still in good condition, although several lateral cracks have occurred between expansion joints. This is possibly due to the jarring of cars passing around the Circle, as, where similar headers have been laid on straight tracks, no difficulty has arisen. It has been suggested by the engineers of the street railway company that this defect could be avoided by the use of reinforcement laid longitudinally with the rails. The



Cross Section of Concrete Header Along Street Car Tracks.

concrete was machine mixed; it would probably have been cheaper to lay by hand. The cost of constructing 2,200 lin. ft. of header was as follows:

	Cost per 100 lin. ft.
Labor:	
Foreman, 33 hrs. at 55 cts.	\$0.825
Mixer eng., 9 hrs. at 45 cts.	0.184
Mixer helper, 14 hrs. at 35 cts.	0.222
Cement man, 4 hrs. at 30 cts.	0.055
Common labor, 170 hrs. at 30 cts.	2.318
Form setter, 11 hrs. at 50 cts.	0.250
Form setter and helper, 30 hrs. at 40 cts.	0.545
Form setter and helper, 10 hrs. at 35 cts.	0.159
Finisher, 40 hrs. at 60 cts.	1.091
Finisher helper, 30 hrs. at 40 cts.	0.545
Finisher helper, 2 hrs. at 30 cts.	0.027
Labor mixing surface, 40 hrs. at 30 cts.	0.545
Total labor	\$3.766
Cartage on tools, etc. (\$2)	0.091
Materials delivered:	
Cement, 51.25 bbls. at \$2.60	\$6.057
Sand, 13.6 cu. yds. at \$1.70	1.050
Gravel, 28 cu. yds. at \$1.60	2.036
Lumber for forms	0.273
Total materials	\$9.416
Grand total	\$13.273

The Toronto Ry. and the Outside Running Board on Summer Cars.—The Ontario Railway and Municipal Board has ordered the Toronto Ry. to have 25 cars in service by March 1, with longitudinal seats and the windows so arranged that sufficient ventilation shall be obtained during the summer months. A considerable time has been taken up in experimenting with various types of car with the view of eliminating the outside running board. Cars have been equipped with a longitudinal seat on the one side and cross seats on the other, and also with the cross seats half on one side and half on the other, but neither design has been acceptable. The present order merely permits of the ordinary cars being used, with open windows.

Electric Railway Track Laid in 1915.

Revised figures of new track laid by electric railways in Canada during 1915, show that 86.35 miles were laid by 14 lines. Of these, the London and Port Stanley Ry. was converted from a steam railway, the line being entirely reconstructed.

The Lake Erie and Northern Ry. track laid in 1914 was included in the table for steam railways for that year, as it had not been definitely announced that it would be operated by electricity. The total length of this line from Brantford to Port Dover, Ont., is 503 miles. Track was laid in 1914, from Brantford to Galt, 21.1 miles, and from Waterford to Simcoe, 6.8 miles, a total of 27.9 miles. The final reports sent in by the company for 1914, and published in our revised table in Feb., 1915, show 30 miles of track as having been laid, viz.: Brantford to Galt, 22.00 miles; Waterford towards Simcoe, 8.00 miles, or 2.1 miles more than the actual mileage between the four points named.

The Sudbury and Copper Cliff Suburban Electric Ry. began track-laying in 1914, laying 0.43 of a mile within the limits of the town of Sudbury, Ont.; it completed the line to Copper Cliff in 1915, making a line having a total present length of 6.09 miles.

Brandon Municipal Ry.:	
Three extensions	1.27
Brantford Municipal Ry.:	
Extensions in city	1.25
Lake Erie and Northern Ry.:	
Brantford to Waterford	15.70
Simcoe to Port Dover	6.70
	22.40
London and Port Stanley Ry.:	
London to Port Stanley	23.60
Montreal and Southern Counties Ry.:	
St. Cesaire to Granby, Que.	15.67
Montreal Tramways Co.:	
Four extensions	1.18
Peterborough Radial Ry.:	
Park St. to Monaghan Road	0.38
Sandwich, Windsor and Amherstburg Ry.:	
Windsor city limits to Sandwich	0.50
Sudbury & Copper Cliff Suburban E. Ry.:	
Limits of Sudbury to Copper Cliff ..	4.35
Ramsay Lake line	1.12
Frood Mine section	0.19
	5.66
Three Rivers Traction Co.:	
Extension to Wayagamac Pulp and Paper Co.'s plant	1.0
City belt line	2.9
	3.90
Toronto Ry.:	
Ossington Ave. (feet)	4,161.52
Hallam St.	5,149.27
Dufferin St.	178.05
Lappin Ave.	3,907.84
Curved track in connection with these lines	998.43
	Feet 14,385.11— 2.72
Toronto Civic Ry.:	
On Bloor St.	0.75
Toronto Suburban Ry.:	
From Lambton, mileage 1.82, to Mimico Creek, mileage 3.61	1.79
From the Speed River, mileage 45.11, to Guelph, mileage 48.29 ..	3.18
	4.97
Winnipeg Electric Ry.:	
Extensions in city	2.10
Total	86.35

Saskatoon Municipal Ry. Results, Etc.—E. S. Martin, Commissioner, in estimating the financial requirements of the City of Saskatoon, Sask., for 1916, in his report, dated Dec. 30, said: "During December the street railway, for the first time since its inception, will, it is anticipated, show a profit of approximately \$800." The estimated deficit for 1915 was \$32,500, while that for 1916 is \$20,000. He also referred to the necessity for additional capital expenditure for an extension of the power house, and the installation of additional plant.

The Hydro Electric Power Commission of Ontario's Proposed Electric Railway From Toronto to London.

Canadian Railway and Marine World for January gave details of the electric railway which the Hydro Electric Power Commission of Ontario proposes to build to form a trunk line from which to radiate other lines serving country districts at present without transportation facilities. The various municipalities through which the line is to pass are to be responsible for the financial success of the undertaking, and are to be assessed pro rata for the whole cost and any deficiency that may occur, while the Commission will do the actual construction and financing, and conduct the operation of the line when completed and equipped. The details are put into the form of an agreement with the Commission, which is to be executed by the municipalities, and on Jan. 1, the majority of the municipalities submitted a bylaw to the vote of qualified rate-payers, empowering the local councils to enter into the agreement with the Commission.

Of the 31 municipalities concerned, 24 voted on Jan. 1, and of these, 20 returned majorities authorizing the councils to enter into the agreement, a copy of which was incorporated in the bylaw, and four municipalities rejected it. The total votes registered in favor of the bylaw in the municipalities which voted were 31,509, and the total voting against were 11,097. The municipalities which did not vote on Jan. 1, but which have decided to take a vote during February, are, the townships of Toronto, Eramosa and Nelson, while the townships of South Easthope, Puslinch and Ellice decided by votes of their councils against putting the bylaw to the vote, and in the township of Etobicoke, an injunction was obtained against a vote being taken, on a technicality. In the four places where the bylaw was defeated, arrangements are being made for its resubmission, and in these places, as well as in others where a vote has not yet been taken, meetings are being held, at which the details are being more fully explained.

In the townships affected by this vote, and which are also likely to be served in part by the Toronto Suburban Ry. extension from Lambton to Guelph, the attitude of the Commission towards this road is of some interest. It is reported that the Commission has made an offer to the company, to take over the entire extension as constructed, at cost plus 10%, but no confirmation of this is forthcoming. The route of the proposed new line as laid out by the Commission, parallels the Toronto and York Radial Ry.'s line from Sunnyside, Toronto, to Port Credit, and it is surmised that it is the Commission's intention to acquire this line on behalf of the municipalities.

Following are the figures of the voting in 23 municipalities on Jan. 1, showing those for and against, with the majority in either case. Where the majority was against the by-law an asterisk is shown:—

	For	Against	Majority
City of Toronto	21,247	5,711	15,536
London	2,763	2,087	676
Stratford	1,693	420	1,273
Berlin	1,078	413	665
Guelph	932	306	626
Town of St. Marys	400	288	112
Waterloo	344	135	209
Milton	138	2	136
Township of Wilmot	383	160	223
Waterloo	322	425	*103
London	287	118	169
Biddulph	281	121	160
Downie	211	168	43
Guelph	179	160	19
Trafalgar	174	25	149
Blanshard	102	158	*56

Township of N. Easthope ..	96	224	*128
East Zorra	0	12	*12
Esquesing	34	7	27
Nassagaweya	129	46	83
Village of Mimico	318	45	273
New Hamburg	158	35	123
Port Credit	123	15	108
New Toronto	117	16	101

Sir Adam Beck, Chairman of the Hydro Electric Power Commission of Ontario, is reported to have said in recent interviews:

"The only places that have voted adversely are those not contiguous to the line, and under a clause in the act their consent is not necessary for the construction of the radials. They are not touched by the radials, and, of course, our work will not be delayed. However, we can go back there and institute another campaign, and have another vote taken, and this is probably what we will do. The first thing we shall do will be to finally decide upon the routing of the line, especially through the larger cities. We shall also complete our plans and specifications. Our first expenditure will be for the right of way. The acquisition will be gradual. Property is cheaper now than it will ever be again, and it behooves us to secure the necessary land while it is cheap. Copper, steel, and aluminum are dear at present, but by the time we need them they will be cheaper. The close of the war will send these commodities down. We hope to secure sufficient funds to begin preliminary work at an early date, and as the money markets improve we will proceed more rapidly, aiming toward completion at the earliest possible time, as the need for suburban radial railways steadily grows greater. Our progress in this connection will, however, be guided absolutely by considerations of our paramount and dominant duty in the great struggle for righteousness, freedom and justice being waged in Europe. We shall be prepared to give work to many men just at a time when work will be needed. At the close of the war there will likely be many men out of work, and we will be able to provide for large numbers of these. We shall proceed cautiously, as finances will permit."

In view of the increased demand for power which the radial railways will create, the Commission, which is now using about 120,000 horse power, proposes to construct a power plant at Niagara Falls to develop 600,000 h.p.

Postmen's Transportation in Peterborough.

—Following the example of the Sherbrooke Ry. and Power Co., which refused to enter into another agreement to carry postmen for \$25 a man per year, the Peterborough Radial Ry. also refused, but offered to do so for \$35, which the Post Office Department declined to pay. The Peterborough Co. had its conductors keep a record of the postmen's rides and found that for the week of Nov. 23 to 29, 1915, the 17 postmen made 829 trips, an average of 8 trips per man per day, so that the company was getting a fraction less than 1c. for each ride. The Department has authorized the postmaster to buy car tickets for the postmen and in view of the result of its count of the number of rides taken it is doubtful if the Peterborough Company would now accept \$35 a man per year.

The Port Arthur, Ont., Utilities Commissioners decided, Dec. 29, to again start operating the south belt line for the convenience of residents of Mariday Park and vicinity.

Brantford Sells Part of Grand Valley Ry.

Brantford, Ont., property owners approved, on Jan. 3, by a majority of 396, a bylaw to sell the Paris-Galt section of the Grand Valley Ry. to the Lake Erie and Northern Ry. for \$30,000. The right of way of the Blue Lake siding is granted to the L.E. and N. Ry., but the ties, rails, poles, wire and other material are reserved to the Brantford Municipal Railway Commission. The L.E. and N.R. agrees to operate its entire line from Galt to Port Dover by electricity only; and agrees not to operate within the Flats district of Paris except for freight only, and upon such further conditions as shall be approved by the Brantford City Council. The agreement is to be ratified by the shareholders of the L.E. and N.R., and approved by the Board of Railway Commissioners and the Dominion Parliament.

A Brantford press dispatch of Jan. 24 says that the third reading of the bylaw was laid over by the city council for two weeks, some aldermen taking the ground that it should have been submitted to all voters and not to the property owners alone, and that the proposed sale price of \$30,000 is insufficient.

Tango Tickets Discontinued.—The British Columbia Electric Ry. gave notice, Dec. 27, that the 8 for 25c., no transfer tickets, known as "tango tickets," which were put on sale in May last, were to be discontinued Jan. 1. The notice stated that although there had been a larger number of passengers carried since the tango tickets were put on sale, yet the increase was not sufficient to meet the cost of operation; the no transfer feature of the tickets was also unpopular. The old rate of 6 for 25c., with transfer, was put in force Jan. 1. These tickets are available in Vancouver and Victoria day and night.

Jitney Accidents in Portland.—The Spectator, of Portland, Ore., says that during 9 months, 82 persons were injured in jitney accidents in that city. Since Feb. 13, 1915, the jitneys were responsible for 441 accidents to property; there were 51 collisions in which city property was injured; 14 collisions between jitneys; 38 collisions with private automobiles and 338 collisions with street cars. The statement is made that "nearly every one of these accidents was preventable and almost all were due to violation of ordinances that all our vehicles, apparently with the exception of the jitney, must observe."

Victoria Harbor Works.—During 1915, the channel leading to the inner harbor at Victoria, B.C., was widened, and the greater portion of the upper basin was dredged to 20 ft. In the lower basin there is a depth of 20 ft. at low water. Various rocks at the entrance have either been removed or cut back, straightening out a difficult turn in addition to widening. The northern end of the channel is being straightened gradually and rocks are being removed. The construction of a turning basin having about 21,000 superficial feet area was also completed during the year. This has a depth of 30 ft. at low water. About two-thirds of the total length of the breakwater is above high water, and nine of the large caissons for the two piers have been placed in position. The total outlay to the end of the year, on the breakwater, was \$1,400,000, and on the piers, \$740,000.

Load Line on Steamships.—A press report states that the Dominion Government has under consideration the establishment of a load line regulation for ocean going vessels, similar to that in effect in Great Britain and other maritime countries.

Marine Department

Shipping Letters From the Head of the Great Lakes.

The New York State Barge Canal's Progress and Prospects.

F. & W. Jones, shipping brokers, Fort William, Ont., wrote, Dec. 31, as follows:

The coal movement at the Canadian head of the lakes during the season of 1915 has only been of moderate volume. It had been expected that a much more substantial movement would have developed, but those expectations did not eventuate, partly on account of the financial depression which ruled at the commencement of the season and partly on account of a revival of activity in the Canadian western coal fields. The total amount of the season's coal arrivals by lake aggregated approximately 1,565,000 tons, distributed at the various docks as follows: Canadian Northern 650,000 tons; Canadian Pacific, 675,000 tons; Grand Trunk Pacific, 175,000 tons; Murphy's, 65,000 tons. The greatest volume on record of coal at these ports was in the season of 1913 when a total of 3,828,500 tons was brought in. In 1914 arrivals dropped to a little more than 1,000,000 tons. The past season has, therefore, made a fair advance in volume, but it is not considered that the amount of receipts is at all adequate to the prospective demand. This tonnage was carried in 224 vessels of which 115 were U. S. register carrying 849,000 tons, and 109 Canadian carrying 715,200 tons.

It is somewhat difficult to secure actual figures representing the stocks of coal now on pile, owing to the only available records being in the hands of private companies. We have, however, made a careful estimate from what data has been available and have arrived at the following stocks, which we believe will be found to be as near accurate as possible: Canadian Northern, 590,000 tons, 16% commercial; Canadian Pacific, 550,000 tons, 60% commercial; Grand Trunk Pacific, 230,000 tons, 15% commercial; Murphy's, 30,000 tons, 100% commercial. Westbound rail movement was very active during the late autumn and every indication is that very heavy demand will be made on stocks right through the winter months, and it is anticipated that by the opening of navigation the coal piles will be very nearly depleted, as a matter of fact, one railway has already been drawing on its service coal stocks east of Port Arthur.

Grain.—The close of navigation at the Canadian head of the lakes was unprecedented in the volume of grain moved. From Dec. 1 to the close, 34,886,308 bush. were shipped east, in 139 vessels, of which 51 were Canadian register and 88 U. S. There are 18 vessels tied up for winter storage, 13 Canadian and 5 U. S. At time of writing 16 of these are loaded with a total tonnage of approximately 2,500,000 bush. Two U. S. bottoms are still unchartered, with a capacity of about 750,000 bush.; these will probably be loaded before final ice conditions set in. Although the official closing was slated for Dec. 12, four of the above vessels cleared after that date, the last one leaving for Duluth Dec. 18.

From Sept. 1, the date at which new crop records begin, there was received at the terminal elevators 179,055,251 bush. of all grains. At that date there was also in store of old crop about 1,566,927 bush., making a total of grain stored of 180,622,184 bush. During the same period there has been shipped out 1,099,844 bush. At the close of navigation stocks on hand were reduced to about 10,000,000 bush., since then to time of writing, grain has been arriving at

the rate of approximately 1,000,000 bush. per working day. Stocks in store have consequently climbed up considerably, and now stand, after allowing for all rail shipments, at 22,500,000 bush. It is estimated that several thousand cars are on track west of Fort William and Port Arthur probably 4,000 on the Grand Trunk Pacific, and a similar number on the Canadian Northern and Canadian Pacific, for which storage must be found. It will thus be seen that but a short time can elapse before elevators will be filled to capacity.

The total quantity of grain moved by lake during the whole navigation season of 1915 was 201,639,325 bush., carried in 1,139 vessels, of which 687 were of Canadian register and 452 U. S. Of this 106,543,046 bush. were carried in U. S. vessels or 52% of the whole movement.

Shipment of grain eastbound, all rail, commenced somewhat ahead of time and at the close of navigation shippers had placed orders for upwards of 5,000 cars, and additional orders have been steadily piling up. All rails have moved at an average rate of some 250 cars a day and, to date of writing, this would account for about 4,000,000 bush. This can easily be seen is quite an insignificant amount, in face of the large accumulating of stocks in store. While everything possible is being done to facilitate eastbound movement, it is very questionable whether more than 300 cars a day can be loaded and shipped, in fact it is doubtful whether anything in excess of that figure could be handled at the various eastern points considering the congestion which already exists there.

Taking the previous total crop figures of 742,163,155 bush. of all grains as final, which is now universally conceded; and after allowing the lake shipments of 170,996,844 bush., it will be seen there is still a volume of 571,166,311 bush. to be accounted for. Of this it is estimated there will be retained in the west for domestic purposes 190,000,000 bush., thus leaving some 380,000,000 bush. to be handled after the close of navigation for eastern movement. At present prospects, all rail shipments will not take care of more than 30,000,000 bush., which means that at the opening of 1916 navigation, not only will terminal and line elevators be loaded to capacity, but all available cars will be en route with grain, and then leave a substantial balance in the farmers' hands to come forward.

Estimates of preparation for next season's crop are already being compiled, and while every indication is of great activity, still it is very evident that a repetition of this season's bumper crop can scarcely be expected. There is no doubt that a very great factor in final crop results rests in the amount of acreage of fall ploughing. The coming season will fall short of that of the past one to the extent of probably 25%; against, this, however, must be mentioned that new ground broken up for cultivation will be in the neighborhood of 25% increase, whilst the amount of summer fallow will remain about the same. All things considered, therefore, the coming season will open up with good prospects, as regards activity and preparedness.

The Keystone Transportation Co. of Canada, Ltd., Montreal, has increased its authorized capital from \$500,000 to \$750,000.

The eastern half of the Erie Canal and the Champlain Canal have each a single unfinished and unawarded contract which has been the chief obstacle to the entire completion of its respective section. By letting these contracts together with one or two bridge contracts, and by pushing work on them and on the few other contracts which are under award but not quite completed, it is expected that one season's time will be all that is needed to finish the Champlain Canal and also a channel from the Hudson to Lake Ontario by way of the Erie and Oswego branches. The Erie Canal west of the Oswego junction contains several uncompleted portions. Here legal complications are largely responsible for the unfinished condition. There are numerous railway crossings which have proved to be very troublesome from the standpoint of the state, both because of delays in coming to agreements with the railway companies and on account of the slowness in performing the work in such manner as not to interrupt traffic. Because of the amount of work still to be done and the number of crossings still to be made, it is anticipated that two seasons will be required to complete the western half of the Erie Canal. The State Engineer intends to do his utmost to have all uncompleted work under contract at the earliest possible moment, so that the state may no longer than necessary be denied the benefits of the completed waterway, and meantime may utilize its finished parts. Thus he will justify his prediction that the Champlain Canal can be completed in one year, as can also the canal between Waterford and Oswego and the branch into Cayuga and Seneca lakes, and that the balance of the canal through to Buffalo can be finished in two years. To do this, however, it will be necessary for the legislature at the beginning of its session and as one of its first acts to make provision for the immediate issuing of the \$27,000,000 of bonds authorized by the vote of the people at the last election.

Proposed Provincial Aid for British Columbia Shipbuilding.

At a recent joint session of the Vancouver and Vancouver Island Boards of Trade, the question of shipbuilding in the province was discussed, and a resolution was passed recommending to the B. C. Government that it should aid construction and ownership by contributing a cash bonus, the amount of which might remain to be agreed upon, and which should form a first charge against the vessels and be non-collectible for 20 years, unless the vessels were removed from British Columbia service. It was also recommended that the Government subsidize all freight originating in the province and handled out of B. C. ports, and half of such subsidy amount on other Canadian shipments, applicable to all vessels owned and built under the arrangement outlined, and all such vessels to be considered under the Government control as regards freight rates and routes. Other suggestions were made with a view to assisting in the development of the shipbuilding trade in the province, and a letter was read from the Premier suggesting that a deputation be appointed to meet the sub-committee or shipping appointed by the Government recently, to discuss the matter.

The Batiscan-Bengore Head Case and the Dominion Wreck Commissioner.

At a meeting of the executive council of the Mercantile Marine Service Association at Liverpool, Eng., recently, amongst other things discussed was that relating to the request for the intervention of the Imperial Government regarding the sentence passed by the Dominion Wreck Commissioner, on Capt. Green of the s.s. Batiscan, for responsibility for the collision with the s.s. Bengore Head in the St. Lawrence on Aug. 1, 1915, by which his certificate was suspended for two years, and provision made for the granting of a first mate's certificate for the second year. The Journal of Commerce, Liverpool, in dealing with the meeting, says "The meeting was much concerned to learn that the Board of Trade has intimated their inability to interfere in the case of the collision between the Bengore Head and the Batiscan, whereby the master's certificate of the latter steamer had been suspended for no less than two years, a savage sentence, which has aroused no little indignation throughout the profession. The council were naturally dissatisfied at the Board of Trade's reply and determined to continue their efforts to secure redress to a finding which was not concurred in, even by one of the assessors. The well known severity of the Canadian courts has on several occasions in the past been the cause of considerable agitation, and it is felt that no efforts should be spared to bring their judgments more in accord with those of similar courts in the United Kingdom."

The review of the evidence tendered in the case mentioned, with the court's judgment, were given in full in Canadian Railway and Marine World, for Oct. 1915, and were delivered by Capt. L. A. Demers, Dominion Wreck Commissioner. The judgment was assented to by Capt. F. Nash, one of the nautical assessors, the other, Capt. J. A. Murray, dissenting. He concurred on the main points, but dissented on the sentences passed, and so far as Capt. Green's sentence is concerned, suggested that he be granted a mate's certificate for the full period of the suspension of his master's certificate. By this it will be seen that the Commissioner and the two assessors are agreed on the main findings, and in Capt. Green's case, which is the only one which the paper in question comments upon they differ regarding the granting of a mate's certificate for the first half of the suspension period. The Imperial Board of Trade has carefully reviewed the case, and expresses its inability to interfere, and in addition to this, the Dominion Admiralty Court has held that the Batiscan was solely to blame for the collision. It would therefore appear that the court's decision was correct, and that the sentence passed is, in view of the evidence adduced at the formal investigation, justifiable.

This is not the first time that the Journal of Commerce has developed hysteria about decisions of the Wreck Commissioner's court, and one cannot help but come to the conclusion that it is biased against marine decisions in Canada, as it has previously shown itself to be, without proper reason, against the St. Lawrence route. In the course of its remarks, previously quoted, it refers to "a finding which was not concurred in, even by one of the assessors." If this quoted portion means what it says, it is incorrect, as one of the assessors did concur in the Commissioner's decision. Probably what it intends to convey is that one of the assessors dissented, but in the excitement of the moment, a comma was placed wrongly.

Navigation Aids Throughout Winter.

Recent press reports stated that the Marine Department had arranged for the future continuous maintenance of navigation lights on the Great Lakes, throughout the winter. This is somewhat misleading, and has to some extent been misunderstood. The facts are that the Marine Department has hitherto, towards the close of navigation, removed the light keepers from Michipicoten Island, Michipicoten Island east end, Michipicoten harbor, Otter Island Gargantua, Corbeil Point and Ile Parisienne, and thereafter the lights have been discontinued. In addition to the difficulty experienced in removing the keepers from these stations after severe winter weather sets in, it has become apparent that those engaged in navigation up to the last moment on Lake Superior are considerably inconvenienced by the discontinuance of the lights and fog alarms at these points. While the Department has recognized that it is somewhat unpleasant for the keepers to remain at their posts throughout the winter, the conclusion has been reached that the shipping interests have become so important as to require a change of policy. Arrangements are therefore being made with the various keepers by which it is pro-

posed that they shall remain at their stations throughout the winter hereafter, so that the lights and fog alarms can be kept in operation as long as there is any necessity for doing so.

Toronto Harbor Improvements.

The work to be undertaken during 1916 will consist chiefly of reclamation of land, and the construction of seawall foundations. Most of this work will be undertaken in the western section, and will cover land reclamation along the Lake Shore Road toward Exhibition Park, where grading for the proposed boulevard is to be commenced. During 1915 about 3,800 ft. of foundation for the outside seawall was laid, and during this year it is proposed to lay the concrete superstructure thereon. A further 4,800 ft. of foundation will also be laid, extending easterly from the point where work stopped for the winter. On the eastern section, practically the only work to be carried out will be the construction of a lift bridge over the Don River. Apart from this the only work to be undertaken on the east side will be the overhauling of certain work done by subcontractors, and of which complaints had been dealt with by the Dominion Government.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during 1915.

ARTICLES			CANADIAN CANAL	U. S. CANAL	TOTAL
Copper.....	Eastbound	Short tons	20,381	136,105	156,486
Grain.....	"	Bushels	24,922,096	39,833,151	64,755,247
Building stone.....	"	Short tons			
Flour.....	"	Barrels	2,720,828	5,716,009	8,436,837
Iron ore.....	"	Short tons	4,050,350	41,161,754	45,212,104
Pig iron.....	"	"	6,770	10,830	17,600
Lumber.....	"	M. ft. b.m.	45,916	410,535	456,451
Wheat.....	"	Bushels	63,428,417	192,053,141	255,481,558
General merchandise.....	"	Short tons	117,333	214,881	332,164
Passengers.....	"	Number	13,100	12,837	25,937
Coal, hard.....	Westbound	Short tons	58,133	1,972,597	2,030,730
Coal, soft.....	"	"	416,248	10,910,080	11,326,328
Flour.....	"	Barrels		100	100
Grain.....	"	Bushels	373	31,250	31,623
Manufactured iron.....	"	Short tons	22,570	171,411	194,181
Iron ore.....	"	"		1,500	1,500
Salt.....	"	Barrels	46,081	653,256	699,337
General merchandise.....	"	Short tons	302,388	960,846	1,263,234
Passengers.....	"	Number	11,858	12,541	24,399
Summary.					
Vessel passages.....	Number		4,323	16,910	21,233
Registered tonnage.....	Net		8,480,300	47,918,847	56,399,147
Freight—Eastbound.....	Short tons		6,935,083	49,434,159	56,369,242
—Westbound.....	"		806,228	14,114,834	14,921,062
Total freight.....	"		7,741,311	63,548,993	71,290,304

COMPARATIVE STATEMENT FOR THE SEASONS 1914 and 1915.

Items		Season 1914	Season 1915
Vessels : Steamers.....	Number	14,094	17,699
Sailing.....	"	1,682	1,884
Unregistered.....	"	2,041	1,650
Total.....	"	18,717	21,233
Lockages.....	"	13,502	13,808
Tonnage : Registered.....	Net	41,986,339	56,399,147
Freight.....	Short	55,369,934	71,290,304
Passengers.....	Numbers	59,801	50,396
Coal : Hard.....	Short tons	2,240,505	2,080,730
Soft.....	"	12,246,716	11,326,328
Flour.....	Barrels	9,715,086	8,436,837
Wheat.....	Bushels	150,284,195	255,481,558
Grain.....	"	68,338,072	64,755,247
Manufactured and pig iron.....	Short tons	239,638	211,781
Salt.....	Barrels	777,208	699,337
Copper.....	Short tons	91,764	156,436
Iron Ore.....	"	31,413,765	45,212,104
Lumber.....	m. ft. bm.	452,148	456,451
Building Stone.....	Short tons		
General Merchandise.....	"	1,317,304	1,598,398

The Canadian canal was opened April 13 and closed Dec. 16, 1915; season, 248 days.
The U.S. canal was opened April 17 and closed Dec. 20, 1915; season, 248 days.

February, 1916.]

Longshoremen's Dispute at St. John, N.B.

The dispute between the vessel owners and the longshoremen at St. John, N.B., has been referred to a conciliation board under the Industrial Disputes Act. The vessel owners will be represented on the board by J. Herbert Lauer, General Manager, Marconi Wireless Telegraph Co. of Canada, Montreal, and the longshoremen by J. E. Tighe, of St. John. W. E. Foster, President and General Manager, St. Martin's Ry., St. John, has been appointed chairman by mutual consent. He was also chairman of the conciliation board which sat at St. John in 1913, under the award of which the longshoremen's work has since been carried on and against the terms of which the men are applying, although the scale of pay then granted is higher than at either Halifax or Montreal. Mr. Lauer was, in 1907, a member of the Quebec board of conciliation to represent the employees of the province in labor disputes. In 1910 he was a member of a board of conciliation under the Lemieux Act representing the the Shipping Federation of Canada in a dispute between ship owners and carpenters, and although his report was a minority one it was accepted and acted upon by the employers and employees. In 1910 he was also appointed representative of the Shipping Federation for five years on the permanent board of arbitration to consider grievances which might arise between the vessel owners and the shipping companies.

A St. John press dispatch of Jan. 24 gives particulars of the board's unanimous decision. It says that no change is made in the working schedule of 10 hours day or night in the winter, and 9 in the summer. The demand for 40c. an hour in the winter was refused, the present scale of 35c. an hour in the winter for week days being retained. Extra money is allowed for bulk grain handling on week days, Sundays or holidays. The request for the raising of a number in a gang from 15 to 16 was declined. The board recommends that the shipping companies enter into an agreement with the St. John Longshoremen's Association, to appoint a permanent local arbitration board to deal with disputes, introduce various protective devices to safeguard workmen loading or unloading ships, and better the accommodation of the longshoremen. It is proposed that the agreement should run to Dec., 1919.

The Great Northern Pacific Steamship Co. has been permitted to continue its business, after an investigation into its railway connections, on the ground that the service is in the interest of the public and of advantage to the convenience and commerce of the people, and that a continuance of it will neither exclude, prevent nor reduce competition on the water route. All rates are to be filed with the Interstate Commerce Commission. The company is owned by the Spokane, Portland and Seattle Ry., which is owned by the Great Northern Ry. and the Northern Pacific Ry.

The Farrar Transportation Co., Ltd., held its annual meeting in Toronto, Jan. 25. It paid off about \$16,500 of its bonded indebtedness, this payment being equivalent to about 7% on capital stock, and also paid 25% dividend to its shareholders, and carried a considerable balance to profit and loss account. The officers this year are:—T. I. Thomson, Owen Sound, President; W. E. Allen, Toronto, Vice President; and G. E. Fair, Toronto, Managing Director.

Marine Associations' Annual Meetings.—The Dominion Marine Association's annual meeting will be held in Toronto on Feb. 3 in the morning, and the Canadian Lake Protective Association's annual meeting in the afternoon of the same day.

Steel Tank Vessels for Imperial Oil Co.

The Imperial Oil Co., Ltd., Toronto and Sarnia, Ont., ordered a steel oil tank vessel, from the Collingwood Shipbuilding Co., Collingwood, Ont., in June, 1915, for delivery on the opening of navigation this year, mention of which was made in Canadian Railway and Marine World for July, 1915. The company has ordered two additional vessels of similar type from the same place. They will be each 258 ft. long, 43 ft. beam and 18 ft. deep to main deck, with an expansion trunk 7½ ft. above the deck running fore and aft. They will be classed at Lloyd's for the highest classification for ocean going steamers, as they are intended, not only for the lake trade, but for transportation to Montreal, Quebec and Halifax.

A great many closely spaced bulkheads will be fitted athwartships, and a continuous longitudinal bulkhead will divide the hold spaces into 10 tanks for crude or refined oil, and four tanks for lubricating oil. A cross bunker for carrying oil fuel will be fitted forward of the boiler room. The pump room will be located at the fore end of the foremost tank, in which will be placed the large pumps for handling oil cargoes. They will be engined for a speed of 8 knots an hour when loaded.

The Coastwise Steamship and Barge Co., which operates the s.s. Amur between Vancouver and Granby Bay, is reported to have purchased the s.s. Turret Crown, for transporting coal, coke and ore on that route. The Turret Crown was built at Sunderland, England, in 1895, and is of steel with double bottom for watertight ballast. Her dimensions are, length 253 ft., breadth 44 ft. 4 ins., depth 19 ft. 4 ins.; tonnage, 1,827 gross, 1,142 register. She is equipped with triple expansion engines with cylinders 22, 36 and 59 ins. diam., by 39 ins. stroke, 1,100 i.h.p. at 70 r.p.m., and supplied with steam by 2 Scotch boilers 14 by 11 ft. at 180 lbs. She was formerly owned by Turret Crown, Ltd., Toronto, controlled by Mackenzie, Mann and Co. interests, and during 1915 was under charter to the Nova Scotia Steel and Coal Co., New Glasgow, N.S. She is stated to be refitting at Perth Amboy, N.J., after which she will operate between New York and the West Indies until the Panama Canal is reopened, when she will proceed to Vancouver.

The Imperial Merchant Service Guild held its annual meeting at Collingwood, Ont., Jan. 21, when considerable criticism was levelled at the Canada Shipping Act, which was characterized as in a large measure detrimental to the successful carrying on of navigation. It was claimed that 5% of the vessels on the Great Lakes are under equipped, as under the law it is not necessary to have a chart on board. The method of appointing lighthouse keepers, harbor masters and inspectors was also criticized, it being claimed that men often entirely unacquainted with the needs of seamen are appointed. The officers for the current year are:—Capt. W. C. Jordan, Collingwood, Chairman; Capt. W. Inkster, Collingwood, Secretary-Treasurer.

Sailing Vessels for Newfoundland.—It is reported that a number of wooden sailing vessels are under construction for the Newfoundland trade, which has been interfered with to a considerable extent, owing to the shortage of steam vessels and of men capable of handling them, due to war requirements. For some years past the export of fish has been carried on by steam vessels, which have latterly either been requisitioned by the Admiralty, or purchased by the Russian Government for service in ice, for which they are specially adapted.

Grand Trunk Pacific Coast Steamship Company's Steamship Records.

The following figures show the records of the steamships Prince Rupert and Prince George for the past season:

s.s. Prince Rupert, June 8 to Oct. 30—		Miles.
20 trips, Seattle to Prince Rupert and return	25,080	
11 trips, Seattle to Anyox and return....	15,818	
	40,898	
s.s. Prince George, June 10 to Nov. 2—		
20 trips, Seattle to Prince Rupert and return	25,080	
10 trips, Seattle to Anyox and return	11,380	
1 trip, no call at Victoria	1,235	
1 trip, Seattle, Victoria and Vancouver....	145	
	40,840	

The total time taken on these trips, including time spent in manoeuvring in harbors, and running slow during fogs, etc., was 103 days, 7 hrs., 34 mins., and the average distance per day was 395.86 miles. The average speed per hour was 16.49 knots; longest non-stop run, north and south, 482 miles, on which the vessels arrived on the average, 6 mins. and 10 mins. ahead of schedule time, on the north and south runs respectively.

Erie Canal Route for Canadian Grain.—Speaking before the Canadian Club in New York recently, Secretary of State Hugo, who is a member of the New York State Canal Board, is reported to have said:—"One of Canada's greatest economic problems and a threatening menace to her future prosperity—freight rates—will be solved to a large extent by the New York barge canal. Over half of the Canadian wheat exported in 1913 reached the Atlantic Ocean through Buffalo and New York, and with the greatly enlarged transportation capacities of the new canal, a big increase in the wheat export trade by way of New York City may be expected."

The Shipmasters' Association of the Great Lakes held its annual meeting at Toronto, Jan. 25 to 30, the first time its meeting has been held in Canada.

Atlantic and Pacific Ocean Marine.

The Cunard Co. is reported to be asking for tenders for building eight steamships for Atlantic service.

The Quebec Steamship Co., a subsidiary of Canada Steamship Lines, Ltd., has leased Pier 46, East River, New York, for six months.

The s.s. Shabonee put in at St. John's, Nfld., towards the end of December, having lost a propeller. The replacing was done by the Reid Newfoundland Co., without the vessel being docked.

The France and Canada Steamship Co., Ltd., incorporated in Montreal recently, has increased the number of its directors to nine. The President is E. G. Bennett, and W. J. Shaughnessy is Secretary.

It is reported that the s.s. Belgenland, now being completed at Belfast, Ireland, for the Red Star Line, will be transferred to the White Star Line for operation between Liverpool and New York. It is also stated that she will be renamed Homeric.

In connection with the taking over of the Johnston Line by Furness, Withy and Co., mentioned in a previous issue, it has now been announced that the latter company has acquired all the shares held by the Johnston family, and assumed entire control on Jan. 1.

The Great Northern Steamship Co.'s s.s. Minnesota, which sailed from San Francisco, Cal., recently for Great Britain, where

it was announced she was to be sold, had to put back with boiler trouble. It is now announced that extensive repairs, including the installation of new boilers, will be carried out before she again sails.

A report from New York states that the Canadian Pacific Ry. will have two new steamships completed in British shipbuilding yards for its trans-Pacific service, within three months. It is stated that Capt. Hopcraft, of the s.s. *Empress of Japan*, is to take charge of one of the vessels. They will, it is said, be 540 ft. long, and somewhat similar in size to the Canadian-Australian Line's s.s. *Niagara*.

The C.P.R. s.s. *Empress of Russia*, which has been refitted, after service from the commencement of the war as an auxiliary cruiser, is intended to sail from Hong Kong, China, Mar. 23, and from Vancouver on her first trip westward, Apr. 20, calling at Yokohama, Kobe, Nagasaki, and Manila. Thereafter the steamships *Empress of Russia* and the *Empress of Asia*, which is also being refitted at Hong Kong, after similar service, will sail every four weeks.

The Montreal Transportation Co.'s s.s. *Northmount* was reported recently to have been abandoned at sea, about Dec. 18, when bound from Newport News, Va., to Trinidad. The crew were picked up by the s.s. *Yaqui*, and landed at Turks Island. The *Northmount* was built at Dumbarton, Scotland, in 1908, and was of steel, with steel tank top, four watertight and two non watertight bulkheads, steel boiler house, steam pump wells, etc. Her dimensions were: length, 249 ft.; breadth, 43 ft.; depth, 19 ft. 5 ins.; tonnage, 1,908 gross, 1,172 register. She was equipped with triple expansion engines, with cylinders 18 x 30 x 48 ins. and 33 ins. stroke, 950 i.h.p. at 90 r.p.m., supplied with steam by two Scotch boilers 12½ by 11 ft., at 185 lbs. She had been engaged in grain traffic from the head of the lakes for some time, and during the war has been under charter for the West Indies service.

Maritime Provinces and Newfoundland.

The figures of export traffic from West St. John, N.B., for December, show that 38 steamships cleared with 181,370 tons of cargo and 1,166 horses, against 20 steamships with 60,346 tons of cargo and 1,262 horses in Dec., 1914.

The Victoria Steamship Co.'s annual meeting was held at St. John, N.B., Dec. 29 when the report showed that the year had been a successful one. An offer was received for the purchase of the controlling stock, on behalf of some St. John and Fredericton parties.

The St. John, N.B., harbor revenue for 1915 was \$122,362.80, against \$97,998.01 for the previous year. During December 38 vessels cleared with 1,166 horses and 181,370 tons of cargo, against 20 vessels with 1,262 horses and 60,346 tons of cargo in Dec., 1914. The custom receipts for 1915 were \$2,554,212.11, against \$1,540,788.85 for 1914, and pilotage receipts were \$36,143.28 and \$33,012.93 for the two years respectively.

The Black Diamond Steamship Co.'s s.s. *Coban* ran ashore at Placentia, Nfld., at the end of December, and it was stated that she might become a total loss. She was, however, released and taken to St. John's, where repairs were undertaken. It was found after she was docked that only certain minor repairs could be carried out, until a new stern frame and rudder could be obtained, so the vessel was floated out of the dock Jan. 11, and towed to Sydney, N.S., where the balance of her cargo was removed.

Province of Quebec Marine.

The overhauling of the Canada Steamships Lines' s.s. *Rapids King*, which was recently damaged by fire, has been completed at Sorel, Que. The damage was comparatively slight, and the overhauling did not include any change in the previous layout or decoration, the chief damage being in the saloon which was only slightly burned.

Ontario and the Great Lakes.

The Canadian Stewart Co.'s steam tug A. M. Stewart, which was completed at Glasgow, Scotland, recently for work on the Toronto Harbor improvements, has been requisitioned by the Admiralty.

The Interlake Steamship Co., Cleveland, Ohio, has purchased the Cleveland Steamship Co.'s business at a valuation of about \$3,000,000. The Cleveland Steamship Co. operated 13 vessels in the Great Lakes trade.

The United States Lake Survey reports the levels of the Great Lakes, for December, in feet above tidewater, as follows,—Superior, 602.72; Michigan and Huron, 579.51; Erie, 571.37; Ontario, 244.78. As compared with the average December levels for the past ten years, Superior was 0.47 ft. above; Michigan and Huron 0.63 ft. below; Erie 0.36 ft. below and Ontario 0.72 ft. below.

The s.s. *Turret Cape*, which was stranded at Cove Island, Georgian Bay, Nov. 7, 1911, and abandoned to the underwriters as a total loss, and subsequently repaired and purchased by the former owners, was formerly registered in England. The register there was closed Jan. 9, 1912, and since then she has been operated as an unregistered vessel. She has now been registered in Canada by the Canadian Ocean and Inland Navigation Co., Toronto.

A New York report states that a large shipping company is in process of formation in connection with Great Lakes shipping, which will take over all vessels hitherto owned or controlled by railway companies, which have now, under the Interstate Commerce Commission's ruling, to divorce their railway and steamship interests. It is stated that an expenditure of from \$7,000,000 to \$10,000,000 is contemplated. W. J. Conners, Buffalo, N.Y., is said to be interested in the matter.

G. R. Crowe Steamship Co., Ltd., has been incorporated under the Dominion Companies Act, with \$50,000 authorized capital, and office at Toronto, with power to own and operate steam and other vessels and to conduct a general navigation business, etc. The company has acquired the s.s. G. R. Crowe, formerly owned by the St. Lawrence and Chicago Steam Navigation Co., Toronto, the sale of which, to A. B. Mackay, Hamilton, Ont., and other details, were given in our last issue.

The Great Lakes Transportation Co.'s s.s. *Calgary* is being converted into an oil tanker at Baltimore, Md., and will be utilized in this trade on the ocean. Reports to the effect that she has recently changed owners, emanating from New York, are not correct. She was originally registered as being owned by James Richardson and Sons, Ltd., Kingston, Ont., but this was merely pending the organization of the Great Lakes Transportation Co., of which Jas. Playfair is President and General Manager, and H. W. Richardson, Kingston, is Vice President.

Russian Freight Rates.—It is announced that rates on grain traffic, except oats, between Russia and China, for export, have been considerably reduced.

British Columbia and Pacific Coast.

The construction of the Dominion Government grain elevator at Vancouver was expected to be completed by the end of January.

During December, 144,425 passengers were carried on the ferries between Vancouver and North Vancouver, a slight increase as compared with the previous month.

The north arm of Burrard Inlet was frozen over Jan. 3, and one of the Dominion Government steam tugs was dispatched from Vancouver to act as an icebreaker. This is the second time in 20 years that ice has caused any difficulty at this point.

Mainly About Marine People.

Miss Annabelle Murray, who died in Montreal recently, aged over 90, was the only daughter of the late William Murray, of that place, who founded the Beaver Steamships Line.

F. H. Clendenning, Division Freight Agent, British Columbia Coast Service, and Ocean Steamship Lines, C.P.R., Vancouver, has received word of the death of his brother, from wounds, while serving with the 24th Battalion of Montreal.

Sir Arthur A. Booth, who has been created a baronet, is Chairman of the Cunard Steamship Line, and has rendered special services during the war in connection with the transportation of munitions, men and war supplies in various parts of the world.

Lt.-Col. G. P. Murphy, Vice President, Ottawa Transportation Co., Ltd., who is in the Canadian Army Service Corps, and has been engaged on staff work since the war began, will, it is said, be added to the staff of Major General Carson, who specially represents the Canadian Minister of Militia in England.

F. F. Pickard, formerly Inspector of Hulls for Victoria, B.C., is reported to have been a passenger on the s.s. *Persia*, which was sunk by the enemy in the Mediterranean Sea recently. As a member of the Indian Marine Reserve he was ordered to report in London, Eng., about three months ago, and it is stated that he was ordered to take charge of some machine shops in Mesopotamia, whence he was bound at the time of the disaster. As no list of survivors has been published, it is not known if he is amongst those saved.

The Status of a Shipping Contract During War Time.

The case of James Carruthers and Co., Ltd., Montreal and elsewhere, and Danon Freres, Antwerp, Belgium, came before the King's Bench Division in London, England, recently, when a number of points arose as to the position of shippers in regard to contracts which were interfered with by the war. The first named firm were sellers of wheat under a c.i.f. contract, and had up to Sept. 15, 1914, to make deliveries. The latter firm, as buyers, sued for damages for failure to deliver, and the question arose as to whether there was a breach of contract, having regard to the conditions that existed during August and September of that year. The court was asked to say that non delivery was excused by the exception clauses in the contract, and whether there was prevention within that clause owing to the impossibility, as claimed, or difficulty of getting vessels at the material dates to carry freight from American ports for delivery at Antwerp. It was also asked to say if circumstances did not arise which discharged the parties from their obliga-

February, 1916.]

tions under the contract. The contract was made in Antwerp and had the usual prohibition and arbitration clauses. In the resulting arbitration the first award was against the sellers, but there were appeal proceedings before the Trade Committee, and the court was asked to review the findings. It was decided to remit the matter to the Appeal Committee for them to ascertain, if possible, and append to the case, the forms of bill of lading referred to in the sale contract and the charter party.

St. Lawrence and Chicago Steam Navigation Company's Annual Report.

The following report was submitted at the annual meeting in Toronto, Jan. 21, over the signatures of W. D. Matthews, President, and A. A. Wright, Managing Director: The season of 1915 has been one of the best in the company's history. Owing to the exceptional crop in the west, and the demand for iron ore, the highest rates since the year 1905, prevailed during the fall months, and prospects for the beginning of the season 1916 are decidedly encouraging. The steamship G. R. Crowe, not being entirely suitable for our trade, has been sold, and your directors are considering the policy of replacing her with a larger and more modern steamship as soon as practicable. The company's steamships have gone through the season virtually free of accidents and are all in first class condition. Our policy regarding insuring only part of our risk continues satisfactory, and the balance at credit of our insurance fund is \$135,689.67. The directors from the earnings of the season have declared a dividend of 10% and a bonus of 2% on the capital stock amounting to \$115,968, and, after payment of same, carried forward the balance, \$162,622.33, to the credit of profit and loss, making the balance at credit of that account \$393,791.88.

ASSETS AND LIABILITIES.

Four steamships, J. H. G. Hagarty, E. B. Osler, W. D. Matthews, Iroquois	\$1,120,000.00
Accounts receivable	631.86
Cash in bank and office	385,714.14
	<hr/>
	\$1,506,346.00
	<hr/>
Capital stock, fully paid	\$ 966,100.00
Accounts and bills payable	10,461.15
Insurance Fund	135,689.67
Balance of profit and loss carried forward	393,791.88
	<hr/>
	\$1,506,346.00

PROFIT AND LOSS ACCOUNT.

Balance forward Jan. 2, 1915	\$231,169.55
Steamship earnings	301,690.25
	<hr/>
	\$532,859.80
	<hr/>
Cost of management	\$ 23,099.92
Dividend 10% payable Jan. 3, 1916	\$96,610.00
Bonus 2% payable Jan. 3, 1916	19,328.00
	<hr/>
	115,968.00
Balance carried forward	393,791.88
	<hr/>
	\$532,859.80

The following are the directors for the current year:—W. D. Matthews, President; J. H. G. Hagarty, Vice President; Sir Edmund B. Osler, C. S. Gzowski, G. R. Crowe, Jas. Carruthers, S. Crangle and A. A. Wright, Managing Director.

British Columbia Merchant Marine, Limited.

As a result of numerous discussions in Vancouver, recently, it is announced that steps are being taken for the incorporation of a company with the name of The British

Columbia Merchant Marine, Ltd., with an authorized capital of \$2,500,000, divided into 250,000 shares of \$10 each, with a minimum subscription of \$250,000 before proceeding to allotment. No promotion expenses will be paid, nor will commission for the sale of stock be paid by stock, nor will any expense be incurred until it is assured that the minimum amount stated will be subscribed. It is proposed to build vessels, as well as charter or purchase them, for which cash will be raised by bonds, which it is anticipated will be guaranteed as to principal and interest by the B. C. Government. Agencies will be established, and for the present, the office of the Agent General in London, England, will be used, and when the business warrants, a separate office will be established. The directors are to be 15 in number, and the qualification 50 shares. A preliminary subscription list has been thrown open to the public, and a number of shares have been applied for. C. Gardner, Lloyd's representative in British Columbia, is interested in the project.

Oil Burning Tug in New York Harbor.

The first commercial oil burning tug in New York Harbor is the Mexpet, which went into service last summer. It is owned by the Mexican Petroleum Co. and is used for handling oil tankers and ocean vessels docking at the company's pier to fill its bunkers with fuel oil. The tug is 112 ft. overall and has a beam of 24½ ft. The hold is 14 ft. deep. The rudder is unusually large for ease in short turning. The boat has one Scotch boiler 14½ ft. in diameter by 12 ft. long, with three corrugated suspension furnaces 48 in. in diameter. The pressure carried is 165 lb. per sq. in. The mechanical fuel oil firing system is employed, there being two oil pumps and two heaters. The main engine is an inverted compound with 18 and 38-in. cylinders and a 26-in. stroke. In service the Mexpet has evaporated 16.4 lb. of water per pound of oil from and at 212 degrees F. Oil is sprayed at from 240 degrees to 280 degrees F. under 40 to 80-lb. pressure. The engine horsepower ranges from 650 to 750, and a speed of 10 knots has been developed. Ninety tons of fuel oil is carried, sufficient for 10 days run. A crew of 10 men is required.

Marconi Wireless Telegraph Company of Canada.

Following are extracts from the annual report for the year ended Jan. 31, 1915, issued recently: During the six months which elapsed before the outbreak of the war, the business continued to make normal and satisfactory progress. The range of the Cape Race station has been greatly increased by its equipment with steel masts 250 ft. high, in replacement of the 160 ft. wooden spars, and on the return to normal conditions there should be a marked improvement in the earnings of the station. The establishment of a well equipped factory in Montreal, with excellent shipping facilities, has been amply justified, and despite increasing difficulties in obtaining raw materials, the company has been able to meet all demands. During the year permanent stores and offices have been opened at Toronto and Vancouver. Message traffic to and from ships, which forms an important source of the company's revenue, and which prior to the war was showing a gratifying increase, has naturally been adversely affected by the severe censorship imposed, the general dislocation of passen-

ger traffic and the placing of important stations at the disposal of the Government. It is impossible at this time to fully relate the very important services your company has rendered to the naval authorities. Calls for assistance have been received almost daily, operators required at short notice for special duty, apparatus for urgent requirements installed practically on demand, and especially powerful installations for new stations supplied in record time. It is a tribute to the company's organization to record that in no single instance has it failed to fully meet the demands made upon it. In addition, the company has had to provide for the loss of trained operators and engineers who have enlisted for active service. Your directors have accordingly submitted appropriate claims to the naval authorities for compensation in respect of the reduced revenue of the various coast stations as compared with the corresponding period anterior to the war. This matter is still in abeyance, but your directors have reason to believe that an equitable settlement will be duly arranged. Practically the whole of the mercantile marine of Canadian and Newfoundland registry has now been equipped with Marconi wireless telegraph apparatus. Towards the close of the year the Newfoundland Government enacted legislation providing for the compulsory wireless equipment of all vessels engaged in the seal fishery. The company's transatlantic service has shown important gains in traffic despite the adverse conditions imposed by the war. The publicity campaign inaugurated by the board two years ago has made Marconi a household word among the cabling public and throughout Canada. The balance sheet showed net profit for the year \$50,020.11, less interest on advances \$28,956.49 an d balance of deposit account at Jan. 31, 1914, transferred, \$15,335.75, leaving a net balance of \$5,727.87.

The directors, who were re-elected, are: Andrew A. Allan, President; G. Marconi, Vice President; J. N. Greenshields, K.C.; Robert Bickerdike, M.P.; G. C. Isaacs, G. M. Bosworth, W. D. Birchall, E. J. Nally, J. H. Lauer, General Manager.

Telegraph, Telephone and Cable Matters.

The cable companies announced a temporary suspension of their deferred trans-Atlantic cable service recently.

The Association of Railway Telegraph Superintendents will hold its 35th annual meeting at St. Paul, Minn., June 20 to 22.

The Great North Western Telegraph Co. has completed the work at its new office at Ottawa, and is now operating Morkrum printing installations between Ottawa and Montreal and Ottawa and Toronto.

The Pacific Cable Board's report for the year 1914-15 shows traffic receipts \$1,106,400; other receipts \$18,825; total \$1,125,225; expenditures \$731,795; surplus \$393,430. The interest and sinking fund requirements were \$433,005, the deficit being provided by the British and Dominion Governments. The deficit was \$39,575 against a deficit for the previous year of \$60,175, and the net traffic receipts were \$126,125 more. The traffic at ordinary tariffs showed a decrease, but there was an increase in deferred traffic of 599,879 words, and in the week end traffic there was an increase of 747,332 words, practically 200%.

Among the Express Companies.

W. J. Alles has been appointed agent, Canadian Ex. Co., Berlin, Ont., vice E. Gelattly.

M. S. Anderson has been appointed agent,

Canadian Ex. Co., Regina, Sask., vice W. R. Perry.

A. Scholey has been appointed agent, Canadian Ex. Co., Prince George, B.C., vice G. Bennett.

D. F. Martin has been appointed route agent, Dominion Ex. Co., North Bay, Ont., vice W. Aitchison, promoted.

The Canadian Ex. Co. has opened offices at Abbotsford, Parent and St. Basile, Que., and Reaboro, Ont.

W. Aitchison, heretofore route agent, Dominion Ex. Co., North Bay, Ont., has been appointed agent at Windsor, Ont., vice C. F. Price, resigned.

The liquidator of the United States Ex. Co., D. I. Roberts, has made a second distribution of 25%. The first payment was distributed No. 15, 1915. The stock as at Dec. 1 was estimated at a total liquidation value of \$96.60 a share, including the 25% payment already mentioned.

The Canadian Ex. Co.'s revenues, expenses, etc., for Aug., 1915 and 1914, were as follows,—

	1915	1914.
Mileage of lines covered.....	10,238.13	9,676.50
Charges for transportation....	\$325,941	\$291,320
Express privileges, Dr.....	170,060	167,663
Operation other than transportation	5,370	5,494
Total operating revenue	161,250	149,131
Operating expenses	133,942	140,064
Net operating revenue	27,307	9,066
Express taxes	4,200	4,000
Operating income	23,094	5,066

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

John Millen & Son, Limited, Montreal, have sold their railway supply department to F. D. Lyman, who has been its manager since its inception some nine years ago, and it will in future be carried on by Lyman & Lyman, Limited.

M. Beatty & Sons, Limited, Welland, Ont., have received an order from the Confederation Construction Co., contractors, section 3, Welland Ship Canal, for 6 electric hoists, 2 of 50-h.p. with single drums, two 50-h.p. with double drums. They are to be used on the concrete handling plant, which the contractors are building this winter for use on the twin flight locks next spring.

Calendars for 1916 have been received from the W. W. Butler Co., Ltd., railway, marine and mining supplies, Montreal; Hart-Otis Car Co., Ltd., Montreal; Diamond Saw and Stamping Works, Buffalo, N.Y.; The Hiram L. Piper Co., Ltd., railway and steamship supplies, Montreal; John Bertram & Sons Co., Ltd., machinery manufacturers, Dundas, Ont.; Pratt and Whitney Co., of Canada, Ltd., Dundas, Ont.

Transportation Conventions in 1916.

March 21-23, 1916.—American Railway Engineering Association, Atlantic City, N.J.

May, 1916.—International Railway Fuel Association, Chicago, Ill.

May 2-5, 1916.—Air Brake Association, Atlanta, Ga.

May 19, 1916.—Association of Railway Claim Agents, Atlantic City, N.J.

June 20-22, 1916.—Association of Railway Telegraph Superintendents, St. Paul, Minn.

June 20-23, 1916.—American Association of Freight Agents, Cincinnati, Ohio.

June 21, 1916.—Train Despatchers' Association of America, Toronto.

June 21, 1916.—American Association of General Baggage Agents, Boston, Mass.

June 28, 1916.—Association of American Railway Accounting Officers, Detroit, Mich.

August, 1916.—International Railroad Blacksmiths' Association, Chicago, Ill.

September, 1916.—Master Car and Locomotive Painters' Association of United States and Canada, Wilmington, Del.

September, 1916.—Railway Signal Association, Mackinac Island, Mich.

Sept. 19-22, 1916.—Roadmasters and Maintenance of Way Association, Chicago, Ill.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated:

Canadian Car Service Bureau—J. Reilly, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.

Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July, and August.

Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Association—E. de la Hooke, London, Ont.

Dominion Marine Association—F. King, Counsel, Kingston, Ont.

Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.

Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.

Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.

Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.

International Water Lines Passenger Association—M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee—James Morrison, Montreal.

Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.

Quebec Transportation Club—A. F. Dion, Quebec.

Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.

Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.

Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.

Western Canada Railway Club—Louis Kon, Box 1707, Winnipeg. Meetings at Winnipeg, 2nd Monday each month, except June, July and August.

KETTLE VALLEY RAILWAY COMPANY.

NOTICE.—The Kettle Valley Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which the company may construct the following lines of railway—

(a) From a point at or near the Otter Summit by the most feasible route to the Aspen Grove mineral district in the Province of British Columbia, not exceeding thirty miles.

(b) From a point fifty miles to the north fork of the Kettle River, thence northerly by the most feasible route to Fire Valley, thence northwesterly following the general course of Fire Valley to Vernon, thence westerly to a junction with the line of the Nicols, Kamloops and Similkameen Coal and Railway Company at or near Quilchena.

(c) From a point on the line mentioned in paragraph (b) at or near the junction of the east fork and west fork of the north fork of Kettle River in a generally north-easterly direction to Franklin Camp, thence to Killarney.

(d) From a point at or near Hedley on the line to be constructed from Midway to Hedley northerly along Twenty Mile creek for a distance of about twenty miles.

Dated at Montreal, this 9th day of December, 1915.

H. C. OSWALD,

Secretary.

Pringle, Thompson, Burgess & Cote,
Ottawa agents.

CANADIAN PACIFIC RAILWAY CO.

Notice.—The Canadian Pacific Railway Company will apply to the Parliament of Canada, at its next session, for an Act amending and extending the powers of the company in respect of the issuance of consolidated debenture stock now or hereafter issued by the conversion thereof into denominations of Canadian currency.

Dated at Montreal, this 3rd day of January, 1916.

W. R. BAKER,

Secretary.

Pringle, Thompson, Burgess & Cote,
Ottawa agents.

KETTLE VALLEY RAILWAY COMPANY.

Notice.—The Kettle Valley Railway Company will apply to the Parliament of Canada, at its next session, for an Act ratifying and confirming an agreement dated the tenth day of July, one thousand nine hundred and fourteen, entered into between the Vancouver, Victoria and Eastern Railway and Navigation Company and The Kettle Valley Railway Company respecting a joint section from Princeton to Otter Summit.

Dated at Montreal, this 5th day of January, A.D. 1916.

H. C. OSWALD,

Secretary.

CANADIAN PACIFIC RAILWAY COMPANY.

NOTICE.—The Canadian Pacific Railway Company will apply to the Parliament of Canada, at its next session, for an Act:—

1. Extending the time within which the company may construct the following lines of railway—

(a) From a point on its Pheasant Hills Branch in Township 36 or 40, Range 19 or 20, west of the 3rd Meridian in a northerly and westerly direction towards the Battle River, thence westerly through Township 43, 44, or 45 to a point in Range 5 or 6, west of the 4th Meridian, thence southerly and westerly, crossing the said Pheasant Hills Branch to a junction with the Lacombe extension of the Calgary & Edmonton Railway in Township 36, 37 or 38, Range 11, 12 or 12, west of the 4th Meridian, a distance of about 180 miles;

(b) From a point in Township 6, 7, 8 or 9, Range 30, west of the 2nd Meridian in a westerly direction to a connection with the Crow's Nest Pass Branch, between Range 16, west of the 4th Meridian and Lethbridge, a distance of about 350 miles, or at a point on the Alberta Railway and Irrigation Company's railway in or near the Town of Sterling;

(c) From a point at or near Sedgewick on its Hardisty subdivision in a southerly direction to a point in Township 39 or 40, Range 11, 12 or 13, west of the 4th Meridian, in the Province of Alberta;

(d) From a point at or near Irricana in an easterly and southeasterly direction to a point in Township 20 or 21, Range 11 or 12, west of the 4th Meridian, in the Province of Alberta;

(e) From a point at or near Killam or some point in Township 44, Range 12, 13 or 14, west of the 4th Meridian in a northwesterly direction to a point at or near Strathcona, in the Province of Alberta.

2. Amending and extending the powers of the company in respect of the issuance of preferred shares now or hereafter issued by the conversion thereof into denominations of Canadian currency.

And for other purposes.

Dated at Montreal, this 9th day of December, 1915.

W. R. BAKER,

Secretary.

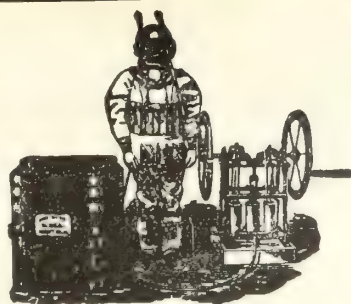
Pringle, Thompson, Burgess & Cote,
Ottawa agents.

*Rails, Cars,
Locomotives
and Contractors' Equipment*

**IMMEDIATE
SHIPMENT**

John J. Gartshore

58 FRONT ST. WEST
TORONTO

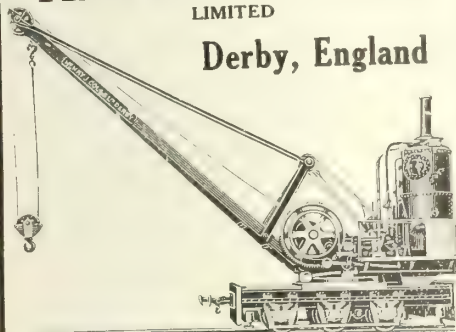


JOHN DATE
Manufacturer of
Diving Apparatus

For Sale or Hire
Brass Founder and Coppersmith
13-15 Concord St., Montreal

HENRY J. COLES
LIMITED

Derby, England



Makers of Steam and Electric Travelling Cranes, Overhead Electric Cranes, Single and Double Chain Grabs, Steam Navvies, Petrol and Oil Motor-driven Cranes, Shunting and Breakdown Cranes.

Telegrams: "Coles, Derby."

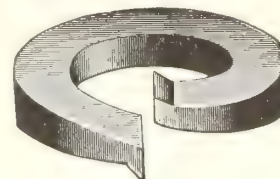
The Preston Car & Coach Co., Limited

PRESTON, ONT.

MANUFACTURERS OF

Steam and Electric
Railway Cars and
Special Cars.

The Positive Lock Washer
Is the BEST Nut LOCK for all purposes



We also make plain coils and tail-nut locks

The Positive Lock Washer Co.

Sole Mfrs., Newark, N.J.
F. H. HOPKINS & CO., Agents, Montreal

CONSOLIDATED

Electric Heaters are best; but if you want

**COAL-BURNING
VENTILATING HEATERS**

We have the Best

ASK US ABOUT IT NOW

Consolidated Car-Heating Co.

Albany N.Y., U.S.A.

Dawson and Co., Agents; 148 McGill St., Montreal, Que.

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Celebrated Wheel Truing Brake Shoe.
Best Wheel Grinders in the World.

**FOR TICKET CASES AND
COMMERCIAL FURNITURE**

of all descriptions to stock
or special design, apply to

The Canadian Office and School Furniture Co., Limited

Preston : Ontario

Car Closets

FLUSH OR DRY

DUNER CO. 101 S. CLINTON ST.
CHICAGO

**CALGARY AND EDMONTON RAILWAY
COMPANY.**

NOTICE.—The Calgary and Edmonton Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time within which the company may construct the following lines of railway:

(a) From a point of its Macleod Branch in Township 19, 20 or 21 in a westerly direction to a point on the south branch of Sheep Creek in Range 4, west of the 5th Meridian.

(b) From a point on the line described in paragraph (a) to a point on the north branch of Sheep Creek in Range 2, 3 or 4, west of the 5th Meridian, and

(c) From a point on the line described in paragraph (a) to a point on Trap Creek in Range 6, west of the 5th Meridian, all in the Province of Alberta.

Dated at Montreal, this 9th day of December, 1915. H. C. OSWALD,

Pringle, Thompson, Burgess & Cote,
Ottawa agents.

When a Patron Leaves the
Choice of a Beer

to your good judgment, serve him with

**DREWRY'S
American
STYLE RICE BEER**

He'll remember your house with
pleasure,— and will come again.

E. L. Drewry, Ltd., Winnipeg

**The Ottawa Car
Manufacturing Co., Limited**

Builders of

Electric Cars, Snow
Sweepers and Plows

Also

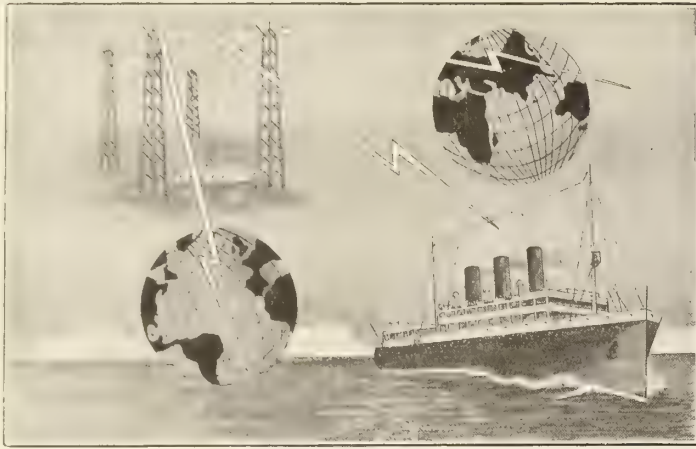
Producers of Brass
Castings of Every
Description.

Slater St. - Ottawa

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. BABBITTS. Miscellaneous Brass Castings for Railroads.

Works and Office: 69 DELORIMIER AVENUE, MONTREAL, QUE.



OF THE WORLD'S WIRELESS
STATIONS 80% ARE ON THE MARCONI SYSTEM.

LET US SUBMIT SUGGESTIONS !

MARCONI

WIRELESS TELEGRAPH APPARATUS

MADE IN CANADA.

Wireless equipment of all kinds supplied: Land, ship, railway and aeroplane sets with ranges of from 50 to 2,000 miles.

Have you considered the advantages of connecting up factory or mine to head office by wireless telegraphy?

SHIP SETS—Suitable for liners, yachts, tugs and freight boats and scows—our specialty.

Our stations may be hired or bought outright.

THE

Marconi Wireless Telegraph

Company of Canada, Limited

Shaughnessy Building,

Montreal

Hotel Dennis

ATLANTIC CITY, N. J.

An American Plan Hotel that for the past fifteen years has been under the same management and developed on lines that appeal to people of refined taste.

It has a superior location. It is thoroughly modern. It is a recognized standard of excellence.

Capacity 600.

WALTER J. BUZBY.

NICKEL SHOT—HIGH AND LOW CARBON INGOTS—TWO SIZES, 25-LB., 50-LB.

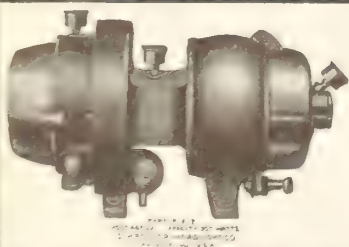
Electrolytic Nickel—99.80%

Prime Metals for the manufacture of Nickel Steel, German Silver, Anodes, and all remelting purposes. Our Nickel is produced as rods, sheets, strip stock, wire, and tubes.

METAL We are Sole Producers of this natural stronger than steel, non-corrodible alloy. Manufactured forms are rods, flats, castings, tubes, sheets, strip stock and wire. Ask for descriptive booklet.

Send inquiries direct to us.

THE INTERNATIONAL NICKEL COMPANY, - 43 Exchange Place, New York



70 Schroeder Incandescent Headlights

In Service

270 days without any expense for repairs. As a result of this exceptional service 150 more have just been ordered.

The HIRAM L. PIPER CO., Limited

MONTREAL, Sole Agents for Canada

“MORROW” Products are Guaranteed

They are used by nearly all the large Manufacturing Plants in the Dominion of Canada, and are to be had from the largest and most responsible Jobbing Houses from Coast to Coast.

John Morrow Screw & Nut Co., Limited

Ingersoll - - Ontario

Railway and Contractors' Equipment.

Freight and Passenger
Locomotives.

Freight Cars of All Types.
Passenger Coaches, Private
Cars.

Steam Shovels and Rails.

Inquiries Solicited

James T. Gardner

INCORPORATED

615 Railway Exchange, Chicago, Ill.

IT PAYS to carry an advertisement in the Canadian Railway and Marine World every issue of the year because you obtain **RESULTS** proportionately better



Which Method

prevails in your plant? Does it take two men to do one man's work.

Why don't you replace that old antiquated tool with a new up to date

Reece's New Screw Plate

These pictures do not exaggerate conditions as you can actually see them, if you will visit Machine Shops throughout the country.

Lessen your cost by giving your mechanics a REECE'S NEW SCREW PLATE.

BUTTERFIELD & CO., Inc.
ROCK ISLAND, QUE.



A Clear Track To Promotion

How to get off the side-track—how to break the couplings that hold them near the bottom of the pay roll—is the one big problem that troubles most railroaders.

There's a clear track to promotion—without grade or curve—open to the man that has the backbone and grit to take it. Before you can travel this track to promotion and bigger pay you must "coal up" with knowledge—you must be specially trained.

The Railway Instruction Department of the International Correspondence Schools is able and ready to give you the training you must have. You can get it right at home without losing an hour's time from your present job.

It will not cost anything to find out how the I.C.S. can train you for a better job. Put an "X" near the class of work you would like to follow, in the attached coupon, and mail it to the I.C.S. This won't obligate you in the least. It will simply bring full information by return mail.

Mark the Coupon NOW

International Correspondence Schools
Box 8401, Scranton, Pa.

Please explain, without obligation to you, how you can qualify for the position that interests you. X

Locomotive Engineer	Marine Engineer
Air-Brake Inspector	Ocean Navigation
Air-Brake Repairman	Lake Navigation
R. R. Shop Foreman	Coastwise Navigation
R. R. Traveling Engin'r	Electric Car Running
R. R. Construction Eng.	Electric Car Repairing
R. R. Accounting	House Wiring
Bookkeeper	Tel. and Tel. Engineer
Stenographer	Machine and Tool Repairing

Name _____

St. and No. _____

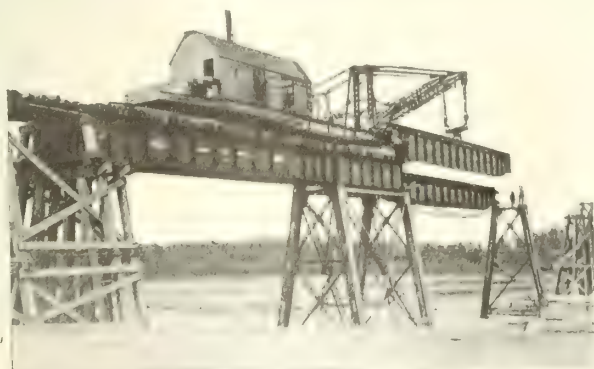
City _____

Present Occupation _____

Employed by _____

"BEATTY" HOISTS

For situation where the work is severe and the service exacting—"a Beatty always fills the bill"



Derrick car engined with an 8 x 12 four drum Beatty hoist placing an 80 foot deck plate girder span in Skugog River Bridge.

Let us know your requirements for

Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

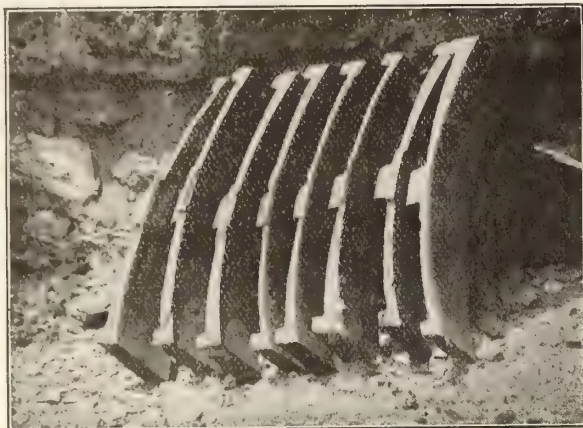
We will gladly send full information.

M. BEATTY & SONS Limited - WELLAND

Toronto Office—Goodyear Bldg. Telephone Adelaide 208.

Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg., Winnipeg.

STEEL BACK BRAKE SHOES



wear as shown above, before they are scrapped and they wear safely, too. You get your full money's worth in satisfactory service from them always.

Steel Back Car, Coach and Driver Shoes are absolutely essential for safe and economical operation in heavy and high-speed service.

Manufactured in Canada.

AMERICAN BRAKE SHOE & FOUNDRY CO.

The HOLDEN CO., Ltd., Agents, 354 St. James St., Montreal.

Awarded Gold Medal Panama-Pacific Exposition.

Hunt-Spiller Gun Iron

IN

LOCOMOTIVE CASTINGS

SAVES MONEY,

INCREASES: Engine Efficiency—Engine Mileage.

DECREASES: Engine Failures—Engine Repairs.

Made Only by

Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.

J. G. Platt,
Sales Manager.

Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.



STANDARD Signal Wire

will give dependability to your electric circuits and reduce maintenance cost.

Recommended by years of successful service on some of the largest signal systems on the continent.

Write our nearest office for further information.

Standard Underground Cable Co., of Canada, Limited

Hamilton, Ontario

Montreal Que. Winnipeg, Man.
Seattle, Wash.

ESTABLISHED 1849.

BRADSTREET'S

Capital and Surplus, \$1,500,000.

Offices throughout the Civilized World.

Executive Offices:

NOS. 346 and 348 BROADWAY,
N. Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished, and are available only by reputable wholesale, jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA: Halifax, N.S.; Hamilton, Ont.; London, Ont.; Montreal, Que.; Ottawa, Ont.; Quebec, Que.; St. John, N.B.; Toronto, Ont.; Vancouver, B.C.; Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.; Victoria, B.C.

THOS. C. IRVING,
Gen. Man. Western Canada, Toronto.



Capital Authorized\$10,000,000
Capital Paid-up 7,000,000
Reserve Fund 7,000,000

Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts Issued, available in all parts of the world.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates. Branches throughout the Dominion of Canada.

February, 1916.]

Professional Cards**ANGUS SINCLAIR, C.E.**

RAILWAY CONTRACTOR

Office: Imperial Bank Building
King and Sherbourne Sts., Toronto**The TERRY & TENCH CO., Inc**Bridge Builders, Manufacturers of Der-
ricks, Erection Plant and Shipyard
Cranes. Contractors, Structural Steel,
Erection.Grand Central Terminal. Room 5717,
New York, N.Y.**THE ARNOLD COMPANY**ENGINEERS—CONSTRUCTORS.
ELECTRICAL—CIVIL—MECHANICAL
Reports, Design and ConstructionComplete Railway Shop and Terminal Properties—
Electrification of Steam Railroads.Our Experience Covers Thirty Five Plants
Chicago, Illinois**JACOBS & DAVIES, Inc.**

Consulting Engineers

MONTREAL LONDON NEW YORK

Foundations, Subaqueous and Land Tunnels, Sub-
ways, Railways, Harbours, Waterpower Develop-
ment, Examinations, Reports.

Montreal Office: Eastern Townships Bank Building

Patent Solicitors**PATENTS SECURED OR OUR
FEES RETURNED.**Being next door to the Patent Office, we have personal
interviews with Examiners, thus earlier allowance of
your Patents. We have access to all Records and solicit
the business of Manufacturers, Engineers, and others
who realize the advisability of having their Patent
business transacted by Experts.HAROLD C. SHIPMAN & CO. REG. PATENT ATTORNEYS
Ottawa, Canada**VAN-HALLEN & O'NEAL**

REGISTERED ATTORNEYS

at Washington and Solicitors of Canadian
and Foreign Patents, Copyrights, Trade
Marks, Searches.Head Office, 103 Farmer Bldg., 333 Main Street,
WINNIPEG, MAN., Canada.**ROSS THOMSON & CO.**Mechanical and Electrical Engineers,
Patent Attorneys.Send for free book Patent Protection.
HQPE CHAMBERS, OTTAWA, ONT.**PATENTS**

HERBERT J. S. DENNISON,

Mechanical Engineer. Patent Attorney and Expert.
Patents, Trade Marks, Designs, Copyrights, and
Infringements.20 yrs. experience in Patents and Practical Engineering
Star Building, 18 King St. West, Toronto.

Write For Booklet

ROBERT W. HUNT,
THOS. C. IRVING, JR.,CHARLES WARNOCK,
JAS. W. MOFFAT,**ROBERT W. HUNT & CO., LIMITED**CONSULTING AND INSPECTING ENGINEERS
CHEMISTS AND METALLURGISTSExpert examination and tests of all steel and iron products;
Bridges, Buildings, Cement; Electrical and Mechanical Plant
Equipment; Rails and Fastenings; Cars; Locomotives; Pipe;
Lumber; Paving Materials.Resident inspectors at all important manufacturing centres in
Canada, the United States and Great Britain.

REPORTS ON PROPERTIES AND PROCESSES.

Head Office and Laboratories:

McGill Building,

Branches: TORONTO

VANCOUVER

MONTREAL, QUE.

LONDON, ENGLAND

Showing the construction of
our geared jacks.**Celebrated "H & E"
Lifting Jack**Our Patent Ball-Bearing
Geared Jacks are Ideal in
Railroad and heavy Con-
struction Work.These Jacks are built for heavy
service in bridge, roundhouse and
wrecking work, are made with
great care from the very best ma-
terial and will be found the most
satisfactory jacks for the purpose
on the market.**High Grade Electric
STEEL CASTINGS
MANGANESE STEEL**For Crusher Jaws and Heavy
Wear Parts**BRONZE**M.C.B. Standard Journal Bearings
and Engine Bearings

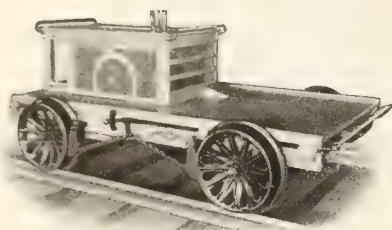
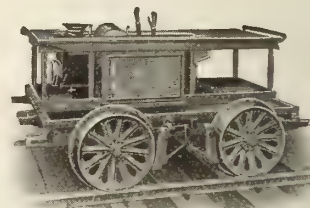
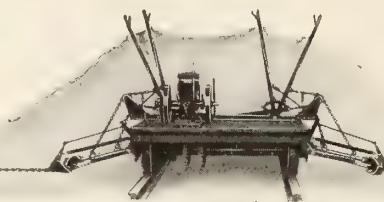
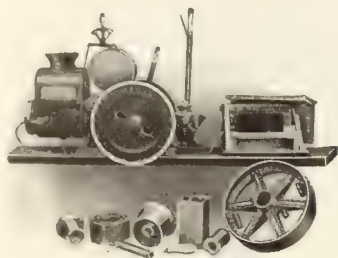
Improved Reinforced Steel-Backed

BRAKESHOESLocomotive Driver and Truck
Shoes. Freight and Passenger Car
and Electric Car Shoes.**Canadian Brakeshoe Company, Limited**

SHERBROOKE, QUE.

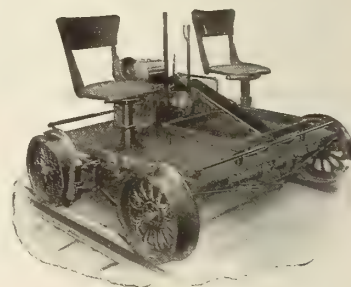
Sole Agents for Brakeshoes for Canada outside of B.C., Messrs. Taylor & Arnold, Limited,
Montreal and Winnipeg. Sole Agents for B.C., The B.C. Equipment Co., Vancouver, B.C.
Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.**MALLEABLE IRON CASTINGS**Our experience and unexcelled equipment assure you the best service
in high class castings.We also manufacture a full line of malleable cast iron and flanged pipe
fittings.**International Malleable Iron Co., Limited**
GUELPH, ONTARIO**Complete Hydraulic Equipment
For Railway and Ship Building Plants**Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc.
Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast
Iron Pipe, Hydrants, Valves and Fittings, etc.**R. D. WOOD & CO.****Philadelphia, Pa.**

FAIRMONT WINS GOLD MEDAL



The excellence of FAIRMONT Railway Motor Cars is attested by their receiving the highest competitive award, a gold medal, at the Panama-Pacific International Exposition, San Francisco.

Years of good service on Canadian railroads has proven the justice of this award. When you need a motor car, specify "FAIRMONT". Instalment terms to private buyers.



FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

Formerly Fairmont Machine Co. - 445 N. MAIN ST., FAIRMONT, MINNESOTA, U.S.A.

KINNEAR

STEEL ROLLING DOORS & SHUTTERS
BI-FOLDING & SLIDING DOORS
APPROVED FIRE DOORS

FOR PIER SHEDS-FREIGHT HOUSES-ROUND HOUSES & SHOPS

THE KINNEAR MFG. CO.
COLUMBUS, OHIO. U. S. A.

CANADIAN REPRESENTATIVES

EASTERN & CENTRAL
MUSSENS LTD MONTREAL

BRITISH COLUMBIA
W. N. O'NEIL & CO. VANCOUVER



CHICAGO CAR HEATING CO.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES.

CANADIAN FACTORY AND OFFICE—61 DALHOUSIE ST., MONTREAL A. D. BRUCE, Agent

GENERAL OFFICES:

RAILWAY EXCHANGE, CHICAGO, U.S.A.
NEW YORK, GRAND CENTRAL TERMINAL BLDG.
ATLANTA, GA., CANDLER BLDG.
WASHINGTON, D.C., MUNSEY BLDG.

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies

ACETYLENE
Commercial Acetylene Ry., Lt. & Sig. Co.

AERATED WATERS

E. L. Drewry
AIR BRAKES AND FITTINGS
Canadian Westinghouse Co.

ALLES
E. L. Drewry

ANGLE BARS
Steel Co. of Canada

AUTOMOBILES
Preston Car & Coach Co.

AXLES
Nova Scotia Steel and Coal Co.
Jas. W. Pyke & Co.
Steel Co. of Canada

BATTERIES, DRY
Canadian National Carbon Co.

BATTERIES, SIGNAL
Canadian National Carbon Co.

BATTERIES, STORAGE
Canadian National Carbon Co.

BATTERIES, TRACK
Canadian National Carbon Co.

BATTERY SUPPLIES
Canadian National Carbon Co.

BEACONS
Safety Car Htg. & Ltg. Co.

BOILER COMPOUND
Dearborn Chemical Co. of Canada

BOILERS
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works

BOILERS, PORTABLE
F. H. Hopkins & Co.
Polson Iron Works

BOILERS, STATIONARY AND MARINE
Polson Iron Works

BOILERS, STEAM
Polson Iron Works

BOILERS, WATER TUBE
Babcock & Wilcox
Polson Iron Works

BOLTS AND NUTS
Steel Co. of Canada

BOLTS, TRACK
F. H. Hopkins & Co.
Nova Scotia Steel & Coal Co.
Steel Co. of Canada

BORERS, CAR WHEEL
John Bertram & Sons Co.

BRAKE BEAMS
Buffalo Brake Beam Co.

BRAKE SHOES
Amer. Brake Shoe & Fdry. Co.
Canadian Brakeshoe Co.

BRIDGE NUMBERS
Acton Burrows, Limited

BRIDGES
Canadian Bridge Co.
Dominion Bridge Co.

BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION
Canadian National Carbon Co.

BUCKETS, COAL, ORE AND CONCRETE
M. Beatty & Sons
Brown Hoisting Machinery Co.
F. H. Hopkins & Co.

BUILDINGS, STEEL
Canadian Bridge Co.
Dominion Bridge Co.

BUMPING POSTS
F. H. Hopkins & Co.

CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED
Standard Und. Cable Co. of Can.

CARBONS, ARC LAMP, FLARE ARC AND PHOTOGRAPHIC
Canadian National Carbon Co.

CARBON SPECIALTIES
Canadian National Carbon Co.

CAR ROOFING
Franklin Railway Supply Co.
F. H. Hopkins & Co.

CAR SIGNAL SYSTEMS
Ohio Brass Co.

CASTINGS
Crossen Car Co.

CASTINGS, BRASS
Canadian Bronze, Limited

CARS

Crossen Car Co.
J. T. Gardner
Hart-Otis Car Co.
National Steel Car Co.
Ottawa Car Mfg. Co.
Preston Car & Coach Co.

CASTINGS, CAR
Amer. Brake Shoe & Fdry. Co.

CASTINGS, IRON
Hunt-Spiller Manufacturing Corp.

CASTINGS, IRON AND STEEL
Amer. Brake Shoe & Fdry. Co.
Dominion Steel Foundry Co.

CASTINGS, MALLEABLE
International Mall. Iron Co.
Taylor & Arnold

CASTINGS, MANGANESE STEEL
Canadian Steel Foundries, Ltd.

CASTINGS, STEEL
Dominion Steel Foundry

CATENARY MATERIALS
Ohio Brass Co.

CHAINS
B. J. Coghlin Co.
F. H. Hopkins & Co.

CLOSETS, CAR
Duner Co.

COAL
Nova Scotia Steel and Coal Co.

COMPRESSORS, AIR
F. H. Hopkins & Co.

CONCRETE MIXERS & ROCK CRUSHERS
F. H. Hopkins & Co.

CONTRACTORS' SUPPLIES
F. H. Hopkins & Co.
Rice Lewis & Son

CONVEYORS, COAL AND ASH
Babcock & Wilcox

COPPER, RODS AND WIRE
Standard Und. Cable Co. of Can.

COUPLERS, CAR & LOCOMOTIVE
Canadian Steel Foundries, Ltd.
Ohio Brass Co.
Taylor & Arnold

CRANES
Brown Hoisting Machinery Co.
Coles, Henry J.
F. H. Hopkins & Co.

CRANES, WRECKING
Coles, Henry J.
F. H. Hopkins & Co.

CRANES, ELECTRIC
Babcock & Wilcox
Coles, Henry J.
Dominion Bridge Co.
F. H. Hopkins & Co.

CRANES, TRAVELLING
Coles, Henry J.
F. H. Hopkins & Co.

CROWBARS
B. J. Coghlin Co.

CULVERTS
Pedlar People, Ltd.

CURTAINS AND FIXTURES, CAR
Du Pont Fabrikoid Co.
Preston Car & Coach Co.

CUTS
Acton Burrows, Limited

DERRICKS
M. Beatty & Sons
F. H. Hopkins & Co.

DIES
Butterfield & Co.

DITCHERS
M. Beatty & Sons
F. H. Hopkins & Co.

DIVING OUTFITS
John Date
F. H. Hopkins & Co.

DOORS, STEEL ROLLING
Kinneair Manufacturing Co.

DOOR SIGNS
Acton Burrows, Limited

DRAFT GEAR
Standard Coupler Co.

DREDGES
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works

DRILLS
John Morrow Srew & Nut Co.

DRILLS, AIR
F. H. Hopkins & Co.
Independent Pneumatic Tool Co.

DRILLS, WELL

F. H. Hopkins & Co.

DUMP CARS, CONTRACTORS'
Hart-Otis Car Co.
F. H. Hopkins & Co.

DYNAMO AND ELECTRIC CASTINGS
Amer. Brake Shoe & Fdry. Co.

ECONOMIZERS
Babcock & Wilcox

ELECTRIC CAR ROUTE SIGNS
Acton Burrows, Limited
Preston Car & Coach Co.

ENAMELED IRON SIGNS
Acton Burrows, Limited

ENGINES, AUTOMATIC
Polson Iron Works

ENGINES, HOISTING
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works

ENGINES, STATIONARY AND MARINE
Polson Iron Works

ENGINES, STEAM
F. H. Hopkins & Co.

EXPRESS OFFICE SIGNS
Acton Burrows, Limited

FARE BOX HOLDERS
Coleman Fare Box Co.

FARE BOXES, P.A.Y.E. OPERATION
Coleman Fare Box Co.

FILES
Nicholson File Co.

FORGINGS
Champion Machine & Fdry. Co.
Crossen Car Co.
Nova Scotia Steel & Coal Co.
Steel Co. of Canada

FURNACES, OIL AND GAS
Railway Materials Co.

GAUGE COCKS
Ohio Brass Co.

GAUGES, LOCOMOTIVE
Taylor & Arnold

GRATES, SHAKING
Babcock & Wilcox
Polson Iron Works

HAMMERS, CAST STEEL
Amer. Brake Shoe & Fdry. Co.

HANDCARS
Crossen Car Co.
F. H. Hopkins & Co.
Rice Lewis & Son

HANGERS, CABLE
Standard Und. Cable Co. of Can.

HEADLIGHTS
Commercial Acetylene Ry. Lt. and Sig. Co.
Safety Car Htg. & Ltg. Co.

HEADLININGS
Crossen Car Co.

HEATING, CAR
Chicago Car Heating Co.
Consolidated Car Heating Co.
Safety Car Htg. & Ltg. Co.

HOISTS, PNEUMATIC
Taylor & Arnold

HOISTS, STEAM
M. Beatty & Sons

HOOKS
Steel Co. of Canada

HOPPERS, CAR, WET OR DRY
Duner Co.

HOSE, AIR BRAKE AND STEAM
Can. H. W. Johns-Manville Co.
Safety Car Htg. & Ltg. Co.

ILLUSTRATIONS
Acton Burrows, Limited

INSPECTIONS
R. W. Hunt & Co.

INSULATORS, PORCELAIN
Ohio Brass Co.

INSURANCE, ACCIDENT
Imperial Guar. & Acc. Ins. Co.

INTERLOCKING PLANT AND SIGNALS
Canadian Steel Foundries, Ltd.
Gen. Railway Signal Co. of Can.

IRON AND STEEL BARS
Steel Co. of Canada

IRON, PIG
Nova Scotia Steel and Coal Co.
Steel Co. of Canada

IRON SIGNS
Acton Burrows, Limited

JACKS
Canadian Brakeshoe Co.
Canadian Steel Foundries, Ltd.
F. H. Hopkins & Co.
A. O. Norton, Limited

JOURNAL BEARINGS
Canadian Bronze, Limited
Crossen Car Co.
Jas. W. Pyke & Co.

LAGER BEER, ETC.
E. L. Drewry

LAGGING AND COVERING, LOCOMOTIVE
Taylor & Arnold

LAMPS AND LANTERNS
F. H. Hopkins & Co.
The Hiram L. Piper Co.

LAMPS, GAS
Commercial Acetylene Ry. Lt. and Sig. Co.

LAMPS, INCANDESCENT
Canadian Westinghouse Co.

LATHES
John Bertram & Sons Co.

LIGHTING, BUOY
Safety Car Heating & Light. Co.

LIGHTING, CAR
Commercial Acetylene Ry. Lt. and Sig. Co.
Safety Car Htg. and Ltg. Co.

LIGHTING, SIGNAL
Commercial Acetylene Ry. Lt. and Sig. Co.

LIGHTS, CONTRACTORS' AND WRECKING
F. H. Hopkins & Co.

LINE MATERIAL
Ohio Brass Co.

LOCOMOTIVES, CONTRACTORS'
Canadian Locomotive Co.
Montreal Locomotive Works
F. H. Hopkins & Co.

LOCOMOTIVES, ELECTRIC
Montreal Locomotive works

LOCOMOTIVES, LOGGING
Canadian Locomotive Co.
F. H. Hopkins & Co.
Montreal Locomotive Works

LOCOMOTIVES, RACK
Canadian Locomotive Co.
Montreal Locomotive Works

LOCOMOTIVES, STEAM
Canadian Locomotive Co.
J. T. Gardner
F. H. Hopkins & Co.
Montreal Locomotive Works

LORRIES, TRACKLAYING
Crossen Car Co.
F. H. Hopkins & Co.

LUBRICATORS
Canadian Detroit Lubricator Co.
Taylor & Arnold

MACHINES AND PLANT, CONTRACTORS'
M. Beatty & Sons
J. T. Gardner
F. H. Hopkins & Co.

MACHINES, BORING AND TURNING
John Bertram & Sons Co.

MACHINES, CAR SHOP
John Bertram & Sons Co.

MACHINES, CEMENT
Jas. W. Pyke & Co.

MACHINES, DRILLING
John Bertram & Sons Co.

MACHINES, HOISTING
M. Beatty & Sons
Brown Hoisting Machinery Co.

MACHINES, HYDRAULIC
R. D. Wood & Co.

MACHINES, MILLING
John Bertram & Sons Co.

MACHINES, PLANING AND SHAPING
John Bertram & Sons Co.

Flange Lubrication Should be Automatic

Flange lubrication to be efficient should be automatic, absolutely independent of your engineer, and at the same time the device itself should be so simple and yet so accurate that it will be practically trouble proof. The

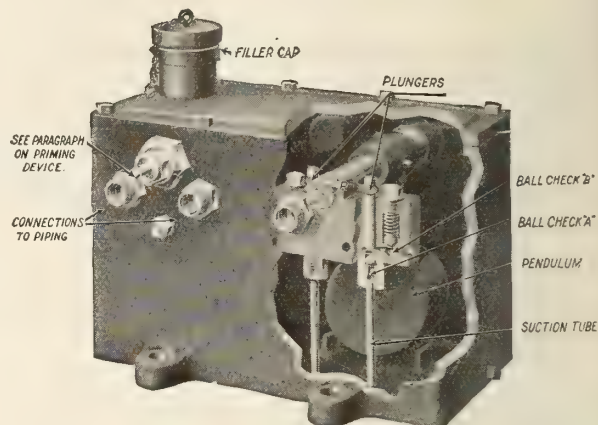
Detroit Automatic Flange Lubricator (Pendulum Type)

is absolutely automatic and at the same time simple. It is all in the pendulum. Any lateral movement of the locomotive causes the pendulum to swing. This oscillation rotates, rocker-like, the pendulum shaft, which produces alternating strokes of the two plungers in the pumping unit.

The use of the Detroit Automatic Flange Lubricator insures positive lubrication just when it is needed. May we send booklet F-O 81? It contains all the facts as well as drawings. Write to-day.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.
WALKERVILLE, ONT.

Canadian Sales Agents: Taylor & Arnold, Ltd., Montreal.



The Imperial Guarantee and Accident Insurance Co. of Canada

Imperial Protection

Accident and Sickness Insurance

Guarantee Bonds

Plate Glass and Automobile Insurance

A Strong Canadian Company

Head Office, 44 King St. W., Toronto, Ont.

Branch Offices:

Montreal, Que., Canada Life Bldg.

Winnipeg, Man., Merchants Bank Bldg.

Calgary, Alta., Canada Life Bldg.

Vancouver, B.C., 546 Pender St. W.

THE CANADIAN BRIDGE CO., Limited

WALKERVILLE, ONTARIO

LOCOMOTIVE

TURNTABLES

ROOFS

STEEL BUILDINGS

Manufacturers of

Railway and Highway

BRIDGES

STRUCTURAL

IRON WORK

OF ALL

DESCRIPTIONS

RAILWAY EXCHANGE

CHICAGO

FERGUSON SHOP FURNACES
MANUFACTURED IN CANADA
THE RAILWAY MATERIALS CO.

SINGER BUILDING

NEW YORK

C. W. Sherman, Pres. and Gen. Mgr.

F. W. Baillie, Vice-Pres.

J. E. Hammond, Secy.-Treas.

Dominion Steel Foundry Company, Limited, Hamilton, Ont.

Locomotive Frames

Car Bolsters

Car Castings

Heavy Machinery Castings

February, 1916.]

MACHINES, RADIAL DRILLING

John Bertram & Sons Co.
MACHINES, RAIL DRILLING
 F. H. Hopkins & Co.
MACHINES, RIVETTING
 Long & Allstatter Co.
MACHINES, SLOTTING
 John Bertram & Sons Co.
MACHINES, TRACKLAYING
 F. H. Hopkins & Co.
MACHINE TOOLS
 John Bertram & Sons Co.
 Pratt & Whitney Co.

MANHOLE FRAMES & COVERS

Amer. Brake Shoe & Fdry. Co.

MARINE REPAIRS

Goldschmidt Thermit Co.

MARINE SUPPLIES

Rice Lewis & Son

METALS

Goldschmidt Thermit Co.

METAL WORK, STRUCTURAL

Canadian Bridge Co.
 Dominion Bridge Co.
 Jas. W. Pyke & Co.

MILEPOST NUMBERS

Acton Burrows, Limited

MONEL METAL

International Nickel Co.

MOTOR CARS

Fairmont Gas Eng. and Ry.
 Motor Car Co.

MOTORS, TURNTABLE

Taylor & Arnold

NAILS, CUT AND WIRE

Steel Co. of Canada

NICKLE, SHEET, ROD, WIRE & TUBE

International Nickel Co.

NICKEL, METALLIC SHOT & INGOTS

International Nickel Co.

NUMBERS

Acton Burrows, Limited

NUT LOCKS

Positive Lock Washer Co.

OFFICE FITTINGS

Can. Office & School Furn. Co.

OFFICE SIGNS

Acton Burrows, Limited

OILS

Galena-Signal Oil Co.

PACKING

Garlock Packing Co.

PILE DRIVERS, RAILWAY

F. H. Hopkins & Co.

PIPE, STEAM

Babcock & Wilcox

PIPE STOCKS

Butterfield & Co.

PIPE, WROUGHT LEAD AND GALVANIZED

Steel Co. of Canada

PLANERS

John Bertram & Sons Co.

PLATFORMS, STEEL

Standard Coupler Co.

PLOUGHS, CONTRACTORS'

F. H. Hopkins & Co.

PORTER

E. L. Drewry

PUMPS

F. H. Hopkins & Co.

PUMPS, CENTRIFUGAL

M. Beatty & Sons
 F. H. Hopkins & Co.
 R. D. Wood & Co.

PUNCHES AND SHEARS

Long & Allstatter Co.

PUTTY

Steel Co. of Canada

RAIL BONDS

Ohio Brass Co.
 Elec. Railway Improvement Co.

RAIL BENDERS

Canadian Steel Foundries, Ltd.

RAIL JOINTS

Goldschmidt Thermit Co.
 The Rail Joint Co. of Canada

RAILS, NEW

Algoma Steel Corporation
 Dominion Iron & Steel Co.

J. T. Gardner
 J. J. Gartshore
 F. H. Hopkins & Co.

RAILS FOR RELAYING

J. J. Gartshore
 Jas. W. Pyke & Co.

RAILWAY SUPPLIES

Franklin Railway Supply Co.
 F. H. Hopkins & Co.
 Rice Lewis & Son
 The Hiram L. Piper Co.

REAMERS

Butterfield & Co.

REPLACERS, CAR AND LOCO-

MOTIVE
 F. H. Hopkins & Co.

RIVETS

Steel Co. of Canada, Ltd.

ROCK CRUSHERS

F. H. Hopkins & Co.

ROPES, DERRICK

Dominion Wire Rope Co.

RUBBER GOODS

Can. Consolidated Rubber Co.

SANDERS, PNEUMATIC

Ohio Brass Co.

SAWS, HACK

Diamond Saw & Stamping Co.

SCOWS, DUMP AND DECK

M. Beatty & Sons

SCREW PLATES

Butterfield & Co.

SCRAPERS, WHEEL AND DRAG

F. H. Hopkins & Co.

SCREWS, WOOD AND MACHINE

John Morrow Screw and Nut Co.
 Steel Co. of Canada

SEMAPHORE ARMS

Acton Burrows, Limited

SHIPS

Polson Iron Works

SIGNAL HOUSE NUMBERS

Acton Burrows, Limited

SIGNALS

Gen. Railway Signal Co. of Can.
 The Hiram L. Piper Co.

SIGNS

Acton Burrows, Limited

SKYLIGHTS

Kinnear Manufacturing Co.

SNOW PLOUGHS

Crossen Car Co.
 F. H. Hopkins & Co.

SPIKES, RAILWAY, SHIP OR PRESSED

Nova Scotia Steel and Coal Co.
 Steel Co. of Canada

SPICING TUBES AND COM-

POUNDS
 Standard Und. Cable Co. of Can.

SPREADER CARS

F. H. Hopkins & Co.

SPRINGS

Canadian Steel Foundries, Ltd.
 B. J. Coghlin & Co.

SPRINKLERS, ELECTRIC

Preston Car & Coach Co.

STAPLES

Steel Co. of Canada

STATION NAME SIGNS

Acton Burrows, Limited

STAYBOLT IRON

Taylor & Arnold

STAYBOLTS, FLEXIBLE

Flannery Bolt Co.

STAYBOLTS, LOCOMOTIVE

Flannery Bolt Co.

STAYBOLT TAPS

Butterfield & Co.

STEAM HAMMERS

John Bertram & Sons Co.

STEAM SHOVELS

M. Beatty & Sons
 F. H. Hopkins & Co.

STEAMSHIP SIGNS

Acton Burrows, Limited

STEAM TRAPS

Safety Car Htg. & Ltg. Co.

STEEL

F. H. Hopkins & Co.
 Nova Scotia Steel and Coal Co.

STEEL, FIRE BOX

Taylor & Arnold
 Canadian Steel Foundries, Ltd.

STEEL FOR AXES

Canadian Steel Foundries, Ltd.

STEEL FOR SAWS

Canadian Steel Foundries, Ltd.

STEEL FOR TIRES

Steel Co. of Canada

STEEL SHAFTING

Nova Scotia Steel and Coal Co.

STEEL PLATES

Jas. W. Pyke & Co.

STEEL, TOOL

Canadian Steel Foundries, Ltd.
 F. H. Hopkins & Co.

STOKERS, MECHANICAL

Babcock & Wilcox

STRAINERS

Babcock & Wilcox

SUPERHEATERS

Babcock & Wilcox
 Locomotive Superheater Co.

SWITCH TARGETS

Acton Burrows, Limited

TACKS

Steel Co. of Canada

TANKS AND TANK FIXTURES

F. H. Hopkins & Co.
 Polson Iron Works

TANKS, PORTABLE ACETY-

LENE, WELDING
 Commercial Acetylene Ry. Lt.
 and Sig. Co.

TAPS

Butterfield & Co.

TELEGRAPH AND TELEPHONE

OFFICE SIGNS
 Acton Burrows, Limited

TERMINALS, JUNCTION BOXES

Standard Und. Cable Co. of Can.

THERMIT

Goldschmidt Thermit Co.

TIE PLATES

Algoma Steel Corporation
 B. J. Coghlin
 Nova Scotia Steel & Coal Co.
 Steel Co. of Canada

TICKET CASES

Canadian Office & School Fur. Co.

TIRES, STEEL

Jas. W. Pyke & Co.

TOOLS AND SUPPLIES

F. H. Hopkins & Co.
 Pratt & Whitney Co.
 Amer. Brake Shoe & Fdry. Co.

TOOLS, CAST STEEL

John Bertram & Sons Co.
 Canadian Steel Foundries, Ltd.
 B. J. Coghlin Co.
 F. H. Hopkins & Co.

TOOLS, TRACK

Independent Pneumatic Tool Co.

TOOLS, PNEUMATIC

Independent Pneumatic Tool Co.

TRAMWAY EQUIPMENT

J. J. Gartshore
 F. H. Hopkins & Co.

TRACK EQUIPMENT

F. H. Hopkins & Co.

TROLLEY BASES

Ohio Brass Co.

TROLLEY GUARDS

Ohio Brass Co.

TROLLEY RETRIEVERS

Ohio Brass Co.

TRUCKS, ELECTRIC CAR

Canadian Steel Foundries, Ltd.

TRUSSES, ROOF

Canadian Bridge Co.
 Dominion Bridge Co.

TUBES, BOILER

F. H. Hopkins & Co.

TUBE CLEANERS

F. H. Hopkins & Co.

TURNBUCKLES

Canadian Steel Foundries, Ltd.

TURNTABLES

Canadian Bridge Co.
 Dominion Bridge Co.

UPHOLSTERY, CAR

Du Pont Fabrikoid Co.

VALVES

Canadian Detroit Lubricator Co.
 R. D. Wood & Co.

VALVES, ANGLE AND GLOBE

Ohio Brass Co.

VALVES, BRASS GATE

Ohio Brass Co.

VALVES, LOCOMOTIVE PUP

Taylor & Arnold

VARNISHES

Berry Bros.

VESSELS

Polson Iron Works

WASHERS

Steel Co. of Canada

WASTE

B. J. Coghlin Co.

WATER SOFTENERS & PURI-

FIERS
 Babcock & Wilcox
 Dearborn Chemical Co. of Can.

WELDING

Goldschmidt Thermit Co.

WHEELBARROWS

F. H. Hopkins & Co.

WHEEL GRINDERS

Griffin and Brinkerhoff

WHEELS, CAR

Jas. W. Pyke & Co.

WHITE LEAD

Steel Co. of Canada

WIRE AND WIRE ROPE

Dominion Wire Rope Co.

WIRE, BARE COPPER

Standard Und. Cable Co. of Can.
 Steel Co. of Can.

WIRE, BRASS, IRON AND STEEL

Steel Co. of Canada

WIRE, INSULATED, COPPER

Standard Und. Cable Co. of Can.
 Steel Co. of Canada

WIRE GOODS, BRIGHT

Steel Co. of Canada

WIRE, TELEGRAPH AND TELE-

PHONE
 Standard Und. Cable Co. of Can.
 Steel Co. of Canada

WIRE, TRANSMISSION AND

TROLLEY
 Standard Und. Cable Co. of Can.

WRENCHES, CAST STEEL

Amer. Brake Shoe & Fdry. Co.

YACHTS

Polson Iron Works

J. S. COFFIN
 President

SAMUEL G. ALLEN
 1st Vice-President

W. H. COYLE
 2nd Vice-President

C. L. WINEY
 Sec'y. and Treas.

FRANKLIN RAILWAY SUPPLY COMPANY

Specialists - In Devices That Make for Economy

MAIN OFFICE, 30 CHURCH ST., NEW YORK

CHICAGO OFFICE: 332 South Michigan Avenue.

MONTREAL OFFICE:
 625 Transportation Building.

SAN FRANCISCO OFFICE: 795 Monadnock Bldg.,

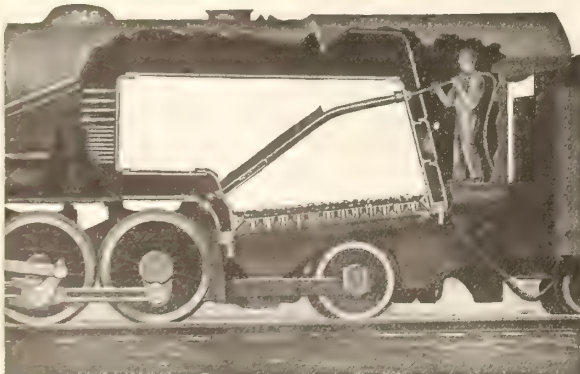
Sessions-Standard
Friction Draft Gear

Alphabetical List of Advertisers

A		Drewry, E. L., Ltd.	71	M	
Algoma Steel Corporation	21	Duner Co.	71	Marconi Wireless Telegraphs	72
American Brake Shoe and Foundry Co.	74	Du Pont Fabrikoid Co.	9	Montreal Locomotive Works	10
Arnold Co.	75			Morrow, John, Screw & Nut Co.	72
Association of Manufacturers of Chilled Car Wheels	7	E		N	
B		Electric Railway Improvement Co.	20	National Steel Car Co.	82
Babcock & Wilcox	80	F		Nicholson File Co.	11
Beatty, M. & Sons, Co.	73	Fairmont Gas Engine & Ry. Motor Car Co.	76	Norton, A. O., Inc.	15
Berry Bros.	12	Flannery Bolt Co.	17	Nova Scotia Steel and Coal Co.	2
Bertram, John & Sons, Co.	—	Franklin Railway Supply Co.	79	O	
Bradstreet Company	74	G		Ohio Brass Co.	11
Brown Hoisting Machinery Co.	3	Galena-Signal Oil Co.	4	Ottawa Car Manufacturing Co.	71
Buffalo Brake Beam Co.	23	Gardner, Jas. T., Inc.	72	P	
Burrows—Acton Burrows, Ltd.	25	Garlock Packing Co.	13	Pedlar People, Ltd.	18
Butterfield & Co.	73	Gartshore, J. J.	71	Piper, The Hiram L., Co.	72
C		General Railway-Signal Co. of Canada.	6	Polson Iron Works	18
Canadian Brakeshoe Co.	75	Goldschmidt Thermit Co.	14	Positive Lock Washer Co.	71
Canadian Bridge So.	78	Grand Trunk Railway	13	Pratt & Whitney Co. of Canada .. 1 and	24
Canadian Bronze, Ltd.	71	Griffin and Brinkerhoff	71	Preston Car and Coach Co.	71
Canadian Consolidated Rubber Co.	26	H		Pyke, J. W. & Co.	22
Canadian Detroit Lubricator Co.	78	Hart-Otis Car Co.	12	R	
Canadian Government Railways	20	Hopkins, F. H. & Co.	8	Rail Joint Co. of Canada	81
Canadian Locomotive Co.	19	Hunt, Robert W., & Co.	75	Railway Materials Co.	78
Canadian National Carbon Co.	21	Hunt-Spiller Mfg. Corporation	74	S	
Canadian Northern Railway	10	I		Safety Car Heating and Lighting Co. ...	16
Canadian Office & School Furniture Co.	71	Imperial Bank of Canada	74	Shipman, Harold C., & Co.	75
Canadian Pacific Railway	19	*Imperial Guar. and Acc. Ins. Co.	78	Sinclair, Angus	75
Canadian Steel Foundries, Ltd.	17	Independent Pneumatic Tool Co.	24	Standard Coupler Co.	79
Canadian Westinghouse Co.	2	International Correspondence Schools ..	73	Standard Underground Cable Co. of Canada	74
Champion Machine & Forging Co.	22	International Malleable Iron Co.	75	Steel Co. of Canada	5
Chicago Car Heating Co.	76	International Nickel Co.	72	T	
Coghlin, B. J., Co.	23	J		Taylor & Arnold	24
Coles, Henry J., Ltd.	71	Jacobs & Davies	75	Terry & Tench Co.	75
Commercial Acetylene Rv. Lt. & Sig. Co.	23	K		Thomson, Ross & Co.	75
Consolidated Car Heating Co.	71	Kinnear Manufacturing Co.	76	V	
Crossen Car Co.	16	L		Van-Hallen & O'Neail	75
D		Lewis, Rice & Son	20	W	
Date, John	71	Locomotive Superheater Co.	22	Wood, R. D. & Co.	75
Dearborn Chemical Co. of Canada	15	Long & Allstatter Co.	14	*Advertisements marked with an asterisk appear in alternate issues.	
Dennis Hotel	72				
Dennison, H. J. S.	75				
Diamond Saw & Stamping Works	25				
Dominion Bridge Co.	26				
Dominion Iron & Steel Co.	21				
Dominion Steel Foundry Co.	78				
Dominion Wire Rope Co.	8				



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes.

LAGONDA ARCH TUBE CLEANERS

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

Other Lagonda Boiler Room Specialties are described in our General Catalogue L-8. Send for Copy.

Babcock and Wilcox, Limited

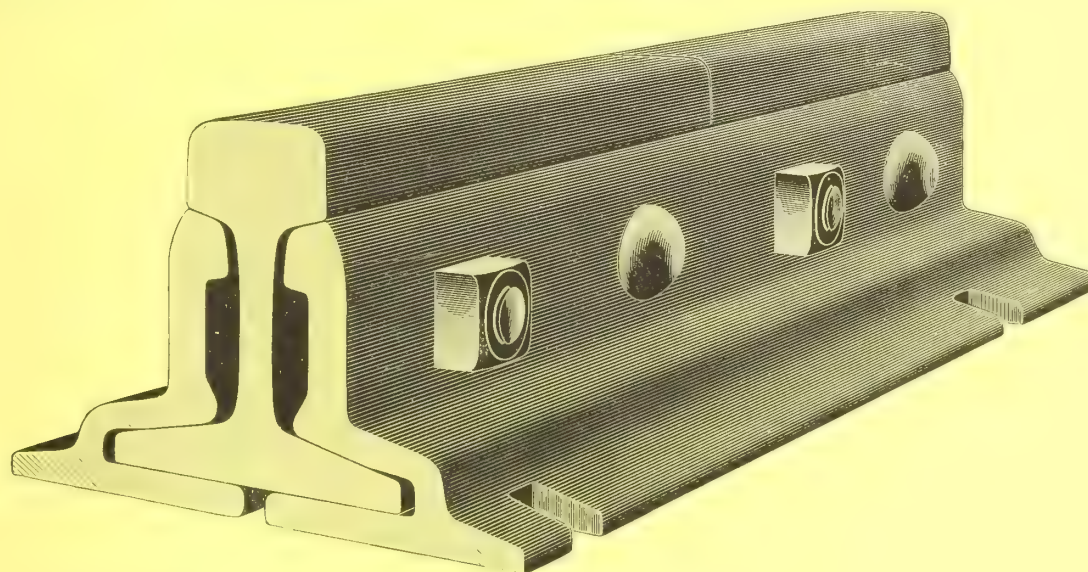
Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Building

The Rail Joint Company of Canada Limited

606 McGill Building,
MONTREAL, P.Q., CANADA

Makers of Base-Supported and One Hundred Per Cent. Rail Joints for Standard, Girder, and Special Rail Sections. Also Joints for Frogs and Switches; Insulated Rail Joints, and Step or Compromise Rail Joints. Patented in Canada and the United States.



CONTINUOUS RAIL JOINT.

THIS COMPANY'S PRODUCT

Is an acknowledged standard, not in an experimental stage; HIGH CARBON STEEL of the best quality used exclusively; Hot-Worked; Oil-Quenched when desired.

See our exhibit at the Panama-Pacific International Exposition, Palace of Transportation, Block 1, East End.

CATALOGUE AND FULL INFORMATION FURNISHED AT ALL SELLING AGENCIES.

Boston, Mass., India Bldg.; Chicago, Ill., Railway Exchange Bldg.; Denver, Colo., Equitable Bldg.; New York City, N.Y., 185 Madison Avenue; Philadelphia, Pa., Pennsylvania Bldg.; Pittsburg, Pa., Oliver Bldg.; Portland, Ore., Wilcox Bldg.; St. Louis, Mo., Commonwealth Trust Bldg.; Troy, N.Y., Burden Avenue.

London, E.C., Eng. 36 New Broad St.



National Motor Trucks

To have designed and built a Truck that has absolutely proven its worth under the most severe tests that any Truck has ever been put through and to demonstrate by results that the Truck is a sound commercial proposition both from the Purchaser's as well as the Maker's standpoint is an achievement worthy of note.

That is the record of the National Motor Truck to-day. It is acknowledged by competent authorities to be not only a marvel of Engineering skill, but a completely satisfactory Truck from a Service and Price basis of comparison.

Backed by a system of Service Stations that guarantees the Purchaser the attention he should get after he has made the purchase, the National Motor Truck will need less attention and repairs and yet give a full service efficiency.

Catalogue mailed upon request.

Put your haulage problems up to men who know how to solve them. Your enquiry entails no obligation.

National Steel Car Company, Limited

Operating Offices and Works: HAMILTON, ONTARIO

LONDON, ENG.

MONTREAL OFFICE, Shaughnessy Bldg.

PARIS, FRANCE

Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 217

TORONTO, CANADA, MARCH, 1916

Subscription Rates, Page 103



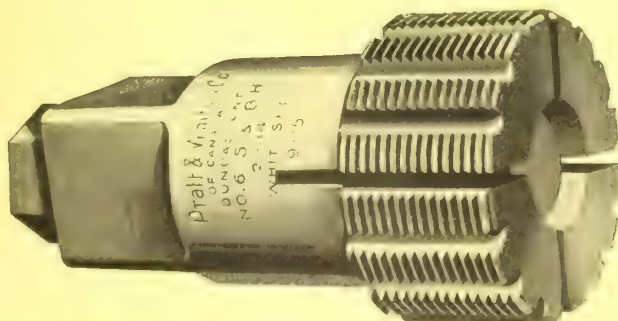
Adjustable Taps for Shell Work

Accuracy is one of the principal requirements demanded in the production of shells.

To maintain it in solid taps is too expensive for modern practice.

The simple adjusting device illustrated on this page gives greatly increased life to your taps and **ACCURACY** at a very reasonable first cost.

We will be glad to tell you about our other lines of adjustable taps which embody



**ACCURACY and
ECONOMY**

Pratt & Whitney Co. of Canada, Limited

DUNDAS, ONTARIO, CANADA

MONTREAL
723 Drummond Bldg.

VANCOUVER
609 Bank of Ottawa Bldg.

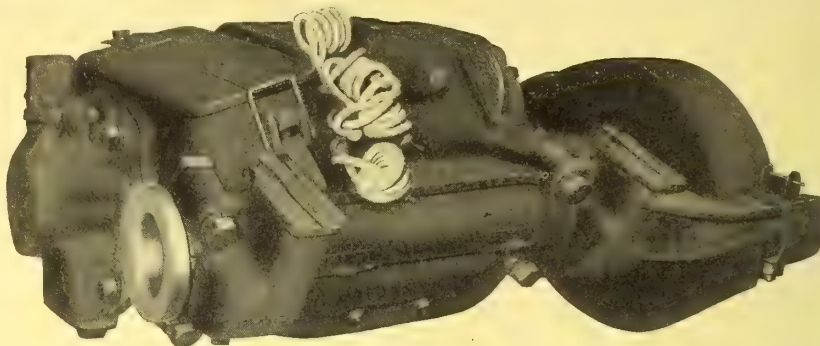
WINNIPEG
1205 McArthur Bldg.

No. 533

Railway Motor

40 H.P. at 500 Volts

50 H.P. at 600 Volts

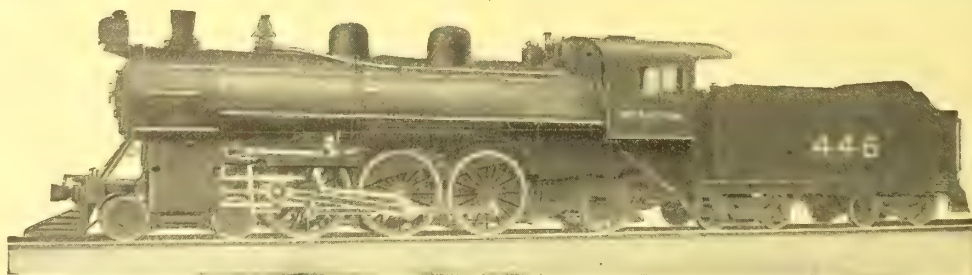


The Westinghouse No. 533 was developed to meet the demand for a standard light-weight, box-frame motor. In addition to all the latest improvements, the ventilated construction increases operating capacity.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

TORONTO, Traders Bank Bldg. MONTREAL, 52 Victoria Sq. OTTAWA, Ahearn & Soper, Ltd. HALIFAX, 105 Hollis St. FT. WILLIAM, Telfer Bldg.
WINNIPEG, 158 Portage Ave. E. CALGARY, Grain Exchange Bldg. EDMONTON, Dominion Bldg. VANCOUVER, Bank of Ottawa Bldg.

Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE—INTERCOLONIAL RAILWAY

Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

Montreal Locomotive Works, Limited

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

Galena-Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office 603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil

in Headlight, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and Correspondence Solicited.

S. A. MEGEATH,
PRESIDENT.

The Steel Company of Canada, Limited

HAMILTON, CANADA

Special Steel Marine Forgings

When forgings are required to stand the strain of rough weather, and to prove themselves reliable and dependable, write us for particulars and prices.

We have the facilities for the production of heavy steel forgings of all kinds, including:

Connecting Rods
Crank Shafts
Eccentric or
Cam Forgings
Marine Engine
Forgings
Piston Heads
Piston Rods
Shafting



Stern Frame of Steamship Hamonic

Rounds
Squares
Rudder Frames
Stern Frames
Side Rods
Steam Engine
Forgings

District Sales Offices:

HAMILTON MONTREAL TORONTO WINNIPEG

W. A. MacLennan, Vancouver, B.C.
J. B. H. Rickaby, Victoria, B.C.

H. G. Rogers, St. John, N.B.
Geo. D. Hatfield, Halifax, N.S.

YOURS FOR GOOD RELIABLE SERVICE

I am the Model 2A Signal

Although my face is the same as other signals, yet my teeth are uncommonly large and have great clearances.

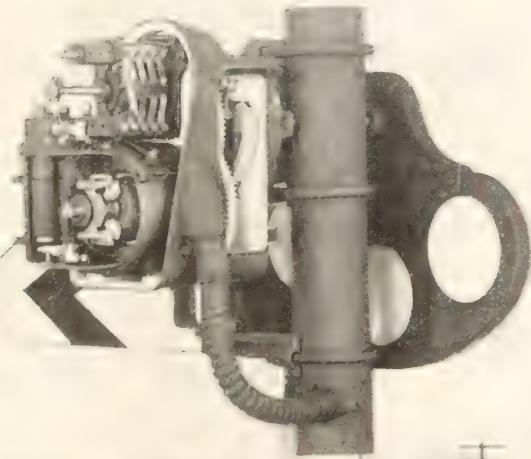
No one can raise my arm for me. It is only I who can do this. Remember that my design is so general that I am able to fill any of your exacting requirements.

Very little effort is required to retain my arm in the vertical position and no complications are required such as are usually employed.

When lowering my arm I am able to bring it back with much ease and to indicate at a considerable distance that I have done so; this is accomplished thru my will power and not thru complications such as are common among my associates.

I am wonderfully rugged and strong; I have stood the extreme heat of the Tropics, the frigidity of the far North, the parching sands of the Desert and the extremely variable climate of the East. I have given unequalled service on 85 railways, although in the prime of life.

Remember that I who have served others satisfactorily can also so serve you. Good Reliable Service is the secret of my success.



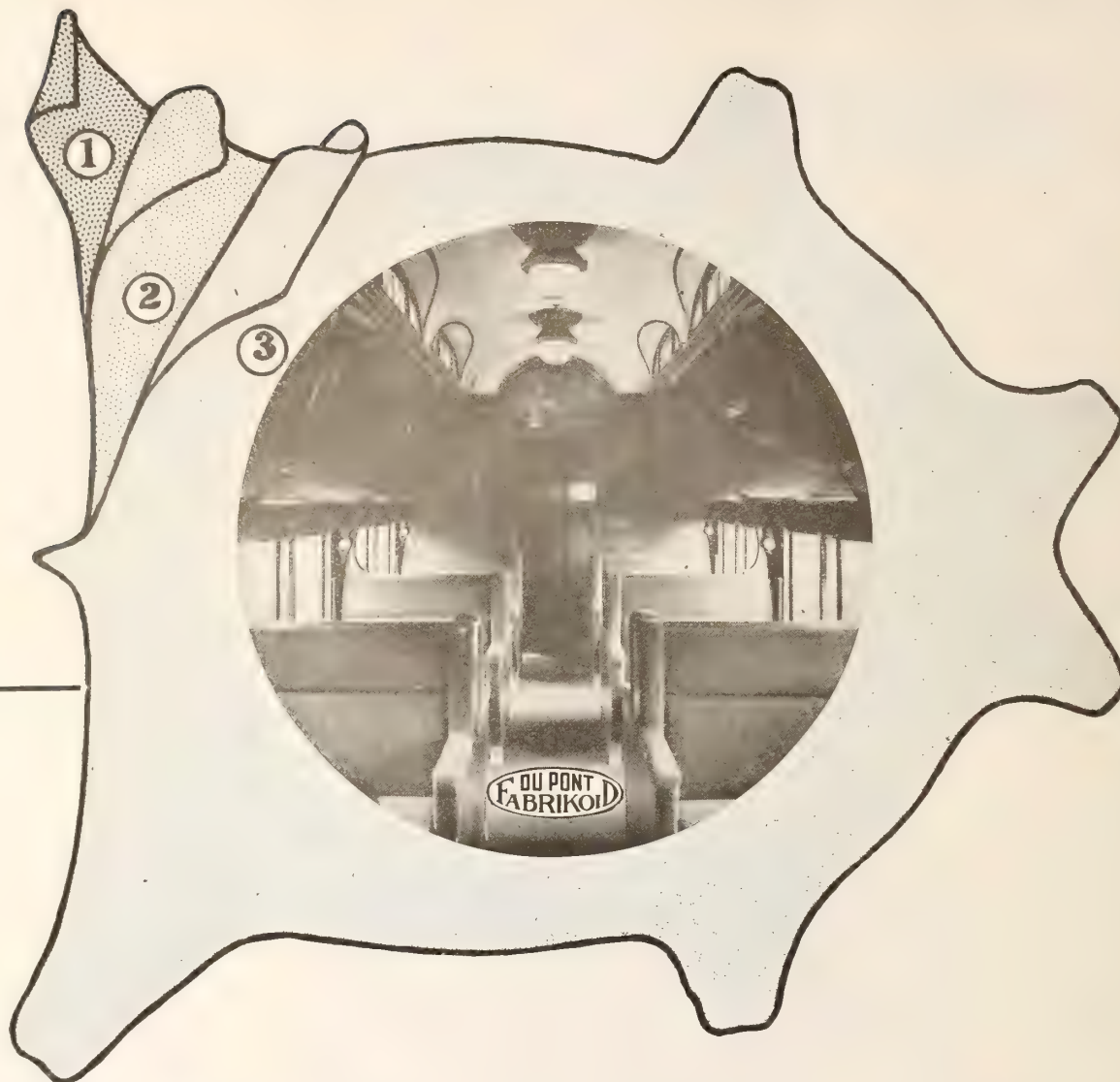
"Safety First"

GENERAL RAILWAY SIGNAL COMPANY
OF CANADA LIMITED



Office and Works, Lachine, Quebec

Branch Office, Winnipeg, Manitoba



Hidden Facts About Hides

The next time a man tells you that he is selling you genuine leather, ask him to explain how many hides has a cow—furthermore, ask him why on the cow—one hide—off the cow—three hides. Ask him the difference between a No.1 leather and split leather; ask him why the split hide is coated and embossed to give it appearance and texture. Then ask him the difference in price and quality of “split” leather and

Use

For
Vestibule Curtains



For
Car Seat Upholstery

Fabrikoid is **not** artificial leather—but is more durable and less expensive than the best coated “splits.” Fabrikoid is a scientifically made upholstery material of the leather type. Its base is a strongly woven fabric; smooth and even; coated, however, like split leather. Unlike the coated split (whose base is a wet, soft, pulpy mass), Fabrikoid has tensile strength—can be washed and is guaranteed for one year not to peel or crack. Costs less than coated splits and stands up under severe service conditions. Made in many artistic patterns. Samples and detailed information on request.

Du Pont Fabrikoid Company

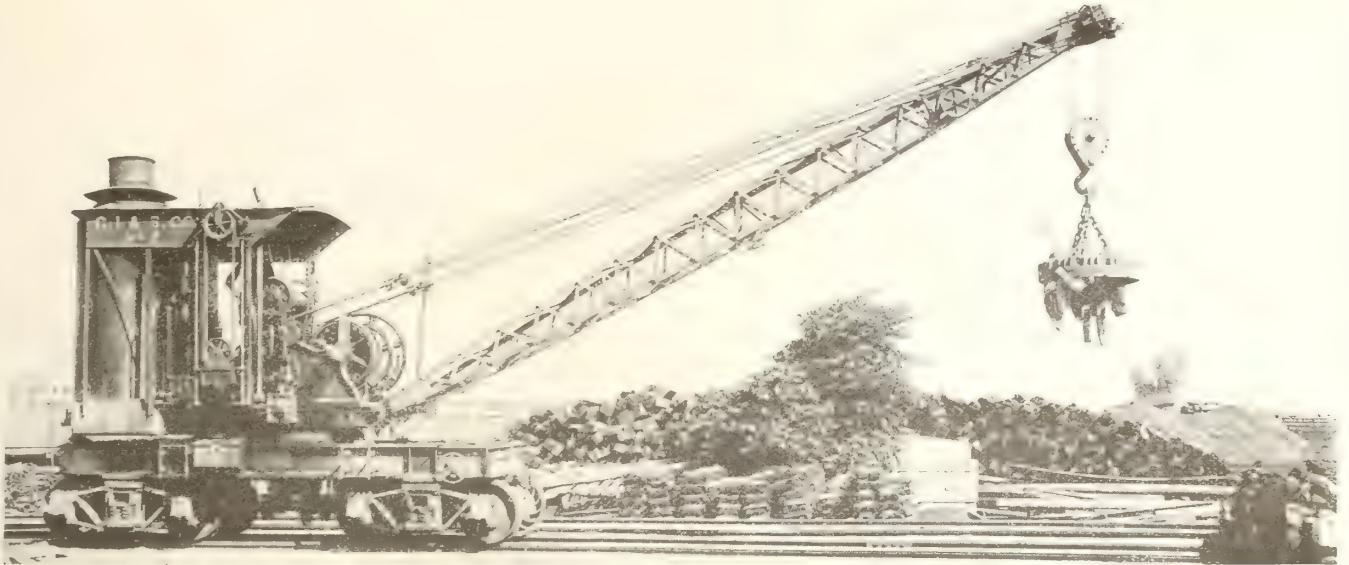
Canadian Office and Factory, Toronto, Canada

Du Pont Building, Wilmington, Delaware

WENDELL & MacDUFFIE CO.

R. R. Department Representatives

63 Broadway, New York, N. Y.



Why employ 20 to 40 men to handle your material? A

BROWNHOIST Locomotive Crane

will do the same amount of work with a decided saving to you. Its cost, including 6 p.c. interest on investment, depreciation, and operating costs, is only \$6.00 to \$10.00 per day. It is one man operated, powerful, quick-acting, and built to withstand hard and continuous service. Records prove this.

Adaptability. The equipment is interchangeable. It only takes a short time to apply the Grab Bucket, Bottom Block, Drag-Line Bucket, Pile Driving Attachment, Lifting Magnet, or Shovel Equipment. This makes practically six machines in one.

Railroads all over the country are realizing more and more the advantage and economy of having a Brownhoist Locomotive Crane on the job, because it is always ready to work in case of emergency. A Brownhoist Crane can be relied upon. One road uses thirty of them.

*INVESTIGATE TO-DAY. Catalogue I shows how
and where some of these cranes are used.*

The Brown Hoisting Machinery Co.

CLEVELAND, OHIO

MONTREAL OFFICE, 145 St. James Street



When You Want Dependable Wire
Rope For Any Service Try

"DOMINION"

We recommend it without fear, because we know
the satisfaction it has been giving for years.

Let us quote you for

SHELL BOX HANDLES

The Dominion Wire Rope Company, Limited, Montreal
St. Catharines and Winnipeg

Railway and Contractors'
Equipment
of all descriptions



"H & E" Ball and Cone Bearing
LIFTING JACKS



"Industrial Works" Locomotive, Coaling and Wrecking Cranes.

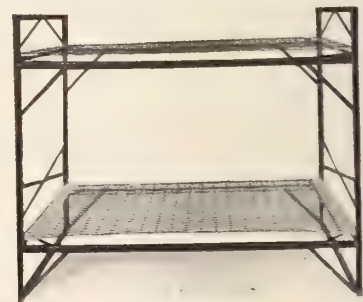


"MARION"

Steam and Elec-
tric SHOVELS
of all sizes.

RAILROAD
DITCHERS,

DRAGLINE
EXCAVATORS,
Etc.



"Tiger" Steel Bunks

especially designed for RAIL-
ROAD AND CONTRAC-
TORS' WORK and Logging
Camps.

Branch:

St. Catharines, Ont.

F. H. Hopkins & Co

Head Office:

MONTREAL



Gas-Weld Bonding Process

Offers an easy means of installing permanent low resistance bonds on ball of rail without drilling.

Entire apparatus is low in cost and is compactly arranged for moving along track.

Send for Booklet "Gas-Weld Bonding"

The Ohio Brass Company
Mansfield, Ohio

General Service Cars

Otis Dump Cars

—PATENTED—

—PAMPHLET No. 16 TELLS ABOUT THEM

Always Ready For
Use

One Man
Operation

Simplest, Safest
and Best Door
Operating Gear

Largest
Unobstructed
Door Opening

Dumps Clear of
the Rail



Built in Any Size
or Capacity

All Steel, Wood
or Composite

For Standard or
Special Service

Thousands in Use

THE STANDARD ORE CAR

THE MOST PRACTICAL CAR FOR ALL BULK FREIGHT.
A DUMPING GONDOLA FOR ALL SERVICES.

DESIGNED AND BUILT BY

THE HART-OTIS CAR CO., LIMITED : Montreal

—SOLE PATENTEES FOR GENERAL SERVICE CARS FOR CANADA—

New Route to the West

Between

TORONTO AND VANCOUVER

By

Canadian Northern Railway

Via

Port Arthur, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Prince Albert, North Battleford, Calgary, Edmonton, Kamloops, New Westminster, Vancouver, Victoria, and All Western Points.

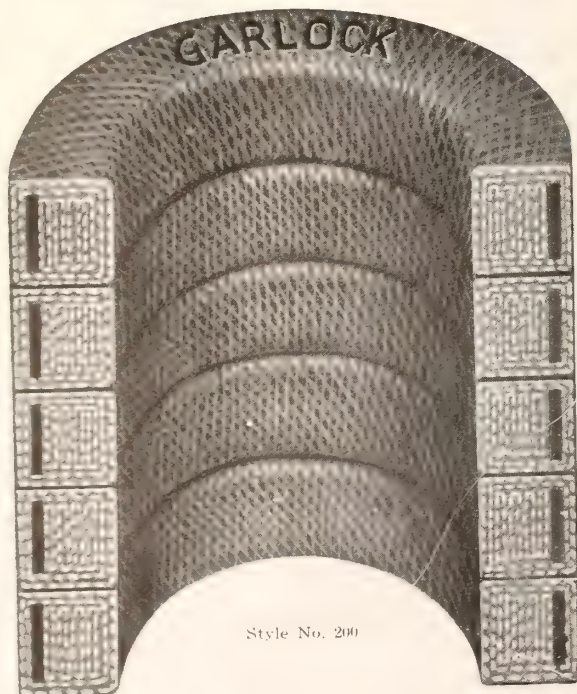
Leave Toronto 10.45 P.M.
Mon., Wed., Fri.



Connections to and from
all points.

Electric Lighted Sleepers, Dining Cars and First-Class Coaches.

For full particulars, through tickets to all points and Berth reservations, apply or write to R. L. FAIRBAIRN,
General Passenger Agent, 68 King St. E., Toronto, Ont.



Style No. 200

Garlock High Pressure Piston Rod Packing

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.

THE GARLOCK PACKING COMPANY

-

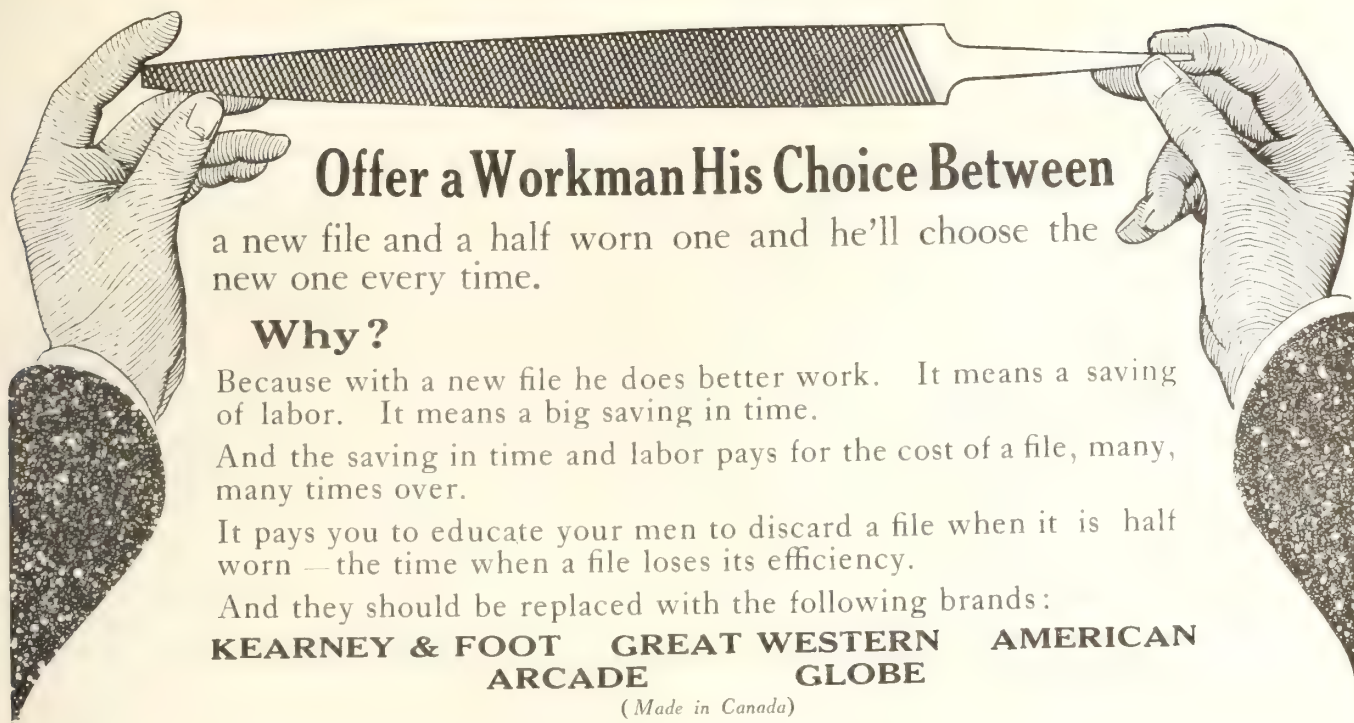
Hamilton, Ontario



Branches :

Montreal, Que., 342 St. James St. East Toronto, Ont., Continental Life Bldg.
Winnipeg, Man., Galt Building





Offer a Workman His Choice Between

a new file and a half worn one and he'll choose the new one every time.

Why?

Because with a new file he does better work. It means a saving of labor. It means a big saving in time.

And the saving in time and labor pays for the cost of a file, many, many times over.

It pays you to educate your men to discard a file when it is half worn — the time when a file loses its efficiency.

And they should be replaced with the following brands:

KEARNEY & FOOT GREAT WESTERN AMERICAN
ARCADE GLOBE

(Made in Canada)

They are the products of plants with an output of 60,000,000 files yearly.

They are used by 90 p.c. of the file users in Canada. Made by a firm with 50 years' experience in the making of efficient files.

Nicholson File Company

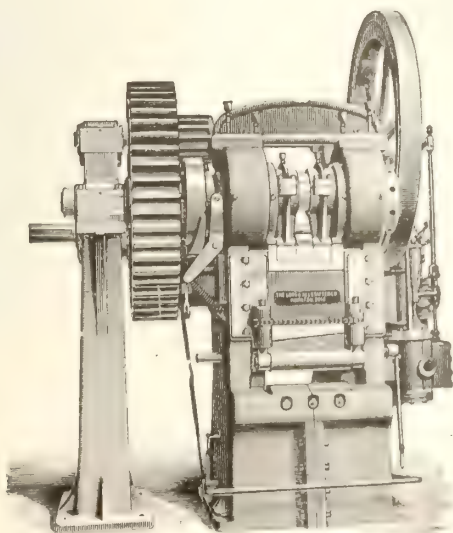
Port Hope

(Dealers Everywhere)

Ontario

A FREE copy of "File Philosophy" will be sent you on receipt of a card.

Power Punching and Shearing Machinery



Gate Shear---Steam-Driven

Over 350 sizes and styles for all kinds of light and heavy work designed and manufactured by

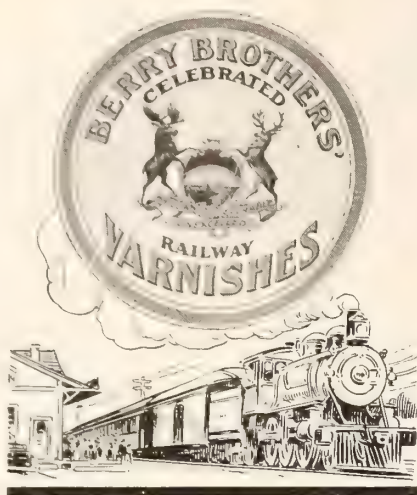
The Long & Allstatter Co.

Hamilton, Ohio, U. S. A.

Riveting Machines Tire Welding Machines
Armature Disc Notching Machines
Tire Bending Rolls Beam Coping Machines
Bending and Forming Machines

Write for Catalogue if interested.

Correspondence invited.



Berry Brothers' Railway Varnishes

Represent Nearly 60 Years of Varnish Making Experience

Berry Brothers' extensive line of Railway Varnishes makes it possible for you to purchase the right varnish for any demand.

Here are a few finishes you should know.

Locomotive Black

A fossil gum varnish of the highest grade--- for the best attainable finish on locomotives, tenders and valuable rolling stock, combines excellence with durability--- efficient because its use is true economy--- a case of the best being the cheapest.

Front End Black

For the front end of locomotives. It covers well, makes a handsome jet black finish, and stands a high degree of heat without injury.

Smoke Stack Black

Made especially for use on smoke stacks, producing a jet black and brilliant lustre, and resisting heat of a high degree without injury.

Let us send you a copy of our Railway Varnish catalog, just issued

WALKERVILLE

BERRY BROTHERS
(INCORPORATED)
World's Largest Varnish Makers

ONTARIO



Don't Pump Your Jack Down

Lower the Load by "Pressing the Button"

The Norton Self Lowering Jack

is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

Send for Illustrated Catalogue No. 28.

A. O. Norton, Limited
Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents:
MUSSENS LIMITED

Montreal Toronto Winnipeg Cobalt Calgary
Vancouver



Grand Trunk Hotels

The Chateau Laurier, Ottawa, Ont.

Accommodation 350 Rooms. Rates \$2.00 per day and upwards. European Plan.

The Fort Garry, Winnipeg, Man.

Accommodation 300 Rooms. Rates \$2.00 per day and upwards. European Plan.

The Macdonald, Edmonton, Alta.

Accommodation 250 Rooms. Rates \$2.00 per day and upwards. European Plan.

Hotels under construction—

The Qu' Appelle, Regina.

The Prince Rupert, Prince Rupert.

The Double Track Route

Provides

Service	Comfort
Safety	Courtesy
Speed	Convenience

Winter Tours to California and all Pacific Coast Points. Florida, Texas, New Orleans, Etc.

Winter Tours Tickets now on sale. Stop over privilege allowed.

The New Way West

Via the Transcontinental and Grand Trunk Pacific Railway affords new scenery, new interests. Write to any Agent of the Company for advertising matter, rates, and all particulars.

G. T. BELL,
Passenger Traffic Manager, Montreal

W. S. COOKSON,
General Passenger Agent, Montreal



Pintsch Mantle Light

No other system of car lighting gives clean, safe and efficient light without intricate mechanism, subject to defects and failures. Pintsch Mantle Light is the only absolutely dependable method of lighting railway cars.

The Safety Car Heating and Lighting Company

2 Rector Street, New York

718 Transportation Building, Montreal

465 Railroad Shops in the United States and Canada Use the Thermit Welding Process



Let us send you this pamphlet.

This comprises practically all the shops of importance in North America, and it can be said without exaggeration that the list of railroads using Thermit includes practically every system from the small road having only three or four locomotives to the largest system in the world having many thousand locomotives.

If by any chance your shop is not using Thermit, you should investigate the process and see how effectively and economically it will handle the many repairs on locomotive frames and other sections.

Remember that the greatest railway systems in the world use hundreds of thousands of pounds of Thermit. They do not use it for any reason except that it "delivers the goods" and has proven itself a profitable investment.

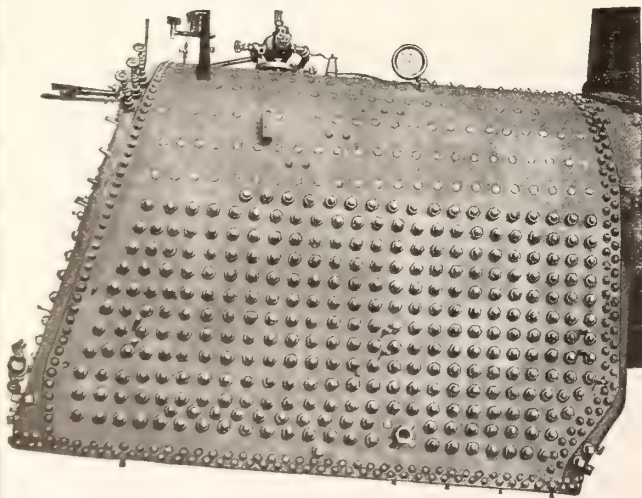
Let us mail you our new pamphlet, No. 2144, which contains full information on the use of Thermit in Railroad Shops.

We have a well equipped shop in Toronto, Ont., for the manufacture of Thermit and appliances used with it.

Goldschmidt Thermit Company

103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco 7300 So. Chicago Ave., Chicago
90 West Street, New York



The Perfect Stay

For Locomotive Fire Boxes

Tate Flexible Staybolts

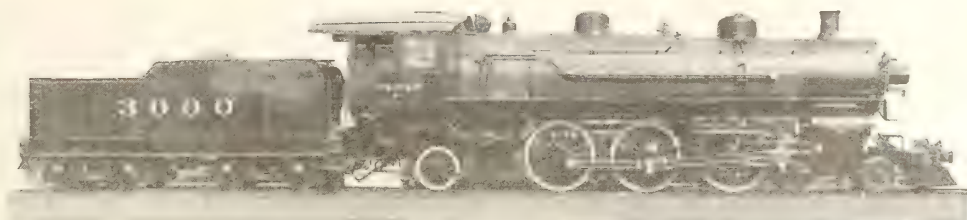
Are now in use on 425 Railroads of the United States as well as the main Railroad Systems of Canada.

Recognized as the Most Economic Flexible Staybolt now in the market, because the Tate Bolt has demonstrated its true functions as a mechanical appliance to service fire box requirements.

Many Railroad Systems have kept accurate service records and show remarkable increase in the earning power of the locomotives that have been equipped with complete installations of the Tate Flexible Staybolt.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.



Scientific Treatment of Boiler Waters Dearborn Service to Railroads

Every time an engine failure takes place it means a large expense in dollars to the railroad company in time lost, impairment of service, and cost to send another engine to the rescue. Every time a locomotive goes to shop for repairs, it represents many thousands of dollars invested capital which is earning no revenue.

By the use of Dearborn Treatment engine failures due to the boiler foaming or leaking can be entirely eliminated. Dearborn Treatment counteracts the foaming tendency in waters of that type, and prevents scale formation, and the corrosive and pitting action that results in leaks. By thus overcoming the bad effects of the waters used, and keeping the boiler tubes and sheets free from

incrustation, the engine may be kept in service longer between boiler washings, and the period between shop-pings for repairs of this character will be much longer. There are also great savings in fuel and lubricating oil, and the engine will always be in condition to haul full tonnage.

Dearborn Chemical Company of Canada, Limited

Office and Works : 1220-1230 Dundas Street, Toronto, Canada

Avoid the Waste of Constant Repairs

No road can earn big dividends with constant repair and replacement eating into its profits.



Pedlar's ^{"PERFECT"} Culverts

make a definite saving in repair expense. Outlive under ordinary usage the most carefully laid roads.

The first cost delivered at your station is practically the last cost. The culvert arrives assembled complete ready to be rolled into the trench. No excessive transportation problems.

Made from anti-corrosive  that cannot crack or rust or corrode.

Easy to Haul — Easy to Instal

Made in sizes and lengths to suit any road requirements.

The complete Culvert Reference Book No. 4 R.M. brings you much important data and valuable drainage tables. Shall we send it to you by next mail?

Address Nearest Branch.

THE PEDLAR PEOPLE, Limited

(ESTABLISHED 1861)

Executive Office and Factories, Oshawa, Ont.

Branches : Montreal Ottawa Toronto London Winnipeg

Modern High-Class
ROLLING STOCK



Passenger, Freight
and
Electric Railway
Car Castings,
Forgings
and Repair Parts.

Crossen Car Company, Limited
Cobourg - Ontario

Canadian Pacific

For WINNIPEG and VANCOUVER

Leave TORONTO 6.40 P.M. Daily
Via the TRANSCANADA

Through equipment including Electric Lighted
Compartment Observation Car, Standard
and Tourist Sleepers, Dining Car,
First-class Coaches.

"The frequent C. P. R. Service passing through the Business
Centre of each City is an asset to the Traveller."

Particulars from Canadian Pacific Ticket Agent, or write, W. B. Howard,
D. P. A., Toronto

CANADIAN STEEL FOUNDRIES LIMITED

STEEL CASTINGS - MANGANESE STEEL CASTINGS
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK
BAR STEEL

GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
BRANCH OFFICE — TORONTO

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL

Nova Scotia Steel and Coal Co., Limited

Manufacturers of

MARINE, RAILWAY AND GENERAL ENGINEERING FORGINGS OF ALL SHAPES AND UP TO 40 TONS IN WEIGHT, MADE FROM BEST ORDINARY OR HARMET FLUID COMPRESSED OPEN-HEARTH STEEL. OUR FORGE IS EQUIPPED WITH THE MOST MODERN STEAM HYDRAULIC PRESSES.

RAILWAY TRACK MATERIAL, fish plate, tie plate, track bolts, spikes, tee rails—12 to 40 lbs. per yard.

ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

ALSO MINERS AND SHIPPERS OF THE CELEBRATED "OLD SYDNEY" COAL.
HIGH CALORIFIC VALUE—LOW ASH—UNEXCELLED FOR STEAM-RAISING PURPOSES.
BEST HOUSE COAL MINED IN CANADA.

Collieries, Iron and Steel
Furnaces:
SYDNEY MINES, C.B.

Coal Shipping
Piers:
NORTH SYDNEY, C.B.

Finishing Mills, Forge, and
Engineering Shops:
NEW GLASGOW, N.S.

INQUIRIES SOLICITED

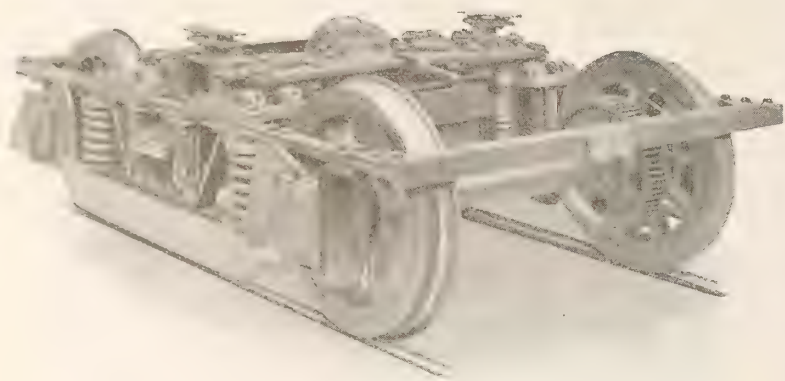
Western Steel Sales Office:
Room 14, Windsor Hotel,
Montreal, Que.

Western Coal Sales Office:
219, Board of Trade Bldg.,
Montreal, Que.

Head Office:
New Glasgow, N. S.

Canadian Baldwin Electric Trucks

Interurban Service



Canadian Baldwin Trucks, Class 84-30-AA, built for Lake Erie and Northern Railway, Ontario.

The truck illustrated is designed for high speed on electric railways, and has a rated carrying capacity of 30,000 pounds on the centre plate.

It has frictional side bearings and is of the equalized pedestal type.

Canadian Baldwin trucks, solve the problem of minimum weight, economical maintenance, simple construction, noiseless operation and easy riding.

There is comfort in riding on roads where Canadian Baldwin Trucks are used.

Manufactured in Canada by

Canadian Locomotive Company, Limited
KINGSTON, ONTARIO

STEEL SHIPBUILDERS

Engineers and Boilermakers



Steel Tug "Fredericton" built for the Dominion Government, 80 feet length, 20 feet breadth, 10 feet draught, compound marine engine, 12 x 26 x 18, clyde boiler 10 feet x 11 feet, 145 lbs. steam.

Dredges, Hydraulic and Dipper Type; Steel Steamers, full Canal Size; Tugs, Barges and Scows.

Marine Engines and Boilers, all Sizes

Polson Iron Works, Limited
Works and Office, Esplanade East, Toronto

SUCCESSFUL and PROSPEROUS



The figures contained in the Thirty-fifth Annual Report of the North American Life indicate a year of increased success.

The growing records of business in every department made still greater increases during the past year.

Policies in Force now amount to over \$56,200,000.

The Assets amount to \$15,716,888.

The Net Surplus now exceeds \$2,500,000.

NORTH AMERICAN LIFE ASSURANCE CO.

Outstanding Figures for 1915.

Increase over 1914.

Policies Applied For	\$9,745,944	\$1,391,878
Policies Issued	9,102,128	1,248,078
Assets	15,716,888	800,880
Net Surplus	2,502,093	385,928
Cash Income	2,749,950	85,933
Payments to Policyholders ..	1,386,025	45,936

PROFITS PAID TO POLICYHOLDERS

The Company has paid out in the last ten years over \$1,500,000 to Policyholders as Profits, and has contingently apportioned for 1916, the sum of \$292,821.26.

Such uniform progress is the outward evidence of the splendid position attained by the Company, and of the sure foundation upon which it has been built.

Preponderantly, a Policyholder's Company embodying the essential features of Mutuality, its record touching investments, interest earnings, favorable mortality and all other points incident to a highly skillful and conservative management, makes the North American Life an ideal Company in which to insure.

North American Life Assurance Co.

"Solid as the Continent"

L. GOLDMAN,

First Vice-President and
Managing Director.

EDWARD GURNEY,

President.



A Clear Track To Promotion

How to get off the side track—how to break the couplings that hold them near the bottom of the pay roll—is the one big problem that troubles most railroaders.

There's a clear track to promotion—without grade or curve—open to the man that has the backbone and grit to take it. Before you can travel this track to promotion and bigger pay you must "coal up" with knowledge—you must be specially trained.

The Railway Instruction Department of the International Correspondence Schools is able and ready to give you the training you must have. You can get it right at home without losing an hour's time from your present job.

It will not cost anything to find out how the I.C.S. can train you for a better job. Put an "X" near the class of work you would like to follow, in the attached coupon, and mail it to the I.C.S. This won't obligate you in the least. It will simply bring full information by return mail.

Mark the Coupon NOW

International Correspondence Schools Box 8402, Scranton, Pa.

Please explain, with a suggestion to me, how I can qualify for the position I have marked with an X.

Locomotive Engineer	Marine Engineer
Air-Brake Inspector	Chief Navigator
Air Brake Repairman	License Navigator
R. R. Shop Foreman	Coastwise Navigation
R. R. Traveling Engineer	Electrical Engineer
R. R. Traveling Fireman	Electric Car Running
R. R. Construction Eng.	Electric Railways
R. R. Accounting	Heavy Electrical Engineering
Bookkeeper	Tel. and Tel. Engineer
Surveyor	Machine Designing

Name _____

St. and No. _____

City _____

Present Occupation _____

Employed by _____

FOR TICKET CASES AND COMMERCIAL FURNITURE

of all descriptions to stock
or special design, apply to

The Canadian Office and School Furniture Co.,
Limited

Preston - Ontario

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Celebrated Wheel Truing Brake Shoe.
Best Wheel Grinders in the World.

For Safety's Sake Specify -

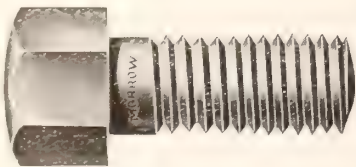


Northern Electric "R. S. A." Wire

- ☐ Buying wire for railway signalling purposes on a price basis is a crime.
- ☐ Climatic conditions, especially in Canada, seriously affect the wire connecting the signals. Extremes of heat and cold, gases, acids, and oils are some of the many elements, that railway signal wire is subjected to and must combat.
- ☐ Northern Electric Railway Signal Wire stands the tests of time. It not only meets but exceeds the "R.S.A." Specifications. It is backed by the largest makers of wires and cables in the country, and sells on a quality instead of a price basis.

Northern Electric Company LIMITED

MONTREAL HALIFAX TORONTO WINNIPEG REGINA CALGARY VANCOUVER



If you want the best Set and Cap
Screws made, insist on having
"MORROW'S"

John Morrow Screw & Nut Company,
Limited.
INGERSOLL - - ONTARIO

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. BABBITTS. Miscellaneous Brass Castings for Railroads.
Works and Office: 69 Delorimier Avenue, MONTREAL, QUE.

ENAMELED IRON SIGNS

The ideal signs for
Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.

We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc,

Guaranteed not to
fade or be affected
by the weather in
any way.

Acton Burrows
Limited

Enameled Iron Signs

70 Bond Street - Toronto

Proper Brush Selection Increases Motor Efficiency

There is one grade of brush that is best suited to each condition of motor operation.

Choose this proper grade and the motor will operate most efficiently.

A grade not properly selected will not only cause pitting and wearing of the commutator but may reduce the efficiency of the motor quite appreciably.

In our twenty-six years of experience in the manufacture of brushes we have developed a grade that is best suited for every condition of stationary or railway motor operation.

More than that, we have a staff of expert engineers who are at your service and who will make proper recommendations.

If you have a brush problem put it up to our engineers. They will gladly advise you.

Write for a brush data sheet.

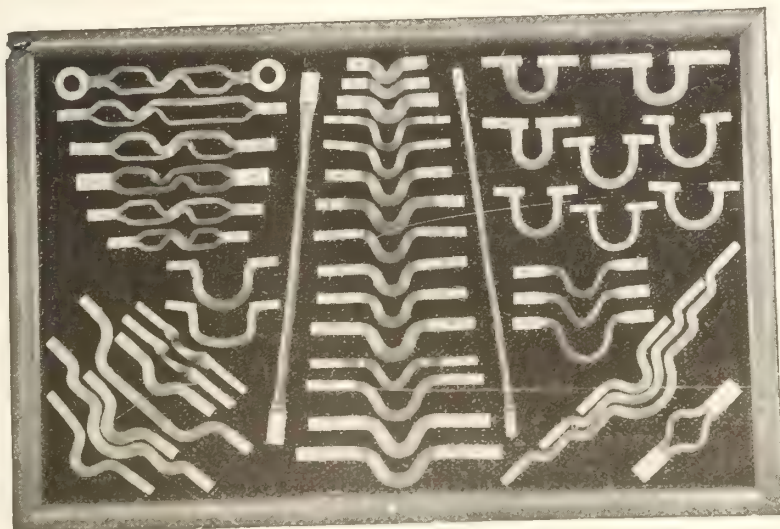
Canadian National Carbon Co., Limited

99 Paton Road, Toronto, Ont.

Our Trade-Mark



*See that your brushes
bear this stamp.*



Electric Weld Rail Bonds

meet every condition.

Neither do they corrode
at the terminals.

**The Electric Railway
Improvement Co.**

Cleveland, Ohio

Dominion Iron & Steel Co., Limited

Manufacturers of

Basic Open Hearth Steel Rails

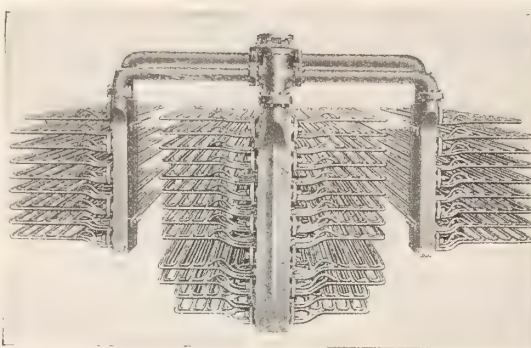
We will be pleased to have your enquiries for 1916 shipments

**Head Offices
and Works**

Sydney, Cape Breton, Canada

Fire Tube Marine Superheater -- Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler h.p. from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, New York, N.Y.

Peoples Gas Bldg., Chicago, Ill.

Algoma Steel Corporation, Limited

Manufacturers of

Steel Rails, Splice Bars, Tie Plates, Forging Billets, etc.

We would be pleased to have your enquiries for 1916 deliveries.

Works and Sales Department: Sault Ste. Marie, Ontario, Canada

Drop Forgings

Made in the Champion Way

Also Steam Hammer and Heading Machine Forgings

Let us have your Blue Prints

The Champion Machine & Forging Company

CLEVELAND, OHIO

New York Office:
30 Church St.

Philadelphia Office:
Bourse Building.

Detroit Office:
H. B. Kendal, 56 Cadillac Sq.

Chicago Office:
1623 Monadnock Block.



Driving Spring, Loose Ends and Slots.

Railway Springs

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.
EQUALIZING, DRAWBAR, BUFFER AND SPIRAL SPRINGS of all kinds.
STREET RAILWAY SPRINGS, from the largest to the smallest.
TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE
SANDERS, CHAIN, Etc.

Manufactured by

B. J. Coghlin Company, Limited
Montreal, Canada

Jas. W. Pyke & Company, Limited

Iron, Steel and Metal Merchants

Locomotive, Driving, Engine and Tender Truck Axles, Passenger, Freight, and
Electric Tram Car Axles—To Standard or Railway's own Specification.
Staybolt and Engine Bolt Iron—Quality and Service Unexcelled.
Steel Plates—Firebox, Flange and Tank Qualities.
Structural Shapes—Beams, Channels, Angles, Tees, Zees, etc.
Steel Billets and Forgings—of all descriptions.
Locomotive Boiler and Superheater Tubes—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
232 St. James Street,

Montreal

The Light of Day on the Right of Way

Headlights

Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

Car Lighting

Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency with economy. Standard cylinder supplies from one to two months' lighting of the average car.

Signals

Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

Commercial Acetylene Railway Light and Signal Company
103 BAY STREET, TORONTO

Main Office, 80 Broadway, New York

Branches, Atlanta, Boston, Chicago, San Francisco

American Flexible Staybolts

Manufactured in Montreal



Made of the best standard staybolt iron, adding flexibility by process of making as shown above---closely approximating a rope structure.

Write for booklet on subject.

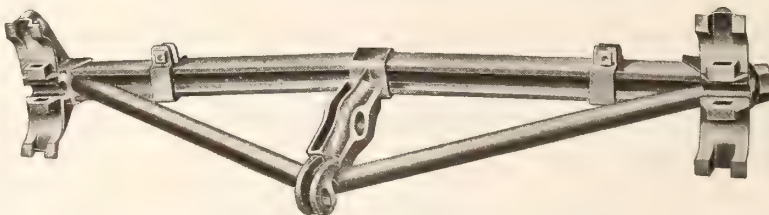
TAYLOR & ARNOLD, Limited
MONTREAL WINNIPEG

Buffalo Brake Beam Company

BUFFALO BEAMS ARE BEST BEAMS

Offices:

NEW YORK
30 Pine Street
ST. LOUIS
Syndicate Trust Bldg.
MONTREAL
195 Commissioner St.



Works:
BUFFALO,
N.Y.

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment



Money paid for these Brake Shoes was largely money wasted

Why?

Because these unreinforced brake shoes did not give equivalent service for their cost, having broken in service before their life had barely commenced.

And the remedy?

Use only Reinforced Brake Shoes—then you will get your brake shoe money's worth in long and safe service.

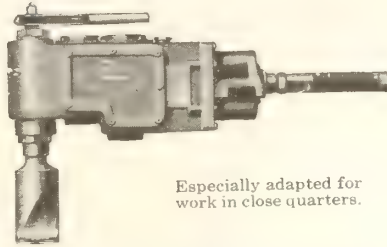
Manufactured in Canada.

Dominion Brake Shoe Company, Limited

2152 2152 The HOLDEN CO., Limited, Agents,
350-356 St. James Street, MONTREAL

Thor

Most Convenient Air Tool Made Close Corner Drill



The neat and compact construction, together with the design of the mechanical parts, makes it possible to drill holes in places where it would be absolutely impossible with an ordinary centre spindle drill.

Especially adapted for work in close quarters.

Made in Two Sizes:
No. 8 For Drilling up to 1 1/4 in.
No. 9 For Drilling up to 3 in.

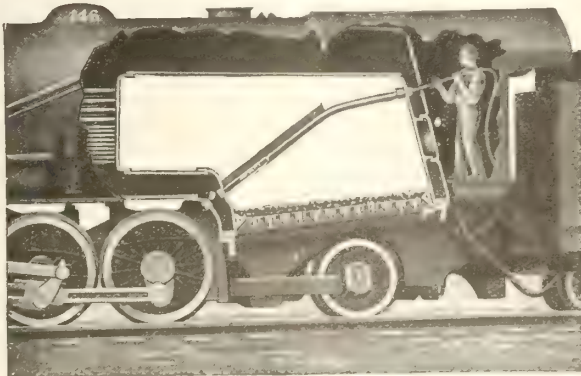
Every experienced mechanic appreciates the value of a Thor Close Corner Drill for steady service and economy. Order one on trial to-day. We take all the risk.

Independent Pneumatic Tool Company

334 St. James St., Montreal, Que.



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes.

Lagonda Arch Tube Cleaners

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

Other Lagonda Boiler Room Specialties are described in our General Catalogue L-8. Send for Copy.

Babcock and Wilcox, Limited

Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Building

Linking Prairie With Ocean

Winnipeg Cochrane Quebec
Montreal St. John Halifax
Charlottetown The Sydneys

Canadian Government Railways

Operate Over 4,000 Miles of Railway

Transcontinental Ry., Intercolonial Ry., Prince Edward Island Ry., St. John and Quebec Ry.

Montreal and Halifax—Ocean Limited, Daily except Saturday,—Maritime Express, Daily—Connection for St. John, Prince Edward Island, Newfoundland except Sunday.

**THROUGH
EXPRESSES**

Toronto and Winnipeg—The National (tri-weekly service)—A NEW train via a NEW route through a NEW country.

F. P. Gutelius, General Manager.

C. A. Hayes, General Traffic Manager.

H. H. Melanson, General Passenger Agent.

Head Offices: MONCTON, N.B.



28 "Service" Branches Throughout Canada

Canadian Consolidated
Rubber Co., Limited

Montreal, P. Q.



It Always Pays to Buy the Best

Just as it pays to plant the best seed, so
it always pays to buy the best goods.

Best Quality
Best Construction
Best Workmanship

In our Rubber Goods, it is QUALITY that counts.
We stand back of the quality, workmanship and construction of our lines. That protects your interests, and you are sure to be satisfied.

Our line-up is complete, our quality is unexcelled, and our prices are right. Let us show you what we can do.

It is Our Desire to Serve You



Canadian Consolidated
Rubber Co., Limited

Montreal, P. Q.

28 "Service" Branches Throughout Canada



Canadian Railway and Marine World

March, 1916.

Passenger Cars for Transcontinental Service on Canadian Northern Railway.

For the inauguration of transcontinental train service on the Canadian Northern, it was found advisable to provide 77 new cars of the latest and most substantial construction, the various types being illustrated by the accompanying plans and divided as follows: 15 baggage-express, 4 postal, 5 second class, 12 first class, 7 colonist sleeping, 7 tourist sleeping, 7 dining, 11 standard sleeping, 2 compartment sleeping and 7 compartment-buffet observation sleeping, all of which were built from the railway company's designs and specifications by the following builders: National Steel Car Co., Hamilton, Ont., Crossen Car Co., Cobourg, Ont., Preston Car and Coach Co., Preston, Ont., and Canadian Car and Foundry Co., at its Amherst, N. S. and Turcot, Que. works.

The body framing throughout is of ample proportions to withstand an assumed buffing shock of 500,000 lbs. with a large factor for safety, the side construction is selfsupporting and thoroughly reinforced for window and side door openings. The two body bolsters are of unit builtup form, having suitable cover plates top and bottom, 24 in. wide at the centre, tapering to 15 in. in width at the ends. The centre sills form a box girder with cover plates 23 in. in width, extending from end to end of cars, so far as possible, the principal members being two rolled steel 15 in. by 33 lb. channels placed back to back and provided with a finished camber at the centre of car of $\frac{1}{4}$ in. when car is ready for service. The vestibules are built entirely of steel, so formed as to constitute separate members each side of centre construction, this being an important item in case of damage admitting of making repairs more easily and also should one corner be swept away there is no liability to distort or disarrange the adjacent end panel on other side of car. The platform buffers are of coil spring design with coupler centring device, furnished by the Standard Coupler Company, of New York, which provides a maximum cushioning effect of 84,000 lbs. per car, which added to that of the A-2-P draft gear allows for a maximum buffing resistance of 387,000 lbs. before the centre construction is directly effected. The top diaphragm buffing attachment is designed to accommodate the railway company's standard coil springs of $\frac{1}{4}$ in. square crucible steel. The steel end posts extend down in front of the pressed steel end sills and are reinforced by cover plates and connection angles, all forming a rigid panel strong enough to cause the side and centre construction to work in union under direct impact.

General conditions both from the standpoint of maintenance and operation necessitated the use of a steel car insulated inside and outside with wood. The light weight of the cars has been kept down so far as possible, but inevitably a composite construction does not lend itself to the greatest refinement in this respect, and on account of the long journeys a large storage battery capacity

necessitates two sets of batteries being carried, besides considerable other equipment, such as overhead water storage tanks, in conjunction with the usual air pressure water raising system under car.

The lighting equipment conforms to the railway company's standard practice as followed for equipment built in the past, with the exception that the steel conduit for wiring is entirely removed from the roof, and inspection is obtained from special junction boxes with weather-proof covers extending through the roof, the conduit proper passing between the roofboards and the headlining. The annunciator wiring is also executed in conduit. Current is supplied to the lamps and fans by dynamos for all cars, double batteries of 500 ampere hours capacity being furnished except in the case of the baggage cars and colonist sleepers, which have a single set of batteries of 240 ampere hours capacity. The Safety Car Heating and Lighting Co.'s fixtures are provided and especially designed, metal-cased, slate switchboards are provided for the sleeping and dining cars; these cars are also furnished with electric exhaust fan sets, having a capacity of 400 cub. ft. of air per hour. Fifteen watt, 12 candle power lamps are furnished throughout and 10 in. non-oscillating electric fans with takedown attachment are used. Candle lamps are used for auxiliary lighting purposes. Hot water circulation heating system is used on all cars, except the baggage and postal cars, which are fitted with straight steam equipment in conjunction with stove auxiliary. Composition flooring, laid on sectional galvanized steel, is provided on all cars and so formed as to provide sanitary corners for all outside edges. The baggages and postal cars have sheathed ceilings, the remaining cars being furnished with canvas with gold leaf and dutch metal to the railway company's standard patterns. The end construction throughout is designed to meet primarily the United States standard specifications for mail cars, this being considered a satisfactory basis.

For the baggage cars, the railway company's standard practice was not altered from the equipment of that class purchased previously. Arrangement was made, however, to carry two sets of desks and filing cases, also sleeping accommodation and a vault. Auxiliary lighting equipment for passenger cars is carried in a sealed box located in the centre portion of the car, there being 24 candle lamps and a double set of candles furnished. Emergency wrecking tool cases and auxiliary outfit, also a thaw-out hose 50 ft. long, designed to connect directly to a thawout connection on train line of each car, are maintained in sealed cases on baggage cars. A steam-water mixer is attached to the basin water supply, to heat the water as desired during the winter.

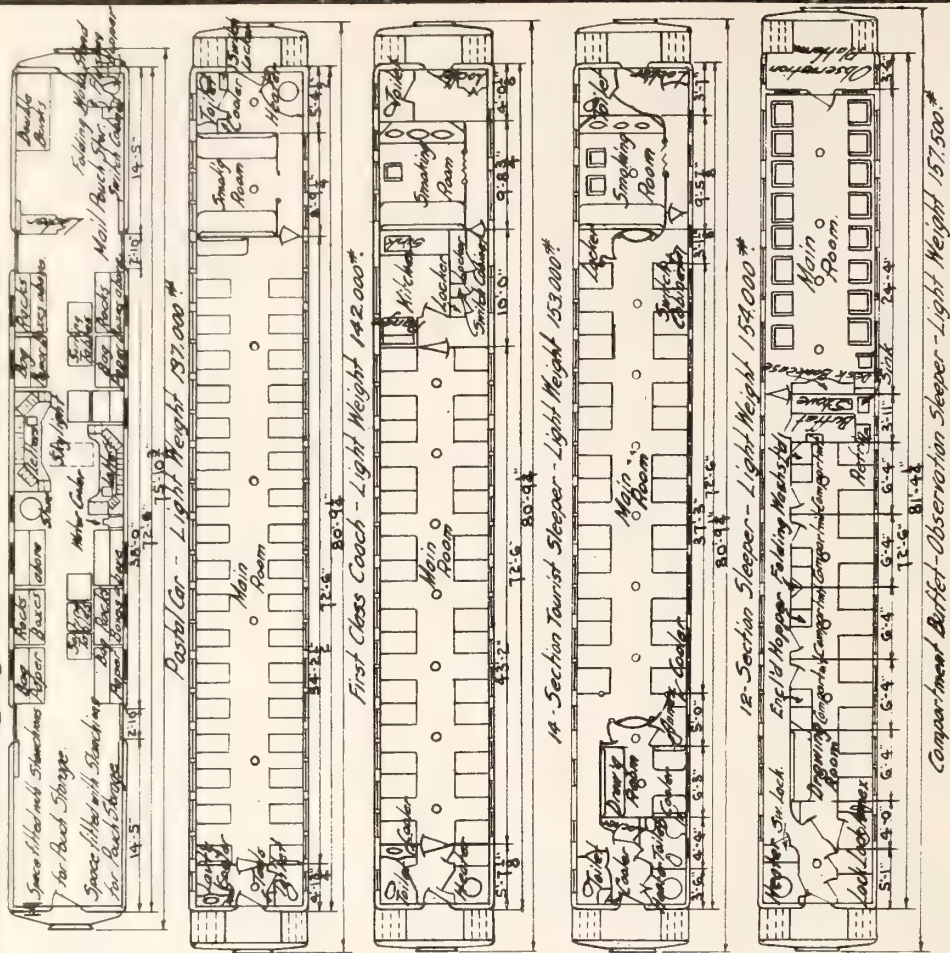
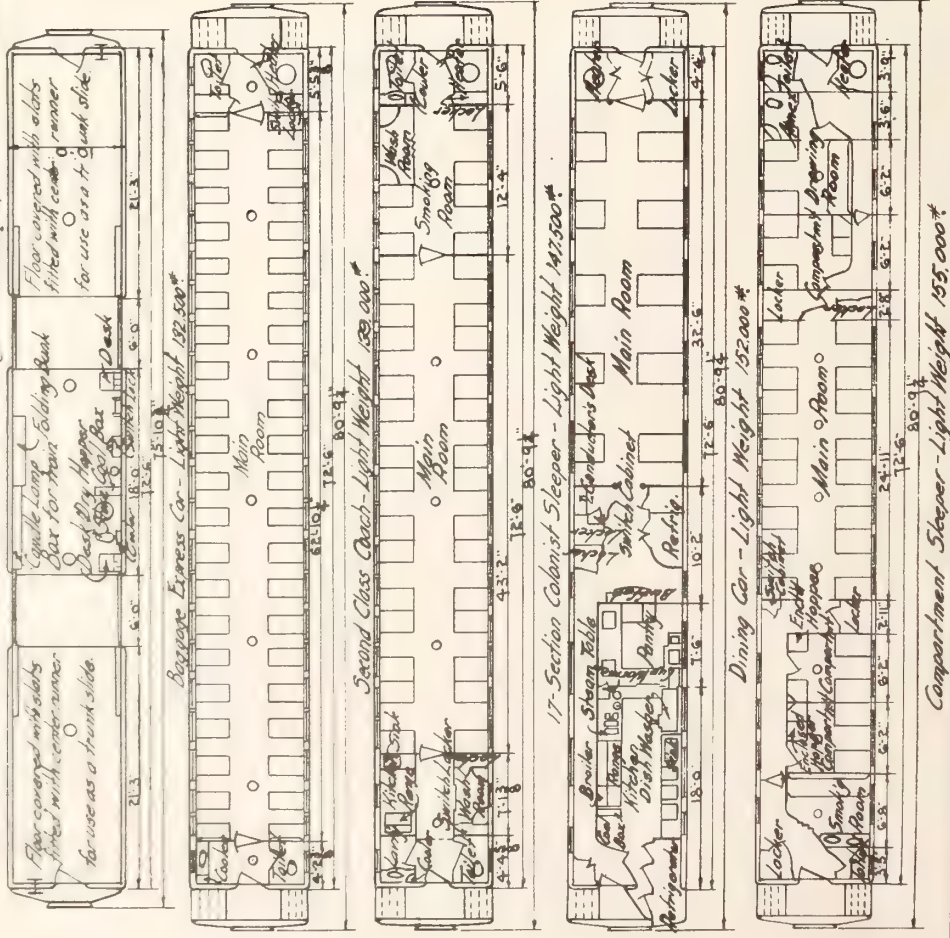
On account of operating for a short distance and being obliged to maintain local mail service through United States territory and for the reason that the

type of car standardized by the U. S. Post Office Department has been satisfactory to all concerned, it was adopted for the cars built recently. Several novel features were embodied in the design, chiefly on account of restrictions from following usual standard practice for this class of equipment. No gas auxiliary lighting was provided, this necessitated the use of a 350 watt electric coffee heater. Double windows, besides storm sashes, for service in winter had to be furnished and therefore a novel scheme of drop sash fixtures had to be devised so as to allow the upper or screened section of top sash to operate as intended. Weather conditions necessitated the use of condensation collectors for skylight over letter cases, and extreme care was exercised in designing the glass fastening frame, which is of sheet copper, to avoid any leakage, which might become serious on account of the possible collection of large quantities of snow and ice. The wiring was carried out entirely in steel conduit and the train line connected so as to draw current as desired from any car in the train. The light distribution is in exact accordance with the latest recommendations for postal cars and 15 watt lamps were installed throughout. Large overhead tanks are provided and furnished with water level gauges, and hot water attachments were included for basins. The sides and ends of car are painted a light grey, while the ceiling is of a lighter shade.

Second class cars are now being generally superseded by colonist sleeping cars for transcontinental train service, but the type of second class car shown in the accompanying plan, is especially well adapted for local business, or through service, where a maximum number of passengers have to be carried. The maintenance cost on a car of this style is considerably less than that of a colonist sleeper, principally because of the absence of bunks and kitchen, the latter being unnecessary for harvester excursions, where men form the great majority of the passengers, as they purchase sardines, crackers and sandwiches from news agents; besides this a second class car weighs about 7 per cent. less than a colonist sleeper. A large water capacity and plenty of ventilation is essential to the proper operation of a car of this class. Square deck and side finish, all in natural birch, was used in conjunction with low back reversible seats upholstered in pantasote.

The railway company's usual design of first class car was used, except that slight modification obtained with respect to the style of smoking room employed. High back reversible seats were installed and upholstered in green plush for main room, while the smoking room sofas were covered with pantasote. Empire deck with oval oak sashes and square outside gothics fitted with clear pressed prism glass, was employed, the finish throughout being of plain mahogany, relieved with three line striping and single white holly striping for curtain boxes.

Steel Framed Passenger Car Equipment for Canadian Northern Railway System Transcontinental Trains.



Experience gained from service of a large number of colonist sleeping cars, caused the railway company to provide ample facilities for washing and cooking which are absolutely essential for this type of equipment. The usual square deck and finish throughout was employed, the interior being of natural birch. Ample ventilation and large water supply is necessary also for a large smoking room. Extreme judgment is required in the design of tourist sleeping cars, in order not to divert first class traffic, and it is also necessary to provide an arrangement of sufficient merit to meet the severest competition. The railway company

considered it inadvisable to furnish berth lamps for this class of car, this being the only exception as compared with standard sleeping car. The upholstery throughout is executed in pantasote and the finish is of plain mahogany. Announcators are provided and the usual smoking room arrangement as employed in standard sleeping cars is furnished. Extremely large locker accommodation for bedding and provisions is necessary in a car of this type, as the great volume of travel in this service is that of family groups, journeying from coast to coast, or nearly so.

The dining cars are similar to the type

used in the past, having a seating capacity of 30. Square beam ceilings, in main room and passageways, in conjunction with circular side plate coving, was employed as in previous cars; the interior gothics were changed from leaded art glass to white pressed prism glass with matted back and lamp fixtures to correspond. All inlay marquetry was abandoned, in common with the practice for all other classes of equipment. White enameled steel refrigerators were employed and provided with automatic lighting switches, for use when open. Kitchen table top covering is of nickel-ine, flashed all around and protected on

line, flashed all around and protected on the edges with hard metal moulding. The railway company's standard design of hard coal range was used, also charcoal boiler with coal storage space below, and steam table provided with 2 meat trays, 2 gravy bowls, a soup pot, coffee urn and cup warmer, opening into the pantry. The dish washing machine is hand operated and fed from the overflow line of hot water boiler. An electric exhaust fan set, 2 large globe ventilators and a vanetype range hood deck ventilator are furnished, and provide extremely good ventilating conditions under all phases of train operation. The kitchen

floor is covered watertight with copper, a longitudinal gutter 3 ins. wide and 1 in. deep being provided in the centre, with holes making it self draining. The use of garbage cans has been avoided by providing a special deflecting device to the garbage chute and fitting it with a covered galvanized iron boxing with hinged lid. The lockers, vegetables bins and provision chests are all unit locked. Thawout tubes for drains are located in ice boxes. The pantry contains the usual storage lockers and sink, and is also furnished with a special water filter. The locker above the conductor's desk contains a special humidifier arrangement for cigar storage, consisting principally of a lamp, which burns continually in conjunction with a metal pan filled with an absorbing compound, holding water, which tends to keep the air moist. A central metal perforated shelf is also employed and the doors are fitted with pressed prism plate glass with matted finish, to diffuse the light. Cork tiling is used in the passageways, pantry and main room, so that carpet may be dispensed with during the summer. Vacuum cleaner connections are also installed in common with the practice for sleeping and parlor cars.

Such good results have been obtained with the railway company's standard 12 section sleeping cars that practically no alterations were made on account of the new service, except in the matter of refinement in detail. Electric exhaust fan sets were employed in smoking room and main body of car, entrance buzzers located at entrance to the drawing room, for use by the car porter, specially designed towel boxes were located over washstand in smoking room, to avoid having them saturated with the odor of smoke; boot locker opening into passage way from drawing room, special selfsupporting berth ladder with safety attachment and encased top tread were used, and all berth lamps were divided up in each section, so that a serious car failure would have to obtain if all lights were out in one section.

It is often difficult to design a car, especially a sleeping car, suitable for long distance and local travel as well, and this was the problem which presented itself in the development of the compartment sleeper shown in the accompanying plan which contains 8 standard sections, drawing room and compartments. The car is especially well balanced, and affords a maximum seating capacity without in any way detracting from the generally complex scheme of the layout. The general design embodies all the details which are applicable from the standard 12 section sleeping car already described, including the use of green frieze plush for upholstering throughout, except the smoking room, which is carried out in Spanish leather. The drawing room arrangement is the same as used in the sleeping cars and the compartments are of special design, including a folding washstand, which forms a table when closed, the cover containing a hand mirror, hair brush and comb, tooth brush, holder, clean and soiled towel racks and towel bars also large mirrors. The bottom portion is provided with a central shelf, and doors opening into the compartment and out into the passageway for use as a boot locker. Above the folding washstand is a corner water cooler, which is iced and filled from the passageway, through a small door. The hopper is enclosed and provided with an automatic disinfecting device, which operates continually and can be regulated as desired. Economy of space was of paramount

importance in the design of the observation cars, in order to include necessary storage room, in conjunction with a depressed platform, a seating capacity of 17 in the observation room, 4 compartments and 1 drawing room, also a buffet. It has been found advisable in this type of a car to locate the heater on the opposite side from the drawing room or compartment and wherever this is possible it should be done, otherwise great discomfort will be experienced by passengers in sections adjacent to the heater, for obvious reasons, and this was accomplished on both the compartment sleepers and observation cars. The buffet contains a compact refrigerator sink, humidifier cigar locker, 3-burner gas stove with water urn, percolator and toasting and frying attachments, metal lined bread locker, pie locker, canisters and water filter. The space being small, it was found advisable to provide a pair of 8 in. diam. globe ventilators in the top and connected to electric exhaust fan set, which also serves the observation room, smoking being allowed, and is indispensable for conditions of this sort when trains are standing still.

Auxiliary overhead water storage tanks are furnished in all of the cars and supply boxes as required. Suitable lockers are fitted up in each car for the reception of spare belts, train connectors, bulbs, belt fasteners and fuses. All dining and sleeping cars carry their own complement of candle lamps and spare candles in a sealed locker, also special soiled linen lockers with movable front gratings and floor slats.

The trucks for all cars are of the 6-wheel type, built up from rolled steel sections and plates and provided with cast steel centre plate supports. The wheels are 36 in. diam., steel tired, of bolted type wire section. Axles have 5 in. diam. journals, 9 in. long. The wheelbase of trucks is 11 ft. The colonist tourist, 12 section compartment and observation sleeping cars and the dining cars have locked centre pins and roller centre plates, and the baggage, postal, second class and first class cars have plain centre pins and flat centre plates.

Appreciation of C.P.R. in the Prairie Provinces. The United Farmers of Alberta, in convention at Calgary recently asked the Alberta Government to follow the C.P.R.'s example of pursuing the destruction of gophers. Statistics read, giving a record of the grain movement over C.P.R. lines from Sept. 1 to Dec. 31, evoked applause, and the company was congratulated on the showing made. At a sitting of the Saskatoon Royal Livestock Commission recently, the C. P. R. also came in for praise in connection with its efforts to promote the interest of livestock shippers.

A Quebec Quarry Railway Dispute. The dispute respecting the quarry railway connecting with the C. P. R. at St. Fravers de Salis, Que., which was decided in a Montreal court recently in favor of L. Labelle, has entered another stage. The defendant in the original suit is now preventing the plaintiff from using the line, giving as a reason that the purchase price has not been paid in full, and that he cannot avail himself of the right to operate.

The Pennsylvania Rd. has completed two years without a single fatality amongst its passengers; the lines east of Pittsburgh have not had a single passenger fatality for three years. During the past year, 361,572,114 passengers were carried.

The Magnitude of the Railway Industry.

Wm. C. Willard, A.M.Am.Soc.C.E., Assistant Professor of Railway Engineering, McGill University, Montreal, in the introduction to his work on Maintenance of Way and Structures, issued recently, says:

"On June 30, 1914, considering all tracks—single, second, third, fourth, etc., yard tracks and sidings—in round numbers a total of 384,000 miles of track were being operated in the United States, 41,000 miles in Canada and about 20,000 miles in the remainder of North America, making a grand total of approximately 445,000 miles in North America. In order to better realize the vast mileage this represents it can be stated in terms of the circumference of the earth. This track mileage would girdle the earth seventeen times. The distance of the moon from the earth is 239,000 miles and this railway mileage is almost twice that distance. In the year from June 30, 1910 to June 30, 1911, 1,815,239 persons were required to maintain and operate the railways of the United States, 141,224 persons were required to maintain and operate the railways of Canada, and about 75,000 those of the rest of North America. Considering Canada and the United States together, 1,956,463 persons were employed directly by the railways. The combined population of the two countries, according to the census taken in 1910, was 99,178,909. This means that one person out of each 51 was directly supported by the railways. The individual figures are one out of each 51 for both the United States and Canada, a surprising agreement of figures. A study of the report of the United States census for 1910 shows that the production of supplies directly consumed by the railways, but not manufactured by them, such as rails, ties, bridge steel, locomotives, cars, etc., required the employment of about 750,000 persons. In Canada the proportion is doubtless about the same, but if the number is assumed at but 50,000 the total number of persons directly and indirectly employed by the railways of the United States and Canada in 1910 was 2,756,000. The same census report gives the average number of persons per family in the United States as 4.5 in 1910. If it is assumed that but one out of each four persons employed directly or indirectly by the railways had the average family, 2,310,000 must be added, giving 5,066,000 as the number of persons supported by the railways. Dividing this into the total population it is seen that one person out of every 20 of our total population is dependent upon the railways for a living. These figures do not include electric roads or street railways, but stand alone for steam roads."

Australian Railway Construction.—It is reported that a conference is to be held between the Australian military advisers and the railway commissioners of the various states of the Commonwealth, to consider the construction of strategic railways in addition to the transcontinental railways under consideration and building.

The British Government Management Committee, now operating the railways in Great Britain, has decided to abolish the system of booking individual seats in cars, and will only book whole compartments and sleeping berths. The amount of work involved and the shortage of employes are given as reasons for this.

Was a Pioneer Tunnel Advisable at Rogers Pass?

J. G. Sullivan, M.Can.Soc.C.E., Chief Engineer, Western Lines, Canadian Pacific Railway, has favored us with a copy of a letter he has written *Engineering News*, New York, in answer to an article on the above mentioned subject, which was published in that paper and reproduced in *Canadian Railway and Marine World* for February. Mr. Sullivan's letter is as follows:

Your criticisms and questions would appear logical and reasonable, if, as you seem to think, they were based on the idea that speed was the only object we had in mind, but the most important factor, and the one that must govern all good engineering, is the factor of economy, and this was the sole factor that was considered in making our decision. Time was a factor in this larger question of economy, but much smaller than some others. We considered time to be worth approximately \$750 a day. In a circular letter sent out to contractors inviting them to bid, dated April 8, 1913, the following statements appeared.

"The necessity for this tunnel is so great and the expenditure so large that it would be worth considerable money to this company to have the tunnel completed as soon as possible. Therefore, everything also being equal, the party who will guarantee completion in the shortest time will be the party who will receive the work."

"I would be glad if you would give us prices on the European method of tunneling, which is to drive a very small heading and take out the bench, working from several headings into this small drift. Tunnels in Europe have been driven by this method at two or three times the speed that any tunnel was ever driven in the U. S. or Canada, and I would like to be able to place before the management figures for doing this work according to this method. I would be glad if you would state in your proposal the amount per day that you would be willing to have inserted in a contract to be paid as a bonus for time saved over the agreed time, the same amount to be exacted as a penalty for the time lost, being the time between the fixed day of completion and the actual date of completion. We are of the opinion that this sum should be about \$750 a day."

The writer, however, was aware at this time that the chances of American contractors tendering a reasonable figure on the European method was very remote, in fact, after having studied some of the prices paid for labor in some of the large Swiss and Italian tunnels, we were forced to the conclusion that theirs was not a practicable method for this country, where labor is so expensive. On March 13, 1913, the writer reported to the management his ideas on this subject. To quote from that report:

"Referring to the progress that we hope to make in the driving of the Rogers Pass tunnel. I advised you in my report of Oct. 22, regarding the relative speeds of driving tunnels on the American continent compared with those that have been driven through the Alps. I have given the matter considerable study since and have come to the conclusion that the European method of driving a small lower heading and stopping out the remainder of the tunnel is too expensive on this side on account of the difference in the cost of labor."

I then described in general the methods which we proposed and which we have

practically followed out. The method desired was one by which we would be able to handle the minimum amount of material by hand and the maximum amount by steam shovel. By driving a heading in the centre of the excavation required for the completed tunnel, making this heading just large enough so that we could handle in the same, steel that would reach from the perimeter of this advance heading to the perimeter of the completed tunnel, and then drilling holes at right angles to the axis of the tunnel, enabling us to shoot at once the entire section required for the enlargement of the tunnel and this shooting was done in the following manner. Six holes at the bottom of the tunnel, having been previously shot out, they would load six holes in the next ring back in the bottom and all the side holes of the first ring up to a point a little over half way up the sides of the tunnel. This would continue until the tunnel began to fill up, and then some of the advance rings in upper portion of the tunnel would be shot and this process continued until the tunnel was choked full of muck. There was usually shot, about six rounds (or 30) of holes before the steam shovel started to clean up. In some of the harder rocks that shot well, they were able to shoot a greater distance. The most shooting done at one time up to date was 84 feet. This method enabled us to handle about 85 per cent. of the total excavation of the tunnel proper with steam shovels. This was the prime object to be obtained, and how that could be done without interfering with the work of the shovel was solved by driving the pioneer heading or tunnel, to be used as a by-pass for removing the muck from pioneer and advance headings; for ventilating ducts; air, water pressure pipes, etc., the result being that work was carried on continuously at all points, irrespective of shooting at other points, work only stopping at the local points at which shooting was being done. As there were no air pipes or water pipes, or any obstruction whatever passing over the muck pile in front of the shovel, the shovel was able to excavate 85 per cent. of the total excavation almost as easily as if it had been an open cut.

Our expectations have been more than realized, as is proved by the speed and the cost of the work. The cost of driving this tunnel through rock, including in this price the cost of driving 19,610 lin. ft. of pioneer tunnel; 12 cross cuts each about 40 ft. long; installation of plant including freight on same; the proportionate cost of building about 5 miles of temporary railway tracks, and other overhead charges plus 10 per cent. on all expenditures, will amount to a little less than \$5 a cubic yard for tunnel excavation in the tunnel proper. I may add further, that in reply to my invitation of April 8, 1913, the contractors who are doing the work, having in mind the method which was later adopted and which was suggested by myself and one of their engineers, bid \$6.10 a cubic yard with a time limit of 42 months from date of signing contract. Other responsible and supposedly expert tunnel contractors bid from \$8 to \$11.25 a cubic yard, with time limits varying from 42 to 48 months. I do not know what method these latter contractors proposed to employ but I always presumed it would be some modification of the European method. We also received an estimate of \$5.50 a cubic

yard for tunnel excavation from a very reputable American expert tunnel contracting firm who would do the work on a percentage basis and would be willing to forfeit a large portion of their percentage if they did not keep the price within the estimate. They however, estimated the time at 58 months. At the speed they promised for driving tunnel in rock, and figuring the time it took our contractors to get into rock at both ends on account of heavy cuts, it would have taken them 8 or 9 months longer than the estimate, or something over 5½ years. The method that they proposed to employ was to remove tunnel right from a face, loading muck by steam shovel.

Now, as far as speed is concerned, on account of large cuts and soft ground at the approaches, the shovel doing the enlargement work did not reach the rock on the east end until Jan. 1, 1915, and on the west end until Feb. 1, 1916. On Dec. 19, 1915, when the heading was completed, the shovels were two miles apart. Had the conditions been such that we could have got into the tunnel proper at earlier dates, I do not think there is any European record that would not have been broken. We are driving the tunnel at the rate of better than three miles a year for the last year. During Jan. 1916, the shovel in the east end made an advance of 946 lin. ft.

In conclusion, I wish to say, that in Europe, where drill runners, as I understand, get 90 cents to \$1.25 a day, and laborers something like 75 cents, the method followed in driving the Loetschberg tunnel may be economic as well as rapid, but all the evidence that we have goes to show that where we have to pay from \$4 to \$5.50 for drill runners and \$2.25 to \$3 for laborers, per day, the method we have adopted is by far the most economical.

New African Railway. A railway which will be of immense importance in time of peace was built with remarkable speed primarily for the purpose of facilitating the invasion of German Southwest Africa by the troops under General Botha. It connects the railway systems of Southwest Africa and the Union of South Africa, extending 300 miles from Kalkfontein in the former to Prieska on the Orange River in the latter. The new line saves many hundred miles of travel between points in South Africa and those in Southwest Africa as compared with the old route by rail to Cape Town and thence by boat to the ports of the late German colony now under British military control. Through trains are now running from South African points to Walfish Bay.

Light Railways for War Purposes.—By the use of light railways, the Germans have been enabled to run lines close up to the trenches. A network of such lines has been built throughout the occupied territory in Belgium and France, thus relieving road traffic and generally assisting in the handling of supplies and men. The lines are narrow gauge, and consist of high grade steel rails of light weight, and the whole is built up in sections, so that track is laid on the level in practically a ready made manner.

The National Union of Railway Men, of Great Britain, announced recently that it had lost 1,020 members by death in the war.

Birthdays of Transportation Men in March.

Many happy returns of the day to:—
W. G. Annable, General Passenger Agent, Canadian Pacific Ocean Services, Ltd., Montreal, born at Ottawa, Mar. 3, 1875.

John Archibald, Locomotive Foreman, C.P.R., Coquitlam, B.C., born at Edinburgh, Scotland, Mar. 13, 1872.

C. F. Black, Attorney, Central Vermont Ry., St. Albans, Vt., born at Burlington, Vt., Mar. 5, 1884.

George Bury, Vice President, C.P.R., Montreal, born there, Mar. 6, 1866.

Allan Cameron, Superintendent, Land Branch, Department of Natural Resources, C.P.R., Calgary, Alta., born near Owen Sound, Ont., Mar. 14, 1864.

F. G. J. Comeau, General Freight Agent, Dominion Atlantic Ry., Halifax, N.S., born at Meteghan River, N.S., Mar. 10, 1859.

W. A. Cooper, Manager, Sleeping, Dining and Parlor Cars and News Service, C.P.R., Montreal, born there, Mar. 22, 1871.

A. E. Cox, General Storekeeper, Canadian Northern Ry., Winnipeg, born at Huddersfield, Eng., Mar. 12, 1863.

Hon. N. Curry, President, Canadian Car & Foundry Co., Montreal, born in King's County, N.S., Mar. 26, 1851.

C. T. Delamere, acting Engineer of Construction, Eastern Lines, C.P.R., Montreal, born at Brainerd, Minn., Mar. 18, 1881.

Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co., Montreal, born there, Mar. 4, 1876.

Frederick Elliott, President, Victoria Navigation Co., Ltd., Thurso, Que., born at Montreal, Mar. 8, 1858.

W. R. Fitzmaurice, Assistant Superintendent, Moncton and Ste. Flavie District, Intercolonial Ry., Newcastle, N.B., born at Bedford, N.S., Mar. 19, 1870.

C. Forrester, Superintendent, Stratford Division, Ontario Lines, G.T.R., Stratford, born at Wanstead, Ont., Mar. 5, 1876.

Jas. D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Ry., Ottawa, Ont., and President, Canadian Electric Railway Association, born at St. Andrews, Que., Mar. 26, 1851.

R. A. Gamble, General Yardmaster, Winnipeg Terminals, C.P.R., born at Dublin, Ireland, Mar. 1, 1876.

E. P. Goodwin, ex-Inspecting Engineer, National Transcontinental Ry., Baie Verte, N.B., born there, Mar. 17, 1865.

J. Halstead, Division Freight Agent, C.P.R., Calgary, Alta., born at Bracebridge, Ont., Mar. 2, 1877.

R. M. Hannaford, M.Can.Soc.C.E., Assistant Chief Engineer, Montreal Tramways Co., Montreal, born there, Mar. 22, 1865.

C. A. Hayes, General Traffic Manager, Canadian Government Railways, Moncton, N.B., born at West Springfield, Mass., Mar. 10, 1865.

H. T. Hazen, M.Can.Soc.C.E., Chief Engineer, Toronto Suburban Ry., Toronto, born at Truro, N.S., Mar. 14, 1870.

Joseph Hobson, M.Can.Soc.C.E., Consulting Engineer, G.T.R., Hamilton, Ont., born at Guelph, Ont., Mar. 1834.

J. I. Hobson, Treasurer, Canada Steamship Lines, Ltd., Montreal, born at Guelph, Ont., Mar. 30, 1872.

N. J. Holden, President, The Holden Co., Ltd., Montreal, born at Nobleton, Ont., Mar. 22, 1866.

A. R. Holtby, Master of Bridges and Buildings, Mountain Division, Grand Trunk Pacific Ry., Prince Rupert, B.C., born at Rawdon, Que., Mar. 23, 1859.

Frank Lee, M.Can.Soc.C.E., Principal

Assistant Engineer, C.P.R., Winnipeg, born at Chicago, Ill., Mar. 7, 1873.

R. W. Long, Division Freight Agent, G.T.R., Hamilton, Ont., born at Appin, Ont., Mar. 20, 1873.

T. W. Lowe, General Boiler Inspector, Western Lines, C.P.R., Winnipeg, born at Montreal, Mar. 30, 1858.

J. M. McKay, Superintendent, District 1, British Columbia Division, C.P.R., Revelstoke, born at Tiverton, Ont., Mar. 13, 1868.

Owen McKay, M.Can.Soc.C.E., Chief Engineer, Essex Terminal Ry., Walkerville, Ont., born in Ross Tp., Renfrew Co., Ont., Mar. 13, 1848.

Col. H. H. McLean, K.C., M.P., President, St. John Ry., St. John, N.B., born at Fredericton, N.B., Mar. 22, 1855.

M. Magiff, Superintendent of Car Service and Telegraphs, Central Vermont Ry., St. Albans, Vt., born at Planks Point, N.Y., Mar. 24, 1852.

Sir Donald D. Mann, Vice President Mackenzie, Mann & Co., Ltd., and Vice President Canadian Northern Ry., Toronto, born at Acton, Ont., Mar. 23, 1853.

H. H. Melanson, General Passenger Agent, Canadian Government Railways, Moncton, N.B., born at Scadouc, N.B., Mar. 9, 1872.

T. Milne, Locomotive Foreman, C.P.R., Windsor, Ont., born at Arbroath, Scotland, Mar. 3, 1856.

J. V. Murphy, General Agent, C.P.R., Portland, Ore., born at Bowmanville, Ont., Mar. 5, 1885.

Peter Paton, Purchasing Agent, Canada Steamship Lines, Ltd., Montreal, born at New Lovell, Ont., Mar. 13, 1869.

F. W. Peters, General Superintendent, British Columbia Division, C.P.R., Vancouver, born at St. John, N.B., Mar. 25, 1860.

J. W. Pugsley, Secretary, Department of Railways and Canals, Ottawa, Ont., born at Amherst, N.S., Mar. 12, 1861.

E. H. Sewell, City Passenger Agent, C.P.R., Sherbrooke, Que., born at Quebec, Mar. 17, 1875.

C. J. Smith, Manager and Secretary, Montreal Warehousing Co., Montreal, born at Hamilton, Ont., Mar. 10, 1862.

W. Y. Soper, Vice President, Ottawa Electric Ry. Co., Ottawa, Ont., born at Oldtown, Me., Mar. 9, 1854.

E. F. L. Sturdee, General Agent, Passenger Department, C.P.R., Boston, Mass., born at St. John, N.B., Mar. 29, 1876.

A. A. Tisdale, Assistant to Vice President and General Manager, and Purchasing Agent, Grand Trunk Pacific Ry., Winnipeg, born at Mount Vernon, Ont., Mar. 8, 1874.

G. W. Vaux, General Agent, Passenger Department, Union Pacific Rd., Chicago, born at Montreal, Mar. 21, 1866.

A. D. Watt, District Locomotive Foreman, Grand Trunk Pacific Ry., Prince Rupert, B.C., born at St. Louis, Que., Mar. 5, 1874.

A. T. Weldon, Assistant General Freight Agent, Canadian Government Railways, Moncton, N.B., born at Dorchester, N.B., Mar. 6, 1876.

D. O. Wood, General Freight Agent for Ontario, Allan Line Steamship Co., Toronto, born at Kleinburg, Ont., Mar. 16, 1864.

H. K. York, Car Foreman, C.P.R., North Transcona, Man., born at Victoria Corner, Carleton Co., N.B., Mar. 20, 1881.

Block Signal Systems in Canada and the United States are said to represent an investment of over \$108,000,000.

The Canadian Overseas Railway Construction Corps in Flanders.

Roland Hill, writing from the Canadian Army Corps Headquarters in Flanders to the Toronto Star, says:—"The specialization in the Canadian army strikes you immediately. Many other units that were looked upon as frills have proved more than useful overseas.

In the Railway Construction Corps each man is a specialist in something. It is such a useful organization that the Imperial authorities have borrowed it. I found them building railways. British military engineering rules are strict and unbreakable, but these Canadian engineers have mastered them and here they are building a standard gauge line within shell zone in Flanders with Canadian rails and ties, even Canadian steel work to brace bridges. Whilst I was chatting with a colonel, a request came in for two divers. They were wanted for the base. There were five in the battalion, so they had no trouble in sending two.

New Books, Etc.

Any of the books mentioned may be obtained through Canadian Railway and Marine World at the published price.

MAINTENANCE OF WAY AND STRUCTURES, by Wm. C. Willard, A.M.Am.Soc.C.E.; Assistant Professor of Railway Engineering, McGill University. Cloth, 6 x 9 in., 451 pages, 232 illustrations, 24 tables, McCraw Hill Book Co. Inc., New York, \$4.

This first edition contains the following chapters: 1, Introduction; 2, Organization and rules; 3, Roadway; 4, Ballast; 5, Wooden ties; 6, Substitute ties, economics of ties; 7, Preservation of timber; 8, Rails; 9 and 10, Track fastenings, rail joints, tie plates, track spikes, rail anchors, other track fastenings; 11, Stresses in the track; 12, Design of track; 13, Signs, fences and highway crossings; 14, Accessories to track; 15, Bridges, trestles and culverts; 16, Switches, frogs and turnouts; 17, Work of maintenance of way department; 18, Roadway machines, small tools and supplies; 19, Records; 20, Accounts; 21, Annual programme for maintenance of way and structures.

Canadian Pacific Ry. Summer Hotels—Following are the opening and closing dates for the 1916 season:—Algonquin Hotel, St. Andrews-by-the-Sea, June 20 to Sept. 30; Banff Springs Hotel, May 15 to Oct. 15; Chateau Lake Louise, June 1 to Oct. 15; Emerald Lake Chalet, June 15 to Sept. 30; Glacier House, May 15 to Oct. 15; Kootenay Lake Hotel, June 15 to Sept. 15. The other hotels operated by the company are open during the entire year.

The Belgo-Canadian Mines and Timber Lands Co. has been incorporated under the Dominion Companies Act with power, among other things, to construct railway sidings, tramway lines, telegraph and telephone lines on lands owned by the company, and necessary to its development. The company is to have a capital of \$100,000, and office in Montreal. The provisional directors are: C. Laurin, S. E. Melkinan, G. J. Barry, A. Beique, Miss L. Lavigne, Montreal.

Canada Nitro Products, Ltd., has been incorporated under the Dominion Companies Act, with \$5,000,000 capital and office at Toronto, to manufacture war munitions, explosives, etc., and in conjunction therewith to own and operate steam and other vessels, wharves, docks and other navigation facilities.

Railway Mechanical Methods and Devices.

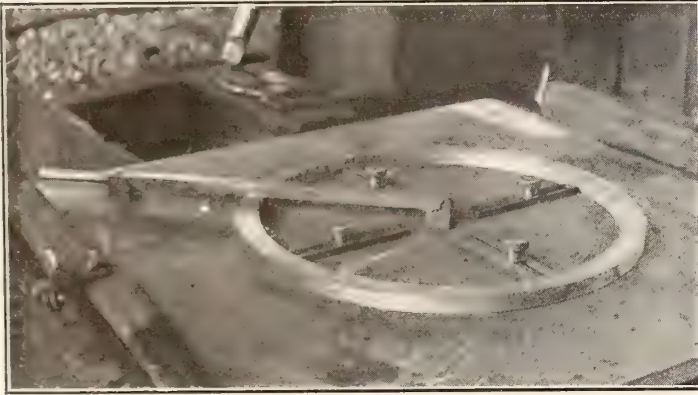
Laying Off Segmental L Packing in Michigan Central Shops.

The arrangement shown in the accompanying illustration is in use in the Michigan Central Rd. locomotive shops at St. Thomas, Ont., for laying out segmental L packing rings preparatory to cutting and rivetting the sections together. The two component rings from which the final

edge. This scribed mark is then placed opposite the radial angle, which locates the second scribed line, and so, forth, until all the lines are marked off.

The rings are cut off in the lathe by mounting on a table on the tool carriage, with a saw cutter on an arbor between the lathe centres. Following the cutting up, the parts are drilled and rivetted together, forming the commonly found L piston packing ring.

One of these slide valves is shown on the right, the valve on the other cylinder being hid by the cylinder itself. The valve of the cylinder on the right is operated by the short vertical handle, while the other valve is operated from below by a treadle, located directly below the immediate foreground. The tube to be operated on is placed on the angle iron support, against the near jaw, the other jaw being forced against it by a pressure



Laying off Segmental L Packing Rings.

segmental ring is made are first machined and fitted the one on the other, and then taken to the table for laying off. The table consists of a planed face cast iron sheet, which can be mounted on any convenient stand or bench. On it are scribed a number of circles, varying in diameter by about $\frac{1}{4}$ in., for setting. On the face are four arms, held in quartering positions by means of knurled thumb



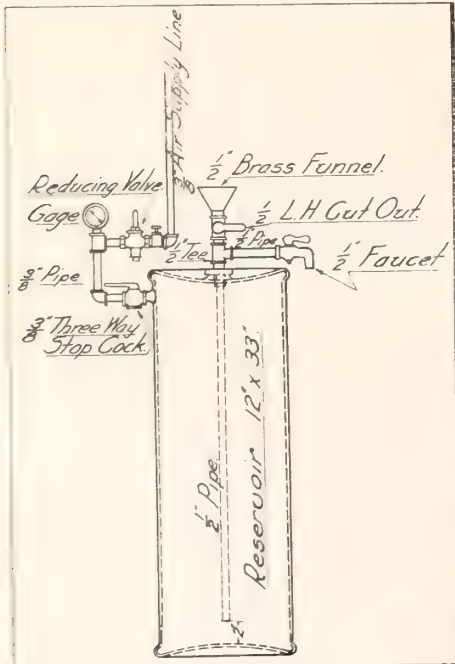
Hydraulic Tube End Expanding Machine with Piston Valves.

Hydraulic Tube End Expanding Machine in Grand Trunk Shops.

The process of handling locomotive boiler tubes through the safe-ending operation, as practiced in the G.T.R. shops at Stratford, Ont., was described in detail in Canadian Railway and Marine World for Nov. 1912, the article outlining the machine used for clamping the tubes while the end was being expanded

on the treadle, clamping the tube. Pushing in the other handle forces up the expanding mandrel into the tube. With the slide valve, the pressure required on either valve is very small, as the internal valve pressures are equalized as in a locomotive piston valve, as opposed to the ordinary D valve.

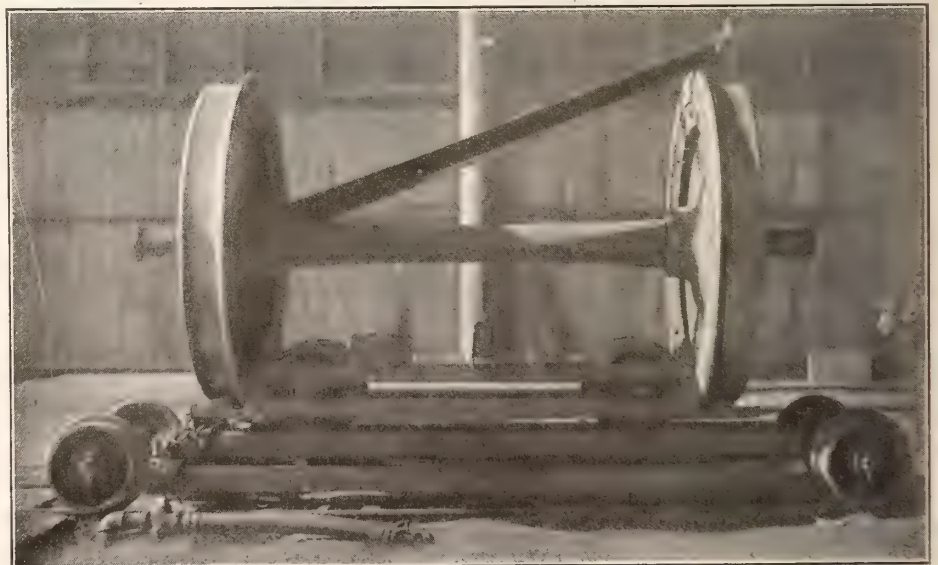
Elevator Record at Fort William.—It is announced that the Grand Trunk Pacific Elevator Co. has established a record



Coal Oil Storage Tank.

screws, and which can be radially adjusted as may be seen. By means of the scribed circles the radial fingers may be set for the particular sized ring to be marked. Hinged from the centre of the plate is a straight edge arm, fitting when depressed into a block in one corner. Marked on the face of the plate are radial scribed lines at the different angles to which the rings are to be cut.

A mark is first made on the ring with a scribe along the edge of the straight



Car Wheel Handling Truck.

by the forcing in of a mandrel. As originally made, this machine consisted essentially of two hydraulic cylinders, actuated by two flat slide valves. While performing the work satisfactorily, the hydraulic pressing on the back of the flat slide valve made the latter so hard to move that to handle the machine for a whole day was most fatiguing to the operator, especially as each tube end required four valve movements. In consequence, the machine has since been redesigned with piston valves, as shown in the accompanying illustration.

at its elevator at Fort William, Ont., in unloading from cars, between Oct. 1 and Dec. 23, 1915, 21,994,000 bush., or 18,500 cars of grain. This is an average of 241 cars a day of $12\frac{1}{2}$ working hours. During October, 6,500,000 bush. were loaded into vessels, 8,987,000 bush. in November, a daily average of 300,000 bush. Between Dec. 1 and 12, 5,700,000 bush. were loaded into vessels, a daily average of 475,000 bush.

Railway employees in Canada and the United States number approximately 1,900,000.

Coal Oil Storage Tank on Canadian Northern.

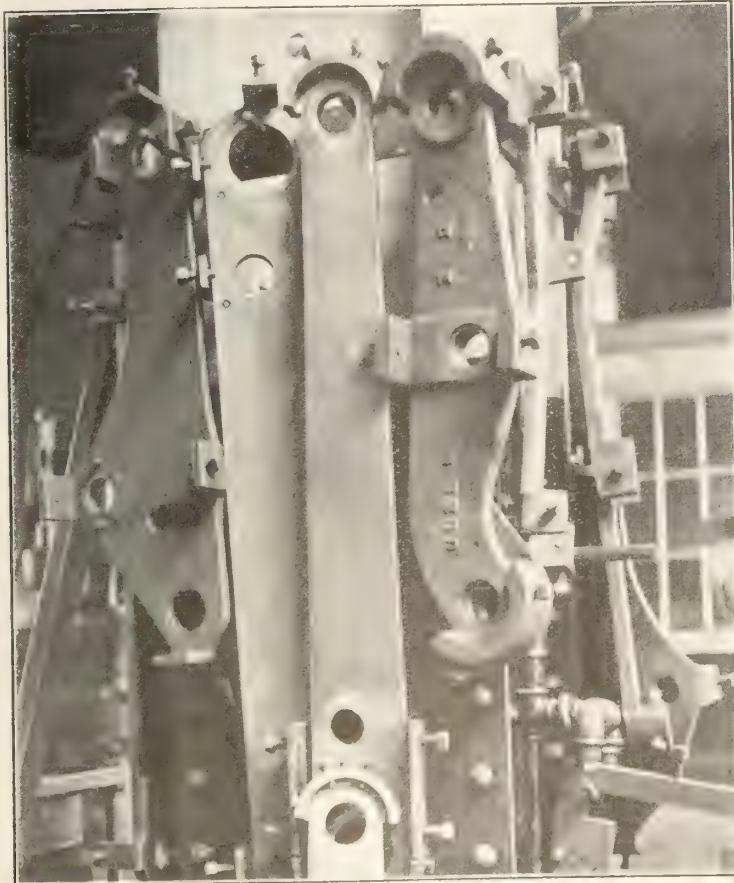
On account of the continual risk of accident incidental to the maintenance in sufficient quantities of inflammable oils at divisional points and terminals, it has been considered advisable by almost all good roads to develop a convenient and safe means of caring for this product, instead of allowing a multiplicity of oil cans to accumulate and be scattered around. The following arrangement is used by the Canadian Northern.

An old air brake reservoir forms the container, and is piped with air from the shop line, the oil intake being through a suitable funnel connection. The filling operation is carried out by closing the cut out valve near the reducer and opening the bleed cock, which permits the air to

Clegg, Air Brake Foreman, C.N.R., Winnipeg, for the above information.

Small Rod Jigs in Grand Trunk Shops.

For most of the standard rocker arms, radius links, etc., used on the G.T.R. motive power, the company's shops at Stratford, Ont., have special drilling and reaming jigs. A number of these are shown suspended from a shop column in the accompanying illustration. They are made of either iron castings or steel forgings, with inserted hardened steel bushings at all the holes. In the jig, the article to be drilled or reamed is held and centred by various means, the principal one being by means of set screws in close proximity to the hole in the work, bearings against the work.



Jigs for Drilling and Reaming Rod Pin Holes.

escape, allowing the whole of the reservoir to be filled with oil, after the cut out valve below the funnel has been opened. The reservoir being filled, it is only necessary to close the cut out valve below the funnel, open the one near the reducer and a good flow of oil will be obtained by opening the faucet. In closing down the system when tank is full of oil, it has been found advisable to shut off the reducing valve cut out, as well as the faucet, and open the bleed cock, which allows any accumulation of air to escape freely to the atmosphere. All piping and valves are located above the oil level, which makes it possible to avoid any leaking or dripping. The $\frac{1}{2}$ in. supply pipe inserted inside of the reservoir is held in place by a $\frac{1}{2}$ in. coupling, threaded at one end on the outside for $\frac{3}{4}$ in. The tank head, being threaded to suit, allows the whole to be inserted and held in place. The reducing valve is set at a pressure of 2 lbs. per sq. in. We are indebted to T.

Machining Hub Liners in Grand Trunk Shops.

The jig on which locomotive hub liners are machined at the G.T.R. shops, Stratford, Ont., is shown in the accompanying illustration. It is an old back cylinder cover, faced on the two ends to sit on the boring mill table, and receive the liner blank. There are 4 holes in the upper flange, corresponding to 4 stud holes that are drilled and tapped in the blank prior to the boring mill operation. By means of these the liners are held on the jig for facing and boring.

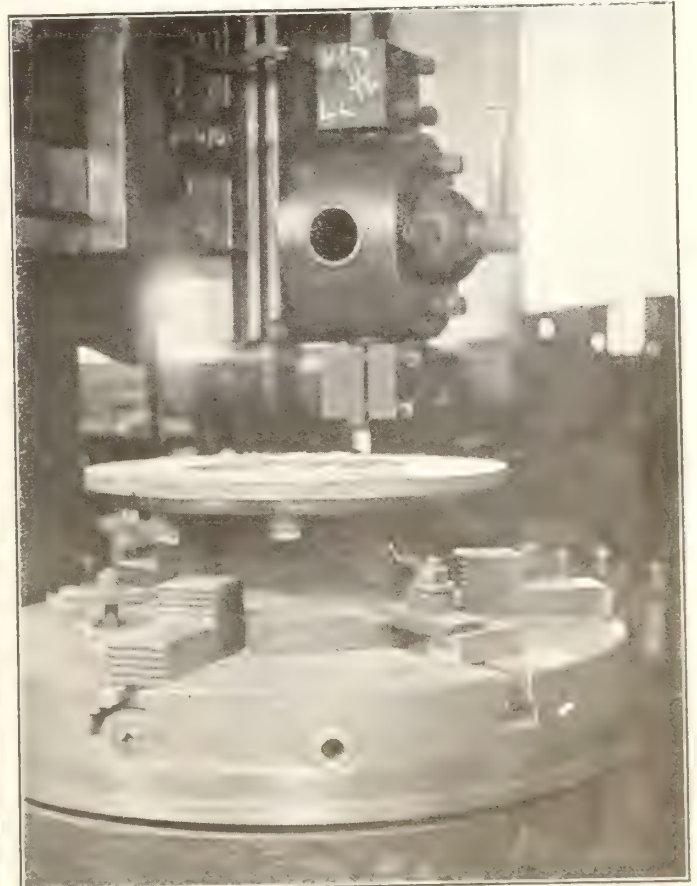
The Toronto University Engineering Society has 411 members on active military service.

Russian Freight Rates.—It is announced that rates on grain traffic, except oats, between Russia and China, for export, have been considerably reduced.

Car Wheel Handling Truck on Canadian Pacific.

D. Condell, Car Foreman, Canadian Pacific Ry., Nelson, B.C., has built a unique car wheel handling truck, which, as far as the writer knows, is the only one of its kind in use. As illustrated herewith, it is composed of two small trucks of four wheels each. The lower or main truck runs along a narrow gauge track parallel with and between the main repair tracks, while the upper and smaller truck, which carries the wheels, is placed on a combined revolving table, track and telescoping track section. The latter is adjustable to different distances to be bridged from the truck to repair tracks.

When wheels are to be changed the wheel truck is run along the narrow gauge track until opposite the storage,



Jig for Machining Hub Liners in the Boring Mill.

where the table is turned around and the telescoping track section pulled out until it engages the main repair track. This is bridged by a separate section carried on the truck at all times. The upper truck is then moved along its track until opposite the storage. The storage being parallel with the repair tracks the truck can be run until it comes in line with the storage, where wheels can be placed on the truck with very little effort, the tracks being level with the truck. The truck and wheels are then returned to the main narrow gauge track, track sections replaced, table turned round into position, and the truck run along its track until opposite the car requiring wheels. When in position the table is turned at right angles to the repair track and the operation of extending the track sections and running the upper truck into position on the repair track is repeated.

Two hardwood wedges, having boiler plate shoes to cover the track and hold

wedges in position, are placed on repair track in line and on a level with the wheels on truck, which are easily rolled off the wedges to the repair track. The wedges are reversed to the opposite side and old wheels placed and returned to the storage, all with one operation.

This truck was built from the scrap pile, the wheels being removed from an old plain wheel truck, such as is used at nearly every repair track. A pair of car wheels of any size can be easily moved by two men from any part of storage track to repair tracks. In the same yard,

before this truck was built, four to six men were required to place a pair of wheels on repair track. Wheel truck is built low enough so that, while loaded with a pair of wheels, it can be run under a car and the wheels placed in position without removing the car truck.

Orders by the Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed the paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which they were drawn.

General order 156. Jan. 18.—Ordering that, by Feb. 1, all railways which commence, terminate, or intersect any lines listed in Altitudes in Canada, by James White, as well as those which touch tidewater, be based upon mean sea level as provided in that book.

General Order 157. Jan. 31.—Ordering that, on and after Feb. 1, all profiles submitted by railway companies subject to Board's jurisdiction which commence at, terminate at, or intersect with any lines listed in "Altitudes," by James White, as well as those which touch tidewater and are not listed, be based upon mean sea level, as provided in "Altitudes," and rescinding general order 156, Jan. 18.

24636. Jan. 10.—Authorizing C.P.R. to build branch for Crows Nest Pass Lumber Co. at mileage 1.2, Waldo Subdivision, B.C., to be completed within six months.

24637. Jan. 11.—Authorizing C.P.R. to build at grade, diversion of portions of road allowances on south and west boundaries of s.w. $\frac{1}{4}$ Sec. 17-39-18, w.3.m., Sask.; and close diverted portions.

24638. Jan. 11.—Authorizing C.P.R. to build, at grade, road diversion adjoining southeast boundary of its right of way, in lieu of existing road allowance on western boundary of n.w. $\frac{1}{4}$ Sec. 13-34-3, w.4.m., Alta.; and close same.

24639. Jan. 7.—Authorizing Pontiac County, Que., to build highway crossing over C.P.R., in Pontiac.

24640. Jan. 10.—Authorizing the Niagara, St. Catharines & Toronto Ry. to open for traffic portion of its line from St. Catharines to Niagara-on-the-Lake, mileage 0 to 12.2; and extension to lake front on Lot 12, Con. 1, Grantham Tp., mileage 0 to 0.68.

24641. Jan. 10.—Authorizing C.P.R. to refund to Spanish River Pulp & Paper Mills, Sault Ste. Marie, Ont., \$333.84, overcharged on shipment of machinery from Ansonia, Conn., to Espanola, Ont.

24642, 24643. Jan. 10.—Approving Bell Telephone Co. agreement with Arundel Development Co., Dec. 30, 1915, and Lansdowne Rural Telephone Co., Dec. 29, 1915.

24644. Jan. 10.—Ordering Grand Trunk Pacific Ry. to erect, within 30 days, a station at Fort Fraser, B.C., with platform 230 ft. long, station not to be below Board's standard plan 1 B.

24645. Jan. 11.—Authorizing British Columbia Government to build highway crossing over Nelson & Fort Sheppard Ry. (G.N.R.) at Mountain station, Nelson.

24646. Jan. 10.—Ordering G.T.R. to plank Welland Ave., St. Catharines, Ont., from curb to curb; to move cedar post at s.e. corner; and erect crossing signboard at north side of track and street line; Niagara St. Catharines & Toronto Ry. to pay cost of laying and maintaining planking between its rails and for 8 ins. on each side thereof; work to be completed by Feb. 15.

24647. Jan. 12.—Amending order 24628, Jan. 10, re suspension of certain express companies' tariffs.

24648. Jan. 12.—Approving plan and specifications of A. Moore drain, to be built under Canada Southern Ry. in west half of Lot 30, Southwold Tp., Ont.

24649. Jan. 14.—Relieving C.P.R. from providing further protection at crossing at mileage 71.2, about 3 miles west of Point du Lac station, Que.

24650. Jan. 13.—Relieving C.P.R. from providing further protection at crossing at Hatton, Sask.

24651. Jan. 13.—Relieving, subject to certain conditions, C.P.R. from providing further protection at crossing $\frac{1}{2}$ mile east of Binscarth, Man.

24652. Jan. 11.—Amending order 23878, June 18, 1915, re Canadian Northern Ry. crossing north of Sec. 27-46-23, w.2m., Sask.

24653 to 24655. Jan. 14.—Authorizing New York Central Rd. to rebuild bridges A-40, 0.78 mile north of Athelstan; A-71, 1.1 miles north of St. Stanislas, and A-41, 0.83 mile north of Athelstan, Que.

24656. Jan. 15.—Dismissing Grand Trunk Pacific Ry. application to remove its regular station agent at New Hazelton, B.C.

24657. Jan. 14.—Approving revised location of Grand Trunk Pacific Branch Lines Co.'s. Moosejaw Northwest Branch, and land required for station grounds, in west half of Sec. 26-22-6, w.3.m., Sask.

24658. Jan. 17.—Authorizing C.P.R. to build spur for I. Georgetti, Trail, B.C.

24659. Jan. 17.—Authorizing G.T.R. to build extension to siding for William Davies Packing Co., Toronto.

24660. Jan. 15.—Approving Niagara, St. Catharines & Toronto Ry. crossing of road allowance between Secs. 9 and 10, Stamford Tp., Ont.

24661. Jan. 18.—Extending time for reconstruction of C.P.R. bridge at Notre Dame St., St. Pie, Que., so that plans may be filed by Mar. 1 and the work completed by Mar. 31.

24662. Jan. 17.—Authorizing London Railway Commission to construct a branch of London & Port Stanley Ry. for London Rolling Mills Co., and McClary Manufacturing Co., London, Ont., to be completed within six months.

24663. Jan. 18.—Authorizing C.P.R. to build spur for Ingersoll Machine Co., Ingersoll, Ont.

24664. Jan. 18.—Authorizing G.T.R. to rebuild bridges 15, 18 and 24 on District 22, Ontario Lines.

24665. Jan. 19.—Authorizing Canadian Northern Ontario Ry. to divert Park Drive, York Tp.

24666. Jan. 18.—Amending order 23219, Jan. 27, 1915, re Hamilton Radial Ry. tracks at Sherman Inlet, Hamilton, Ont.

24667. Jan. 18.—Authorizing Eastern Canadian Passenger Association to publish general order 151, Nov., 1915, and regulations attached thereto.

24668. Jan. 21.—Extending to June 1 time within which G.T.R. shall install bell at second highway crossing east of Baden station, Ont.

24669. Jan. 19.—Ordering Canadian Northern Ry. to appoint station agent at Plato, Sask., until May 1, and between Sept. 1 and May 1 in each year until otherwise ordered; caretaker to be employed when agent is withdrawn.

24670. Jan. 20.—Authorizing Pennsylvania Rd. pending further order, to operate trains over portion of International Bridge Co. and G.T.R., according to agreement of Mar. 31, 1913.

24671. Jan. 21.—Extending to June 1 time within which Canadian Northern Ontario Ry. shall build crossing over Second Concession road allowance in Goulbourn Tp.

24672. Jan. 22.—Ordering that crossing of London St. Ry. by London & Port Stanley Ry., required by order 24629, Jan. 7, be maintained by London Railway Commission.

24673. Jan. 22.—Suspending, pending further order, certain tariffs of Canadian Northern Ry., Grand Trunk Pacific Ry. and C.P.R., effective Feb. 1, cancelling all free return transportation for live stock shippers west of Port Arthur, Ont.

24674. Jan. 22.—Dismissing Western Retail Lumbermen's Association complaint against increase by railway companies in the carload minimum on brick in Western Canada.

24675. Jan. 24.—Authorizing Canadian Northern Ontario Ry. to build across highway between Lot 35, Con. 2, and Lot 35, Con. 3, Markham Tp.

24676. Jan. 22.—Ordering Canadian Northern Ry. to pay W. Bell, Winnipeg, \$1,600 for damage to his property, as provided under order 19120.

24677. Jan. 24.—Authorizing Grand Trunk Pacific Ry. to remove spur built for Inland Lumber & Building Co., in Edmonton, Alta.

24678. Jan. 24.—Approving revised location of Grand Trunk Pacific Ry. from Lot 5935 to north boundary of Lot 5277, mileage 134 to 144, Yellowhead Pass west, B.C.

24679. Jan. 26.—Amending order 24630, Jan. 7, by substituting Lake Erie & Northern Ry. for London & Lake Erie Ry. The error in the original order was noted and corrected in the summary published in Canadian Railway and Marine World for February.

24680. Jan. 27.—Suspending, pending hearing on Feb. 8, certain tariffs covering charges for the use of heated refrigerator cars on C.P.R., Canadian Northern Ry., G.T.R., and Toronto Hamilton & Buffalo Ry.

24681. Jan. 26.—Authorizing C.P.R. to build additional siding for O'Brien Munitions, Ltd., at Renfrew, Ont.

24682. Jan. 26.—Extending for 60 days from date time within which C.P.R. shall install gates at Talbot Ave., Winnipeg.

24683. Jan. 25.—Authorizing G.T.R. to build temporary spur and trestle in Toronto Harbor Industrial District, for Canadian Stewart Co.

24684. Jan. 26.—Relieving the G.T.R. from providing further protection at crossing at Stamford, Ont.

24685. Jan. 27.—Relieving Canadian Northern Ry. from providing further protection at crossing just east of Ashville station, Man.

24686. Jan. 26.—Dismissing application of milk shippers for general order fixing minimum number of milk cans, or minimum carload rate, necessary to entitle shipping station to separate car.

24687. Jan. 27.—Authorizing British Columbia Southern Ry. to build highway over its track at Erickson Road, Creston, B.C., cost to be paid by British Columbia Government.

24688. Jan. 26.—Dismissing application of village of Forward, Sask., for order directing C.P.R. to furnish site for coal shed; or for Canadian Northern Ry. to grant joint rate to junction at Forward that shall be at least as low as present C.P.R. tariff to Forward spur, or Axford station.

24689, 24690. Jan. 27.—Approving Bell Telephone Co. agreements with Mono Mills Independent Telephone Association, Jan. 13, and Udney Telephone Co., Jan. 11.

24691. Jan. 28.—Authorizing clearances at G.T.R. sidings serving Canada Forge Co., Welland, Ont.

24692. Jan. 28.—Ordering C.P.R. to carry out certain work on ditch at mileage 79.2, Quebec Subdivision, by May 1.

24693. Jan. 28.—Authorizing Grand Trunk Pacific Ry., pending further order, to remove regular agent at Willow River, B.C., caretaker to be appointed for accommodation of passengers and l.c.l. freight and express matter.

24694. Jan. 29.—Ordering G.T.R. to concur in joint freight tariffs to be published and filed by Canadian Northern Ry. to apply on grain and grain products, in carloads, from Port Arthur, Fort William, and Westfort, Ont., to G.T.R. stations, via North Bay, Ont. This order is given fully on another page.

24695. Jan. 22.—Authorizing City of Windsor, Ont., until Dec. 31, to permit pedestrians to cross Michigan Central Rd., pending application to have Michigan Central Rd. build level crossing at Wyandotte St., and reserving leave to city to apply for extension of time, in event of application not being finally determined prior to Dec. 31.

24696. Jan. 31.—Approving schedule showing train service on Vancouver, Fraser Valley & Southern Ry. (B.C. Electric Ry.).

24697. Jan. 31.—Ordering G.T.R. within 90 days to install automatic bell at highway just north of Allanburg station, Ont., 20 per cent. of cost to be paid out of railway grade crossing fund.

24698. Jan. 31.—Authorizing C.P.R. to build spur for Ford Motor Co. of Canada, Winnipeg.

24699. Jan. 31.—Ordering Canadian Northern Ry. to appoint station agent at Morrin, Alta.

24700. Feb. 1.—Authorizing Canadian Northern Ontario Ry. to build across certain highways in Mara Tp., between mileage 67 and 82.

24701. Jan. 31.—Authorizing Grand Trunk Pacific Ry., pending further order, that, after two weeks notice has been given making Gainford, Alta., a prepaid station, to remove the station agent, caretaker to be appointed for accommodation of passengers and l.c.l. freight and express matter.

24702. Feb. 2.—Ordering Canadian Northern Ontario Ry. to attach passenger car to trains 107 and 108, between Hawkesbury and Ottawa, to and from Henderson Ave. station, Ottawa, for passengers to and from Ottawa only; leaving Ottawa and Hawkesbury as at present; all stations may be treated as flag stations; service to be in effect for three months.

24702. Jan. 29.—Authorizing Canadian Northern Ry., pending further order, to remove station agent at Cumberland, Ont.; caretaker to be appointed.

24704. Feb. 1.—Authorizing C.P.R. to build spur and sidings for Dominion Sugar Co., at Chatham, Ont.

24705. Feb. 3.—Authorizing Vancouver, Victoria & Eastern Ry. & Navigation Co. (G.N.R.) to remove spur to Britannia Trading & Lumber Co., near Burnaby, B.C.

24706. Jan. 28.—Amending order 24462, Nov. 19, 1915, re sale of Canadian Northern Ry. tickets on main floor of Union Station, Toronto.

24707. Feb. 4.—Authorizing C.P.R. to operate over subway at Main St., Winnipeg.

24708. Feb. 4.—Ordering C.P.R. to keep station as Ashdod, Ont., clean, warm and properly lighted for accommodation of passengers and provide outside bracket lamp for platform, between station door and main walk to train.

24709. Feb. 4.—Extending to June 1 time within which G.T.R. shall install bell at highway just north of Allanburg station, Ont.

24710. Feb. 7.—Authorizing C.P.R. to build diversion of road allowance at mileage 52.3, Wilkie Subdivision, Sask.

24711. Feb. 5.—Authorizing G.T.R. to build siding for Hay & Co., Missouri West Tp., Ont.

24712. Feb. 7.—Ordering C.P.R. to install bell by June 1 at Main St., Chesterville, Ont., 20 per cent. of cost to be paid out of railway grade crossing fund, cut-out and bonding to be in front of platform on westbound track.

24713. Feb. 7.—Ordering Grand Trunk Pacific Ry. forthwith to appoint station agent at Quinton, Sask., until May 1, and between Sept. 1 and May 1 each year until otherwise ordered.

24714. Feb. 9.—Dismissing complaint of A. H. Mayland, Calgary, Alta., against completion of loading charge and diversion charge made by C.P.R. on pigs or livestock shipments through Calgary.

24715. Feb. 9.—Authorizing C.P.R. to build spur for John Deere Plow Co., Regina, Sask.

24716. Feb. 9.—Authorizing C.P.R. to build spur for Shell Co. of California, Inc., near Barnett, B.C.

24717. Feb. 8.—Approving plans and specifications of Southwold Tp., Ont., showing work to be done on the A. Moore drain under G.T.R.

24718. Feb. 9.—Authorizing Michigan Central Rd. to build siding for Norton Co., Chippawa, Ont.

24719. Feb. 10.—Relieving C.P.R. from providing further protection at crossing of Kemptonville Road, near Kempton, Ont.

24720. Feb. 5.—Authorizing Lachine, Jacques Cartier & Maisonneuve Ry. (G.T.R.) to build across certain highways between Cote de la Visitation Road and Belanger or Daniel Sts., Montreal; authority granted herein to be exercised by Dec. 31, 1917, or order to become inoperative.

24721. Feb. 11.—Authorizing C.P.R. to build spur for Port Moody Steel Works, Ltd., Port Moody, B.C.

24722. Feb. 14.—Relieving Canadian Northern Ry. from providing further protection at second crossing east of Oshawa station, Ont.

24723. Feb. 12.—Ordering C.P.R. to install improved automatic bell at highway west of Welsford station, N.B., by June 1, 20 per cent. of cost to be paid out of railway grade crossing fund.

24724. Feb. 14.—Suspending, until further order, proposed cancellation of joint rates from Eastern Canada to points in Western Canada, applying via routes published in Supplement 8 to G.T.R. tariff C.R.C. no. E-2962, and Supplement 18 to G.T.R. tariff C.R.C. no. E-2977, issued to take effect Feb. 15.

24725. Feb. 15.—Authorizing Algoma Central & Hudson Bay Ry. to use bridge at mileage 150.61, over Kaniwabe River, Tp. 28, R. 22, Algoma District, Ont.

24726. Feb. 15.—Approving agreement between Bell Telephone Co. and National Telephone Co., Dec. 31, 1915.

24727. Feb. 16.—Disallowing Canadian Northern Ry. special proportionate freight tariff, C.R.C. no. E-732, applicable from Toronto to Regina, Sask., on tank and steel structural material, in carloads, originating at Sarnia.

24728. Feb. 16.—Rescinding order 23483, Apr. 6, 1915; and ordering that C.P.R. trains crossing Portage Ave., Winnipeg, be limited to 6 miles an hour.

24729. Feb. 15.—Ordering Canadian Northern Ry. to appoint station agent at Brunkild, Man., Mar. 1.

24730. Feb. 15.—Authorizing Premier Coal Co. to carry its roads or entries under railway right of way.

24732. Feb. 15.—Approving agreement between Bell Telephone Co. and Kamouraska Telephone Co., Dec. 30, 1915.

24733. Feb. 17.—Approving clearances at country grain elevators for C.P.R., Grand Trunk Pacific Ry. and Canadian Northern Ry., and rescinding order 24157, Sept. 10, 1915.

24734. Feb. 17.—Authorizing C.P.R. to build extension to siding for M. J. O'Brien, Horton Tp., Ont.; and a siding for Energete Explosives, Ltd., at mileage 69.28, Chalk River Subdivision, Ont.

24735. Feb. 17.—Authorizing Grand Trunk Pacific Ry. to build connection between G.T.P. Edmonton Exhibition Association spur and Edmonton Radial Ry., Edmonton, Alta.

24736. Feb. 17.—Authorizing Canadian Northern Ry. to cross and divert highway in n.w. ¼ sec. 5-35-7, w.2m., Sask.

24737. Feb. 17.—Authorizing Algoma Central & Hudson Bay Ry. to open for traffic revision of its main line in Sec. 37, Vankoughnet Tp., and Lot 12, Con. 1, Deroche Tp., Algoma District, Ont.; and to use bridge at mileage 19.10.

24738. Feb. 17.—Authorizing G.T.R. and City of Toronto to rebuild Bathurst St. Bridge.

24739. Feb. 15.—Authorizing Canadian Northern Quebec Ry. to close Larose station during winter as flag station for passenger trains; station to be open from May 1 to Oct. 31 each year and to be lighted when required for accommodation of passengers.

General order, 158. Feb. 15.—Ordering that provisions of general order 153, Nov. 4, 1915, applicable to Canadian Freight Classification and any proposed new issue or supplement thereto, and to Canadian Freight Association, shall apply to Express Classification for Canada and to Express Association of Canada, in so far as they can be made applicable.

Canadian Pacific Railway Construction, Betterments, Etc.

In an interview at London, Ont., Feb. 8, George Bury, Vice President, is reported to have said there will be no new construction on the eastern lines during the year, and no new large works of betterment will be undertaken; all that will be done will be the necessary work of maintenance and ordinary and essential betterments.

Grant Hall, Vice President and General Manager, Western Lines, in an interview at Winnipeg on his return from a recent visit to Montreal is reported to have said, "There is no possibility of the C.P.R. embarking on any ambitious scheme during the continuance of the war. In view of the rather obscure financial outlook it has been decided not to proceed with the building of any new lines, but this matter will be given further consideration in the spring should conditions warrant. The necessary money for the completion of the Rogers Pass tunnel has been allotted, and that work will be completed this year. Provision has also been made for the erection of a commodious train shed or rather system of umbrella sheds at Winnipeg station, but the exact design to be followed has not been determined. In pursuance of the company's policy to encourage the live stock industry 35 additional stockyards will be built on the western lines during the year. Considerable expenditure will be made upon additions to the reservoir in connection with the water supply at Moose Jaw, Sask.; new icehouses will be erected at Weyburn, Sask., and Edmonton, Alta., and some new stations will be built on the line to Shaunavon. Generally the work for the year will include a considerable expenditure on ballasting, bank widening, etc., and 150 miles of track will be relaid with new heavy rails."

We are officially advised that the distance between Vantage, the present terminus of the Moose Jaw-Expanse branch, to the present terminus of the present Assiniboine branch is eight miles. The building of this mileage to connect the two branches is being urged, but the company has not at present in contemplation the construction of any new lines.

The fact that the water supply at Moose Jaw is to be increased is quoted as a sufficient answer to the press report that the company is considering the removal of the divisional point and shops from Moose Jaw to Swift Current.

We are officially advised that the betterments to be done on western lines during the current year will include the usual amount of renewals, the paving of the approaches to the freight shed at Regina, and the erection of umbrella sheds at Winnipeg station, the details for which have not yet been completed. The replacing of old with new steel will include 19.5 miles of 65 lbs. rails on the Aldersyde Subdivision, and the putting in of new 85 lb. steel as follows:—District 1, Manitoba Division, 41.1 miles; Winnipeg terminals, 5 miles; Brandon subdivision, 26 miles; Broadview subdivision, 12 miles; Swift Current subdivision, 1 mile; Medicine Hat subdivision, 15 miles; Calgary subdivision, 7 miles; Laggan subdivision, 4.4 miles; Cranbrook subdivision, 21.4 miles; Shuswap subdivision, 5.4 miles; Thompson subdivision, 9.2 miles; Cascade subdivision, 9 miles, a total of 177.1 miles.

The points at which new stockyards will be provided are:—Fertile, David and Regent, in Manitoba; Liberty, Brora, Grand Coulee, Lajord, Readlyn, Simpson, Tregarva, Belle Plains, Richardson, Lim-

erick, Renown, Kedleston, Pasqua, Griffith, Cadillac, Dilke, Holdfast, Forget, Froude, Kincaid, Young, Sifton, Tyvan, Ogema, Hazenmore, Penzance, Pilot Butte, Sedley, Ponteix, Stalwart, Wilkie, Tramping Lake, Naseby, Markinch, Leipzig, Kandahar and Biggar in Saskatchewan; Portreeve, Sceptre, Coaldale, Parkland and Beddington, in Alberta.

Railway Finance, Meetings, Etc.

Canadian Northern Ry.—There was deposited with the Secretary of State at Ottawa, Jan. 20, duplicate original of a trust agreement between the C.N.R. and the Central Trust Co. of New York, securing an issue of one year 5% secured gold notes. The issue is reported by New York papers to consist of \$2,500,000, of which \$2,000,000 is to be provided immediately and the balance on the deposit of some additional stock, and is secured by the deposit of \$205,000 of 4½% debenture stock of the C.N. Pacific Ry., guaranteed by the Province of British Columbia; \$209,000 of 4% C.N.R. debenture stock, and \$193,000 of 4½% first mortgage bonds of the C.N. Saskatchewan Ry., guaranteed by the Province of Saskatchewan.

Canadian Pacific Ry.—The directors on Feb. 15 authorized the payments of the following dividends for the period ended Dec. 31, 1915:—A dividend of 2% for the half year on the preference stock; a dividend of 2½% for the quarter on the common stock. The dividend on common stock is at the rate of 7% per annum from revenue and 3% from special income account. Both dividends are payable April 1 to shareholders of record Mar. 1.

Michigan Central Rd.—There has been deposited with the Secretary of State at Ottawa, an agreement dated Oct. 1, 1915, made between John Carstensen and other vendors, the Philadelphia Trust Co., trustee, and the Michigan Central Rd., relating to the M.C.R. Equipment Trust of 1915.

St. John & Quebec Ry.—The New Brunswick Government has called in for redemption the 4½% ten year bonds issued with the provincial guarantee, at the rate of 95 and accrued interest.

Temiscouata Ry.—Net earnings for Nov. 1915, \$3,502. Aggregate net earnings for 5 months ended Nov. 30, 1915, \$16,798.

Toronto, Hamilton & Buffalo Ry.—The Dominion Parliament is being asked to confirm an agreement made between the company, the Michigan Central Rd., the Canada Southern Ry., the New York Central Rd., the C.P.R., and the Trust Co., dated Feb. 1, making certain traffic arrangements for 50 years, and providing for the guarantee of consolidated mortgage bonds to be issued by the company.

Express Rates on Government Currency.—Ottawa press dispatch, Feb. 24. The Dominion Express Co. is making a bid for the carriage of all Government currency, exclusive of shipments of gold or silver. It has filed a special competitive tariff of rates on currency based on shipments forwarded or received by the Finance Department at Ottawa, to or from the Assistant Receivers-General, also on shipments moving between the latter at Victoria, Winnipeg, Toronto, Montreal, St. John, Halifax, and Charlottetown. The special currency rate per \$1,000 is \$2.10, and is said to be a decrease of about 60% from the old rates.

Improvement in Passenger Car Construction and Design.

By K. F. Nystrom, Chief Draughtsman, Car Department, Grand Trunk Railway.

The construction of a passenger car of today is radically different from what was considered the standard construction for a passenger car of, say, 10 years ago. We had then almost without exception, wooden cars, and each had practically the same construction, but through various causes nearly all railways have been forced to adopt a steel construction, at the same time maintaining the same design of car from a general viewpoint. As most railways have designed their own steel construction and each has its own particular merit, it is rather a difficult task to pick out one or two designs as being ideal, from the passenger as well as the railway point of view. It seems therefore timely, in a brief manner, to compare the old wooden car construction with the later designs of steel cars, from the standpoint of safety and comfort to the travelling public, and the initial cost and cost of maintenance from a railway standpoint.

The first cost, and cost of maintenance, are vital items to all railways today, as car equipment and maintenance run up to almost prohibitive figures and take a considerable portion of the railway company's yearly budget. Economy which could be exercised is sorely needed by every railway on this continent. We learn from statistics that approximately 42,000 miles of American railways are in the hands of receivers. An estimate based on authoritative figures, is said to show, that in the whole of the United

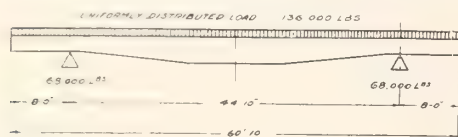


Figure 1.

States, less than 45,000 miles of railways earn an income of 6 per cent. or better on their total securities and that nearly 5/6 of the total mileage of the railways in the United States will probably not show an earning capacity of 6 per cent. on their securities during 1915. The fact is that the railways are forced to economize in every conceivable way, while on the other hand the travelling public is growing more and more pretentious and demand strong and up to date equipment with all modern luxuries. How long the railway companies will be able to meet the public demands under present laws and tariffs, is only a question of time. I hope, however, that the progress and development of the rolling stock for the comfort and welfare of the people will not be strangled by economic pressure.

Safety first is the slogan of the present time. The safety of the working man and of the people at large is at present considered as never before, and especially in passenger traffic on a railway this is carried to extremes, but the popular opinion regarding a safe public carrier does not always coincide with the actual facts, for instance an all steel car can be of weaker construction than a wooden car, but a passenger will be more satisfied to ride in a weaker steel car than in the stronger wooden car. The all steel car is considered by the travelling public as the only safe steam railway conveyance, however few practical men will deny that the superstructure of a well built wooden car

is as strong as the average superstructure of a modern steel car. They will, however, admit that the weakness in an all wood car lies in the underframe, on account of the continual increase of heavy trains and more powerful locomotives, which makes the service more severe on cars in long trains. In a good many instances a wooden underframe will be subject to more intense end shocks or im-

to sustain the forces imposed on a wood underframe. The wooden underframe is, therefore, a thing of the past in car construction for the reason stated above, and on account of the scarcity of suitable lumber. In studying a number of designs of cars I have found that in many cases it is economical to build the underframe sufficiently strong to carry the entire load, as well as to sustain the end

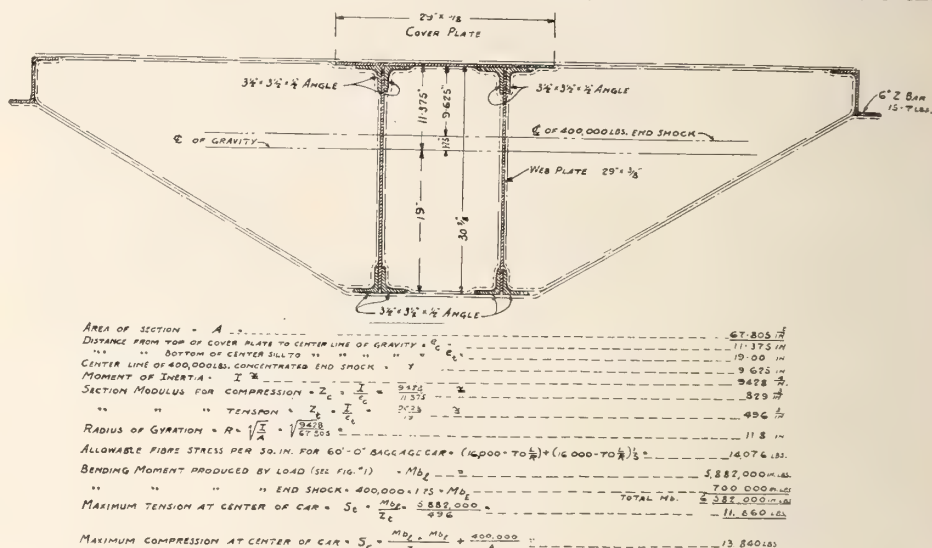


Figure 2.

fact than a wooden underframe should, or can stand. The passenger car truck will not be discussed in this paper, as there are at present two or three very good designs of clasp brake trucks which undoubtedly will become standard in the near future. Every car designer endeavors to get a design superior to any other construction. This, of course, is healthy competition, but the day when a stand-

shocks. If the underframe is of sufficient strength to withstand both the load and the end-shocks the side construction can be much simplified. This is particularly true of mail and baggage cars, as the side posts can be uniformly spaced, thus reducing the amount of detail work.

In order to illustrate the requirements of a modern underframe the following example is selected:—Figs. 1, 2 and 3

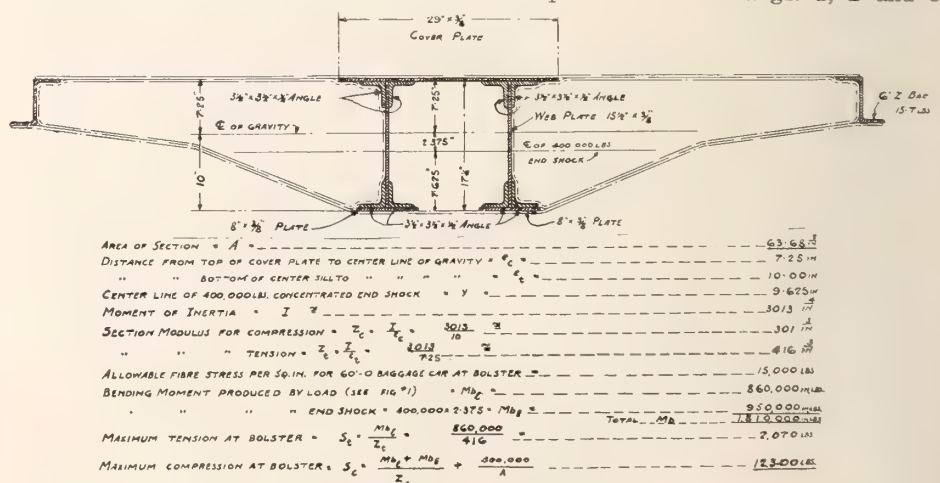


Figure 3, Section at Bolster.

ard passenger car, common to all railways can be adopted, is therefore, put off to an indefinite future.

The underframe, which is the back bone of the car, must be of sufficient strength to sustain all imposed loads, including those derived from end shocks. As the stresses produced from end shocks in a heavy modern passenger train are occasionally extremely high, we have to resort to steel underframe construction. The ultimate strength of wood is too low

show an underframe for a 60 ft. baggage car, considered as a beam on two supports, these supports being the two trucks under car. The weight of the car has been assumed as 70,000 lbs. for the car body, and 60,000 lbs. plus 10 per cent. for live load, making a total of 136,000 lbs. load on this underframe. This produces a bending moment of 5,882,000 in. lbs. at centre of car and 860,000 in. lbs. at bolster.

The weight of car represented in this

example is rather high and the live load is considered to be 66,000 lbs., which is considerably above the actual requirements for a baggage car or a mail car. The United States Railway Mail Service Department specification for a steel full postal car specifies a maximum of 50,000 lbs. live load. The bending moment in a 74 passenger car is less than in the above example. It can, therefore, be assumed that if an underframe is designed to withstand a bending moment of approximately 5,900,000 in. lbs. and an end shock of 400,000 lbs. it will be suitable for all classes of passenger cars.

The stresses imposed upon the underframe from end shocks must be dealt with separately. The underframe must be considered as a column and both direct and eccentric forces must be considered and for members in compression the stresses must be reduced in accordance with usual engineering practice. The American Railway Engineering Association has adopted an empirical formula reading as follows:—

$$\frac{L}{16000-70-\frac{R}{R}}$$

which has been approved by the U. S. A. Mail Service Department and allowed 20 per cent. greater fibre stresses than arrived at by using the above formula.

The above requirements for the underframe could easily be satisfied if the car designer could change the construction to suit the conditions, but unfortunately a number of standards are established which the car designed cannot change, such as truck height, coupler and buffer heights and the general clearance dimensions of cars. The car designer has, therefore, to compromise and be satisfied with a design which as closely as possible comes up to an ideal construction when considered from an engineering standpoint.

The sections shown in figs. 2 and 3 satisfy the requirements for a modern underframe in relation to load and end shocks. It will be observed from the respective figures that the extreme fibre stresses come well below the required limits of the U. S. A. Mail Service specification for all steel full mail cars, which is used as a foundation for all passenger car designs of today. The underframe considered in this example is probably not the most economical construction, for all designs but I have endeavored to give due attention to the construction from a maintenance standpoint, and not employed any section with less thickness than $\frac{3}{8}$ in., in order to provide ample bearing value for all rivets and to give reasonable allowance for deterioration, and an attempt has been made to reduce the number of different sizes of material so it will be noted that the size of centre sill cover plates and centre sill web plates are all the same. All angles employed are also of one size. All plates are $\frac{3}{8}$ in., so that the majority of details required can be obtained from the scrap cut from centre sills. The object, however, when analyzing the above underframe is not to produce an ideal design, but to show what a complex problem a car designer has to contend with.

End Framing.—It is necessary to have a substantial end frame to prevent telescoping, particularly if an efficient anti telescoping device is not employed. An end framing built in accordance with U. S. A. Mail Service Department specifications which calls for a section modulus for vertical end members not to be less than 65, of which 75 per cent. must be concentrated in the door posts and posts adjacent to door posts and the en-

tire framing well secured offers a very good construction which is amply strong.

Side Framing.—To prove that the superstructure of a wooden car is equally as strong as the steel construction of a steel car, I will compare the side posts in wood and steel cars. Fig. 4 shows a standard section of a wood post and fig. 5 shows a typical design of a steel post for steel cars. For comparison of strength of the two posts, as shown in figs. 4 and 5 consider the ultimate strength of ash to be 12,000 lbs. per sq. in. and 60,000 lbs. per sq. in. for steel; in other words, the steel to be five times as strong as ash, when these materials are subject to bending. In order to get expression as to strength for side posts, I wish to refer to the U. S. A. Post Office Department's specification for the construction of steel full postal cars, which reads as follows:—

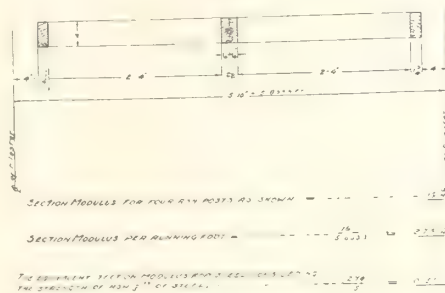


Figure 4.

"The sum of the section moduli taken at any horizontal section between floor line and top line of windows, of all posts and braces on each side of car, located between end posts, shall not be less than 0.30 multiplied by the distance in feet between the centre of end panels, a panel length being considered as the distance between lines of rivets in adjacent vertical post."

The quoted paragraph will probably be clearer to us if we reconstruct it to read as follows:—"The average section moduli on each side of car for side posts must not be less than 0.30 per running foot."

We will now consider one section of one side in a standard railway car, now being largely used, the section being from

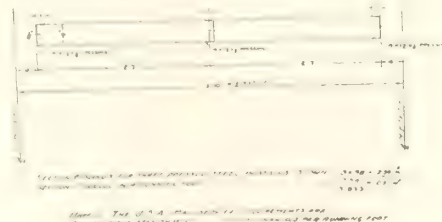


Figure 5.

centre to centre of pilaster, which includes lower windows with gothic above. The length of such section in a railway car is, on an average, 5 ft. 6 ins., or 5.8333 ft. The number of posts in 5.8333 ft. section is 4 for wood cars, 2 narrow and 2 wide, and 3 for steel cars. Referring to figures 4 and 5 we note that comparative section modulus for steel is 0.5 and for wood 0.55, the wood posts being 10 per cent. stronger than the steel post. Both constructions, however, meet the U. S. A. Mail Service requirements. This comparison shows that, as far as the strength of the side of a wooden car, when considered perpendicular to its side, which is vital in case of wreck, is at least in some instances stronger than a steel car. I wish, however, to make it plain that no claim is made to the superiority of the side framing in a wooden car over a steel car, considering same as a carry-

ing member or truss. A combination of wood and steel for side framing seems to me to be most practical.

Roof.—No one familiar with car construction and maintenance of cars will deny that the canvas roof, properly laid, gives remarkably good service; in fact, it will outlast the car if given reasonable care. When I say canvas properly laid, I consider it properly laid when it is applied in the same manner as the practice in shipbuilding, when laying canvas on the cabin roof, which lasts almost indefinitely if not abused. The steel roof, on the other hand, has not, up to the present, proved a success. Steel roofs having vertical expansion joint, about $1\frac{1}{4}$ in. in height soon wear out on account of the abrasive action of cinders. The deck screens in an all steel car are objectionable on account of pockets being formed behind the screen, in which gases, moisture and cinders collect which destroy the paint and in a short time a serious corrosion takes place, which cannot be detected before a car is sent to the shops for general repair. A steel car roof must be frequently painted, and it cannot be done with a canvas roof, if the regular "shopping" period for any reason is prolonged. In connection with the canvas roof it is understood that wood roof framing is properly constructed and tied together at frequent intervals with steel carline which should extend in one piece from side plate to side plate, to which they should be firmly secured.

The inside finish in all steel car is hard to restore to its original appearance, in case it must be touched up at isolated places, where the paint has been scratched, worn or peeled off. Wooden cars having stained and polished wood finish, can easily be restored to their original appearance in case the finish should be damaged.

In summing up I realize that I have only outlined passenger car design in a very general way, but I have tried to show what I believe to be the best design of car, looking from every angle, namely, economical from a railway, and safety and comfort from the travelling public standpoint, and to put this in a concise form, I believe that in designing a car for present use the following are the principle points:—

1. A steel underframe which will take care of all loads, strains and buffing shocks imposed on car, with an efficient buffer, draft gear and some device which will lock the trucks to the body of the car in case of accident to prevent telescoping or a turnover of the car, is absolutely necessary.

2. A substantial end frame which will stand a very severe buffing shock and prevent telescoping.

3. A combination steel and wood side framing and wood exterior finish.

4. A combination wood and steel roof covered with canvas properly laid.

5. An interior wood finish.

With this construction the railway can repair its own cars, in the old wooden car repair shops, without going to the expense of installing a considerable amount of modern machinery, which would be necessary with all steel cars. The travelling public will be provided with a car which will compare favorably in strength with an all steel car. The inside finish can be made more artistic, easier to maintain and simpler to renew when required. In case of wreck the passengers will have a chance to cut their way out from the debris, which is impossible in an all steel car.

The adoption of steam from the locomotive for heating passenger cars, and

lighting by electricity, practically eliminates the danger of fire. The all steel car is probably more fireproof, but when we consider that upholstering material and varnish and other details are inflammable, this car is comparatively as fireproof as an all steel car, and the temperature in this car will not be subject to such sudden changes in weather con-

ditions as the all steel car. It will be warmer in winter and cooler in summer, and will not develop any sweating, which is so obnoxious in all steel cars. I am, therefore, convinced that this type of car is the most satisfactory to all concerned from every point of view.

The foregoing paper was read before the Canadian Railway Club recently.

Railway Rolling Stock Notes.

The G.T.R., during January, received one box car, which had been built at its Elsdon, Ill. shops.

The Canadian Northern Ry. has received three 75 ton wrecking cranes from the United States.

The Intercolonial Ry. has received 2 consolidation locomotives from Canadian Allis-Chalmers Ltd.

The Canadian Pacific Ry. has decided to change the lighting of 62 passenger cars from gas to electricity.

The Nova Scotia Steel & Coal Co., has ordered 200 steel mine cars of 2,000 lbs., capacity from the Eastern Car Co.

The Acadia Coal Co. has ordered 200 composite and 150 steel mine cars of 2,000 lbs. capacity from the Eastern Car Co.

The Timiskaming and Northern Ontario Ry. has received two steel first class passenger cars, nos. 244 and 245, and two steel baggage and express cars, nos. 213 and 214, from the Pullman Co.

The Eastern Car Co. has shipped 1,878 of 2,000 freight cars, which the Russian Government ordered recently for use on the State Railways. The balance was expected to have been shipped by the end of February.

The Canadian Pacific Ry. will probably place an order outside its own works in the near future for 6 Pacific type passenger locomotives which will be more powerful than any others of that type in Canada at present.

The Imperial Oil Co. has ordered 25 two compartment, and 20 three compartment tank car underframes and trucks, from Canadian Car and Foundry Co. They will be delivered at Sarnia, Ont., where they will be equipped with tanks, etc., by the owners.

The Canadian Locomotive Co., between Jan. 1 and Feb. 12, shipped 15 decapod locomotives for the Russian Government. These are part of an order for 50 which were fully described and illustrated in Canadian Railway and Marine World for Jan.

The French Government has ordered an additional 2,000 freight cars from the Eastern Car Co., for use on the State Railways, but whether these are to be the same type as those now under construction by this company, some details of which are given on this page, has not been definitely announced.

The Canadian Pacific Ry. is about to build at its Angus shops, Montreal, in addition to the cars mentioned in Canadian Railway and Marine World for Feb., 825 standard box cars, with steel underframes, wooden body and steel ends; 100 automobile cars, 200 freight refrigerator cars, 50 passenger refrigerator cars, 30 stock cars, 3 furniture cars, 25 steel coal and ore cars.

Following are the chief details of the 150 steel underframes for flat cars of 50 tons capacity, which the Michigan Central Rd. have ordered from the Can-

adian Car & Foundry Co., as mentioned in our last issue:—

Length over end sills	40 ft.
Length over striking plates	41 ft. 1 1/4 ins.
Truck centres	30 ft.
Wheel base	5 ft. 6 ins.
Width over side sills	9 ft.
Width over flooring	9 ft. 4 ins.
Width overall	9 ft. 11 1/4 ins.
Height from rail to top of flooring	4 ft. 2 ins.
Height from rail to centre of draft gear	2 ft. 10 1/2 ins.
Height from rail to top of brake mast	5 ft. 10 ins.

The fish belly and side sills will be built up with plates and angles. The draft gear will be arranged for class G springs, and the couplings will be of the bottom operating type with patent uncoupling device.

The Canadian Northern Railway is said to be contemplating ordering from 16 to 20 Pacific type passenger locomotives and 30 consolidation locomotives. The following are the probable dimensions, etc.

PACIFIC TYPE.

Gauge	4 ft. 8 1/2 ins.
Fuel	Bituminous coal
Weight on drivers in working order	153,000 lbs.
Capacity of tender, coal	24,000 lbs.
Capacity of tender, water	6,000 imp. gals.
Driving wheelbase	13 ft.
Cylinders	24 in. diam. by 28 in. stroke
Driving wheels	69 in. diam.
Working boiler pressure	200 lbs.
Maximum tractive effort	40,000 lbs.

CONSOLIDATION TYPE.

Gauge	4 ft. 8 1/2 ins.
Cylinders	24 x 32 ins.
Driving wheels	63 in. diam.
Boiler pressure	200 lbs. per sq. in.
Driving wheelbase	16 ft. 6 ins.
Engine wheelbase	25 ft. 5 ins.
Tractive effort	50,000 lbs.
Tender coal capacity	12 tons
Tender, water capacity	6,000 imp. gals.

The Eastern Car Co. is building 1,000 four-wheeled freight cars for the French State Railways, the contract for which was made in June 1915. These cars will be of material to C.P.R. specifications, with the exception of the screw coupling, drawbar hook and all springs, which are to a modified French specification suitable for American practice, especially regarding tests. All rolled shapes of American standard are interchangeable with the French as far as possible, and the side end stakes and floor stringers are of French section. The siding, ending and sheathing for cabin is of yellow pine, and the floor and cabin framing of oak. The buffers are of cast steel, and the brake of the usual clamp type with counterweights operated from the cabin. Brakeshoes are of cast iron with trussed type brake beam; journal boxes of malleable iron with drop forged wedges, lead lined bearings and special oil lubricator. The wheels are of solid forged steel, interchangeable with the French wheels of spoked type, and are on French type axle with journals 140 by 250 m.m. Following are the chief dimensions:—

Length over buffers	27 ft. 8 5/8 ins.
Wheel base	11 ft. 9 3/4 ins.
Width over side steps	10 ft. 5 1/8 ins.
Length over end sills	23 ft. 11 3/8 ins.
Length inside	21 ft. 7 7/8 ins.
Width inside	8 ft. 2 7/16 ins.
Height from top of rail to top of cabin	11 ft. 4 1/4 ins.

Canadian Northern Railway Construction, Betterments, Etc.

The Toronto, Niagara & Western Ry. Co., which is the title of the company under which C.N.R. interests have power to build a railway from Toronto to the Niagara frontier, and generally westerly of Toronto, is asking the Dominion Parliament to increase its bonding powers to \$75,000 a mile, and to extend the time limit for the building of the following lines of railway: from Toronto to Hamilton, along Burlington Beach; from Hamilton to the International Boundary at Grand Island or Niagara Falls, N.Y., and from Hamilton to Windsor, Ont. Power is also asked to repeal the statutory prohibition of the use of steam for the operation of the railway.

Toronto Terminals.—A 32 stall locomotive house will probably be built at Leaside, Toronto, this year.

Canadian Northern Ry.—M. H. MacLeod, Chief Engineer and General Manager, is reported to have said in a recent interview that the work in contemplation during this year includes the keeping up of the line to the standard and the making of improvements at various points where necessary to meet increasing traffic necessities. Track will probably be laid on several branches where grading has been completed, but it is not likely that any new grading will be done.

The Canadian Northern Alberta Ry. has been granted power by an order-in-council to occupy a portion of the bed of the Athabaska River in the n. 1/2 of sec. 1, Tp. 51, range 26, west 5th meridian, for building a bridge across the river.

Vancouver Terminals.—Negotiations are in progress between the C. N. Pacific Ry., the Great Northern Ry., the City of Vancouver and the British Columbia Government respecting the provision of joint terminals on the reclaimed False Creek flats, Vancouver. The city wants immediate progress to be made in accordance with the terms of the agreements with the two railway companies. The G.N.R. has filed its independent plans under the agreement, which the city and the B. C. Government do not consider to involve the expenditure promised. The C.N.P.R. has agreed to accept the new frontage line for its building, which is not the same as that on which the G.N.R. proposes to build. With the city pressing the companies to build, and the refusal of the B. C. Government to endorse the G.N.R. plans, it is thought that some definite action will be taken in the direction of the provision of a joint station which will suit the conveniences of the companies, with the requirements of the city as to the frontage line, and give the full value demanded by the agreement. M. H. MacLeod, Chief Engineer and General Manager, C.N.R., is reported to have said in Vancouver, Feb. 15, that while the company is prepared to go ahead with the work necessary to fulfil the terms of the agreement, it is undesirable from many points of view to abandon the project of a union station.

M. H. MacLeod, General Manager and Chief Engineer, C.N.R., had an interview with the Mayor of Vancouver Feb. 12, when he discussed the question of station building, dealing with the question of a separate building, and a joint building with the Great Northern Ry. The plans for a separate station are estimated to cost \$1,000,000 to carry out, while those for the union station would involve the expenditure of \$1,500,000. It is claimed that the adoption of the plans for a joint building will not interfere with anything

the Great Northern Ry. is planning at present, except setting the frontage line further back from Main St., than that company's plan shows. The plans were discussed by the city's railway and bridge committee on the same day, and by the City Council on Feb. 15, representatives of the Vancouver Board of Trade being present at the meeting. Further consideration is to be given to the matter.

Lines on Vancouver Island.—The Minister of Railways for British Columbia has authorized the making of a temporary level crossing for construction purposes over the Victoria & Sidney Ry. at the north end of the Saanich Peninsula near Bazar Bay, and another one across the British Columbia Electric Ry. at mileage 17.9 north of Tripp station. These two points are almost close together.

Material and supplies for tracklaying on the Victoria-Patricia Bay line have

been delivered in considerable quantities at Victoria, but tracklaying had to be put off on account of the heavy snowfalls at the end of January and in the early days of February. It is expected that a real start will be made with the work in March.

Plans and specifications for the car ferry slips and wharves at Patricia Bay, and for the temporary transfer slips at New Westminster, were given contractors proposing to tender for the works on Feb. 16.

We are officially advised in regard to a press report that the company was surveying a route for a line from Alberni to Nootka Sound, 15.6 miles, that this line was run two years ago, and that the distance between the two points is 160 miles. No other survey work on Vancouver Island is at present contemplated. (Feb., pg. 54.)

Causes and Preventatives of Heaving Track.

By J. W. Powers, Supervisor, N.Y.C. & H.R. Rd.

The season is at hand when trackmen on practically all roads situated in latitudes where snow and ice are formed, are troubled more or less with heaving roadbed, causing more or less serious defects in surface and line of track, the extent of damage depending on the condition of roadbed as to ballast and drainage. Heaved track is one of the most annoying things and is sometimes the direct cause of broken rails and occasionally of derailments and wrecks.

The cause of heaving roadbeds has been discussed and explained on several occasions but the cause and knowledge of how to prevent same cannot be disseminated too profusely. When water freezes it expands, which means that if one cubic foot of water freezes the resulting ice occupies a space considerably larger than that of water. This takes place when wet soil freezes. Each particle of water expands and takes up more room. Considering these actions of water in connection with track work, it is easily seen how a roadbed soaked with rain will heave when it freezes. The particles of water as they turn to ice expand and since the least resistance is upward, the roadbed raises bodily. If this raising was perfectly uniform it would not be of much consequence, since it would just raise the level of the entire line. As a matter of fact the heaving takes place in a very irregular manner, due to the greatly varying proportion of water in the roadbed and also depending on the depth to which the frost penetrates, the drainage and the amount and kind of ballast.

Clay, on account of its great capacity for holding water, is about the worst material of which a roadbed can be constructed. Hence the composition of the roadbed and ballast, together with proper drainage, is an important factor affecting the heaving of track.

It is not an unusual occurrence when filling up openings, such as culverts, trestles and tops of arches, which are often substitutes for iron bridges, to have the filling made with cinders or gravel. Sometimes this material is several feet deep, and as a result of its porous condition it will not heave in proportion to the track each side of same, which oftentimes consists of clay, making it necessary to shim where openings were filled. This could be avoided by using material to fill the opening similar to that used on each side of same. Another mistake which is sometimes made by the use of clay when

strengthening shoulder on fills, is allowing the clay to raise higher than the sub-grade, which is often done to save ballast, but as a result the drainage is retarded and forms a ditch under the track, as dense soil will not allow water which falls on track to pass off freely. Consequently clay should not be placed above sub-grade when track is ballasted with more porous material. It is a well known fact that loam is better ballast than clay, sand better than loam, gravel better than sand and broken stone better than gravel, as a preventative for heaving, due to the fact that these materials in the order named are more porous. This provides room for water to expand as it freezes, with the result that heaving is either not noticeable at all or only to a slight extent. Another important reason is that these materials let the water pass through quickly, thus diminishing the amount of water in the roadbed and thereby lessening the tendency of the track to heave.

Where there are wet clay cuts it may be necessary to cut out the clay down to the frost line and fill in with a material like gravel or cinders; also tile drains should be laid so as to carry off the water as quickly as possible. The remedy for heaving may be readily found after its causes are thoroughly understood. The preventative should be in two directions, namely, reduce the amount of water in roadbed to a minimum and use ballast which is sufficiently porous to provide room for freezing water which cannot be entirely eliminated by drainage. The importance of good drainage cannot be overestimated and the further water is removed from track and the sooner it can be diverted, the more stable will become the roadbed. A practical illustration of this occurs during a wet season, while poorly drained sections of roads are troubled with bad track, mud slides and washouts. A mud ballast track can even be made good by keeping water away from it, while rock ballast will not prove satisfactory unless properly drained. The most important work then, in connection with general track work, consists in keeping the roadbed as dry as possible.

As already referred to, good drainage obviates the necessity of shimming. There are various methods of shimming, many of them being good and safe, but it should be the practice to shim according to well defined methods governing such work. Whatever method of shim-

ming is employed it should never be at the expense of safety. The cost of material for shimming, such as wood, frost spike, braces, etc., together with the labor of inserting, renewing and removing shims, is very expensive on some railways and as the work is only temporary, it might be considered a waste of money and material and if the expense chargeable to this work was spent for ballast or to improve drainage, it would in a short time eliminate the necessity of shimming and provide better and safer track.

The probability of accidents, as already referred to, is greatly increased on account of heaving and shimming. As it is at this season of the year more than at any other, the duties of the track forces are of the most exacting and vigorous kind. This is particularly true in reference to protection of the traveling public, and anything accomplished to eliminate the liability to accident, we consider a step in the right direction. Hence the importance of good ballast and drainage which will permit trackmen to devote more time to other duties of equal importance, as for example snow storms which close up cuts in certain portions of the road, snow and ice which have packed solid in road crossings, frogs, switches and guard rails and which keep trackmen constantly on the alert to guard against accidents. Then again occasional warm rains or spells of warm weather fill the ditches with melted snow with little chance to run off. In yards the water formed during the day freezes about the switches during the night, causing much work keeping them in usable condition, and as the melted snow raises the water in streams, causing the ice to break up in the rivers and jam against piers, bridges and trestles, frequently damaging or even carrying them away.

Aside from these points, nearly every section has its own special features which have to be closely watched to avoid accidents to trains. For instance, where water tanks, water pans, interlocking plants, etc., are located, it requires careful watchfulness on the part of trackmen to prevent accidents at such points and shows the necessity for each foreman to study his surroundings carefully in order to best meet the emergencies which may arise, as it rests with the foreman to combat all of these elements and to entirely eliminate the possibility of damage and consequent danger. Thus it is seen that the proper protection of the traveling public depends upon the intelligence, ability and close attention to duty of the track forces who on numerous occasions go many hours without food and sleep when the safety of human lives requires such services.

Not many realize, as they rest on the luxurious cushions of parlor cars and speed along over smooth track at the phenomenal speed of 60 to 80 miles an hour on a cold stormy night, of the hard work, exposure and worry this comfort and safety of themselves has caused the trackman, whose greatest reward is in the knowledge that he has performed his duty faithfully. A little thought on the subject of the duties of trackmen will convince the most skeptical of the burden which rests upon the trackmen and the importance of the work they perform. Any neglect or oversight on their part may be the cause of serious consequences. Therefore they must be eternally alert and vigilant, even to the extent of supplying the deficiencies of men in other departments. Maintenance of Way Bulletin.

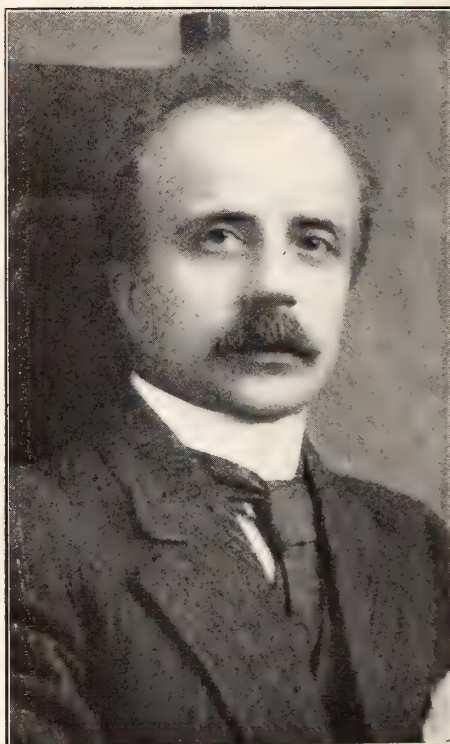
The Audit Department, and its Relationship to Railway Organization.

By W. C. Blake, Chief Clerk to General Auditor, Canadian Northern Ry., Winnipeg.

It is an extremely difficult task to attempt even merely to outline in one brief paper the relationship that the audit department bears to railway organization. It is a department as comprehensive as all of the other departments which go to complete the whole, consequently within its own sphere of operations it is subdivided into various divisions, thus we have an auditor of agencies, auditor of freight and passenger receipts, auditor of stores and mechanical accounts, auditor of disbursements, and car accountant, all reporting to the general auditor in pretty much the same manner as the heads of the other departments report to the general manager, with this difference, that the general auditor reports to the comptroller. On lines which control their own commercial telegraphs, the telegraph receipts are taken care of usually by the auditor of freight receipts, and in cases of sleeping and dining cars, by the auditor of passenger receipts.

First of all, why is it that the auditor of all the officials is, besides the treasurer, the only one not reporting direct to the general manager? It is because the duties of his office require that he should be free from local influences, in other words, through the comptroller he is responsible to the directors that every dollar due the company is collected and properly applied, and also that no money has been paid out without the proper authority for such expenditure. It is his prerogative to prescribe in what particular manner the books or records of the company shall be kept, and, being free from local influences, any recommendations he may have to make, as to the removal from the service or otherwise of incompetent servants, have more weight, and if they are worthy of consideration are promptly acted upon. To illustrate this let me record the experience of one of the pioneers in railway accounting on one of the trunk lines to the south of us. The line in question had suffered considerably from defalcations on the part of those to whom the collection of the company's moneys was trusted; he was sent for by the executive, and, after an expression of annoyance and apprehension, was asked who was responsible for the collection of the company's receipts. He replied, so far as he could ascertain, no one. The treasurer, traffic department, general manager, through his superintendent, together with himself, exercised a joint supervision, but the local superintendent, who was responsible for the physical operations of the road, had immediate charge, and reserved the right of exercising his discretion about dismissing or removal to inferior positions those caught stealing the company's moneys. They all acted intelligently in the discharge of their respective duties, but neither one nor the other was prepared to assume the responsibility, and consequently either acted hesitatingly, or more frequently not at all. The interview closed by an order being issued that the accounting officer thereafter had sole charge of the company's accounts and the collection of its receipts, and that it was the duty of all officers and agents absolutely to conform to his regulations in regard thereto. This is the basis as in existence at the present day.

In the administration of a railway it is as impossible for one man to be in the position of an oracle, that is, one whose mind is so forward as to be able to conceive and direct all the multifarious branches that exist in the operation of the road, as it is for a professor to say he can be an authority on law, medicine, philosophy, astronomy, and all the other sciences, therefore the auditor is the man who having made his accounts his study performs his work with that object in view. As I said at the start, our department is subdivided, each one whilst working along different lines reports to one head, with the one object in view. The auditor



P. 154.
W. C. Blake.
Chief Clerk to General Auditor, Canadian Northern Ry., Winnipeg.

of agencies is responsible for the accounts of the different stations and agencies along the line, he has a number of travelling auditors up and down the line visiting and checking up the accounts as they actually exist in the agent's books, he sees that records, etc., are kept in such a manner as to be intelligent, and that any information required can be obtained readily, he checks his cash transactions closely, and generally makes an opportunity of finding out the habits of those entrusted with the company's funds, etc., for instance, a cashier or agent who handles money and spends his time when off duty at an hotel bar or frequenting pool rooms, is not calculated to inspire his higher officials with much confidence. The travelling auditor also reports on the general condition of the stations and buildings, which report is sent to the local superintendent, and coming from what can be termed an independent source is usually of value. His reports on the accounts go to the auditor of agencies, by whom they are criticized and

compared with balance sheets as received from the agents themselves; the balance sheets are in turn checked up with report of remittances from the treasurer's department, as also with the result of the checking of reports and abstracts received by the auditor of freight and passenger receipts. The agents' credits are also checked to see that all cash they have paid out is for legitimate items and properly authorized; their outstandings are scrutinized closely, and any items outstanding for which they have not freight on hand to cover are rigorously followed up.

The auditor of freight receipts and of passenger receipts is sometimes one and the same person, and as their duties are somewhat along the same line they can be treated of together. The waybill is the foundation upon which the freight auditor works; the system differs on almost every road, but the results obtained are the same. The waybill covers the movement of freight traffic, it contains all information necessary for the identification of the freight, who shipped it, to whom it is consigned, what it consists of, weight rate upon which its charges are assessed, and so forth. The agent issuing it hands it to the conductor of the train carrying the goods, in fact a conductor is not allowed to handle freight unless he has a waybill. On arrival at destination it is turned over with the freight to the receiving agent, who checks it up in every detail as to quantity, marks, weight rate calculations, etc., making notations as to any discrepancies. If it is a prepaid shipment, and there is an undercharge on it, he collects the difference from the consignee before delivering the goods. On some roads, after the waybills are entered on the agents' abstracts the originals are sent either daily or weekly to the auditor of freight receipts, and the rates and extensions are again checked; on other roads they are filed away by being pasted in books in which case the agent issuing the bill forwards an impression copy (carbon or tissue) to the auditor, where the same process of checking is performed as when the original waybill is sent to him. At the end of the month abstracts, both forwarded and received, are checked and balanced in weight of freight, charges to collect, advances, pre-pays, etc., and on some roads they are then summarized in that office and sent to the auditor of agencies as the basis of checking with station balance sheets. As regards freight for a point destined on another company's line, settlement between companies can be made either between agents, on what is known as the junction settlement plan, where settlements are made mutually between agents at junction points, and draft drawn on whichever company the balance is due from, or by what is known as the audit office plan. When the latter system is adopted the receiving road is the principal factor in the handling of the waybill and accounting for it, all balances being drawn for on the 25th of the month following. Where there is no statistical department, other information, such as tonnage, movement, description of freight, etc., is got out to be used later, or when compiling the statistics required by the government, or for the company's annual

report. With passenger traffic, the system is much the same, only the ticket forms the basis on which the work is performed, instead of the waybill. Agents are required to report their tickets consecutively, the closing number from previous month is carefully recorded and they are promptly charged up with tickets not promptly. As all tickets are turned in by conductors, they are sorted and checked up with report of tickets sold as sent in by agents, as also with the conductors' reports of tickets issued by them. Through or interline tickets are handled much after the same manner as through freight traffic, with the exception that all settlements between companies are on the audit office plan. Baggage, milk, sleeping car, and dining car receipts are checked up on the same principle from the reports of agents, conductors, porters or stewards. The system in this respect differs from that in vogue in the United Kingdom, where there is no such a thing as a coupon ticket, or junction settlement. All settlements between companies are made through the Railway Clearing House, and no matter how many roads you travel over you only receive a card ticket. Thus, if you are travelling from London to Edinburgh, say via the east coast route, your ticket would read from London (King's Cross) to Edinburgh (Waverley), but to reach there, between London and York, you would travel over the Great Northern, the North Eastern, and the North British, your only transportation being a card the size of an ordinary card ticket as used in this country. The working of the Railway Clearing House would form a most interesting topic for discussion and comparison with our methods.

The Departments whose workings I have thus briefly covered, from the amount of detail required, engage possibly the largest clerical staff of any department, owing to the amount of detail required.

The auditor of disbursements is neither a divisional nor departmental accountant, each division or department should have its accountant to satisfy its superior officer as to the expense of his own particular branch. Our position is to review the work of the accountant in so far as his distributions, etc., are concerned, thus as it were forming a sort of court of review. Our present state of efficiency has more or less evolved by the lapse of time since the introduction of railways. In their infancy, the auditing department was, as it exists today, unknown, the accounts of the company were crude and in the majority of instances much of a one-man concern. As railways multiplied and commercial interchange was established, more elaborate systems were required than those kept by each department, as at that point they ended, a summary of the whole being presented to the directors and shareholders at the end of the year. As they so appeared they were formally audited by chartered accountants much as they are now, but when it came to a question of comparison as to expenditures of say maintenance of bridges, or equipment for one period against another, or one division against another, it was not forthcoming, and when asked for from the superintendents, the reply usually was, "We are not experts in the accounting department, and only keep such records as enable us in a rough way to show what we are doing." It goes without saying that such a situation could not last long, the result being that a department entirely separate and distinct from those already existing was

created to attend to this business, and not yearly nor half yearly, but month by month, submit for the directors such a tabulated statement as would show them at a glance how their road was progressing, or otherwise.

The auditor of disbursements must satisfy himself that expenditures for wages, material or other causes have been made on the requisition of the proper authority and charged to the proper accounts. We will assume the road has been constructed by capital raised by any of the various means for that purpose, the traffic revenue I have already dealt with, the maintenance of the road, and its operation must be met from the revenue derived, stores and supplies have to be purchased, and as the road is not run as a family institution nor for charitable purposes, economy with efficiency is the motto, and you can only obtain that end when an independent check is made of the working of each department, so as to arrive at the actual result as compared with previous periods. This perhaps will only appeal to my hearers as to the result of operation as a whole, but how does it affect us individually? How far am I concerned with the audit department? One or two illustrations will I think suffice for this, and these I may say are not what may be termed academic, but from my own experience. A passing track has been authorized to be put in at a certain mileage, requisition has been made on the storekeeper for spikes, bolts, switches, etc., and in due time they arrive on the section where the track is to be put in. For certain reasons, the track is not proceeded with. Eight or nine months afterwards, when it is decided to go on with the work, another requisition is put in, and another set of material sent out for the job, but what has happened to the first lot? Investigation will show that the material has been taken away and used, goodness knows where, for renewals, and neither section foreman, roadmaster nor anyone else thought for one moment it was necessary to notify headquarters that such a misappropriation had taken place. This is only one instance of many of a similar nature, and it illustrates the fact that maintenance of that particular section has been maintained at the expense of new work, for new work is not a charge against operating expenses, and when the material is taken for other than the purpose it was ordered, the accounts should have been promptly adjusted without entailing a volume of correspondence, tracing, etc., to get it done.

Occasionally the auditor is notified that a tool house, oil house, or coal shed has been erected at a certain place, and to effect the necessary insurance. He can find no record of any authority having been given from the general manager's department for the work, nor any requisition for material. He, however, discovers after a lot of correspondence, that the building has been erected from left over material from other structures. The theory of using up material left over may be and no doubt is a good one, but it is bad policy and management to erect a tool house or any other structure at the expense of a water tank say some thirty miles away, and probably the cost of the water tank was a charge against insurance, as its predecessor was destroyed by fire. Instances such as these should go to show why the audit department insists upon minute details as to distribution of not only labor and material, but what becomes of what is left over. This information is rarely, if ever, got from divisional

or departmental accountants, who give for their excuse:—"The supervisor or roadmaster did not advise me." This is one more instance of the old saying that the smart railway man is he who can shoulder the responsibility for his own deficiencies on to someone else.

To show that such discrepancies are not confined to any one branch of railroadng, I have a very vivid recollection of an official car being ordered to the shops for remodelling. It was of rather ancient date, and to bring it up to standard a large sum was to be spent on it, new lighting fixtures and internal fittings were ordered and delivered, a period of depression set in, and the car was in the shops for some six months or more, before it was decided to proceed with the work, and it was then found necessary to order a new set of fixtures, etc., those already supplied having been used on sleeping and day cars for renewals. Material ordered for specific work should be used for that work only, and not for any other purpose, except on order from the official ordering in the first instance, in which case the accounting department would have a clear record, and could adjust its charges accordingly.

Railway companies pay out a considerable amount each year for grain doors. In the west they are generally purchased ready made, and are calculated to fill the purpose for which they are required. They were never intended for flooring for a stock yard or building a section foreman's pig pen, neither were they intended to be used for the construction of a coal bin for the station agent, but still they are used, and when a shortage of doors is reported at the end of the month, the inquisitive auditor has to get busy to locate the missing doors, usually at some expense. Again, the majority of employees belong to one of the various brotherhoods which are governed by schedules, framed so as to be as incapable of interpretation in diverse ways as an act of parliament, and no matter how fine the line is drawn, there is always some one trying to step over on to the other side. So long as human nature exists, I presume it will always be so. To guard against this, as in all other infringements, the management has to rely on its auditing department. When question of interpretations of certain rules are required they are obtained from the proper authority, and when thus armed, the auditor gets after the party concerned through the head of his department.

In the operating accounts of a railway on this continent there are 182 sub-accounts, divided up as follows:—

Maintenance of ways and structures.....	79
Maintenance of equipment.....	36
Traffic department.....	8
Transportation rail and water lines.....	42
Miscellaneous operations.....	5
General administrative.....	12

182

These have all been agreed upon between the railways, the Dominion Department of Railways, and the Interstate Commerce Commission. The text books covering these accounts are explicit and the auditor's duty is to see that all expenditures in connection with the operating are strictly in accord therewith, so that at the end of the month when the operating statement is submitted to the president, it will exhibit to him (or rather should do so) a correct statement as to what it implies. To arrive at this result, an independent body must analyze the accounts and distributions of the various departments, drawing attention to any irregularities that may appear, and

promptly object to any charges for work done without the proper authority on file. You cannot get these results in any other manner, and the knowledge that your work is going to be, as it were, overhauled by such analysis, has, or should have, a great tendency to cause others to keep within bounds. We do not profess or presume to be experts like tracklayers, carpenters and builders, machinists, engineers, or any of the other multitudinous trades and professions that find scope for their energy on the railway, but we are responsible to the directors to see that all expenditures made are covered by proper authority and charged to their proper accounts, and also that material is economically used and properly cared for. Our relationship to the various departments comprising the operation of the road is along those lines, to enable us to obtain the results required. To put the whole thing in a nutshell, suppose you give a contractor a contract to build a house, say for \$8,000; when he has finished, or even before he has done so, you find it is going to cost you nearer \$10,000 than \$8,000. What do you do? You go right down into details to see where the fault lies, and even if your house is built for the \$8,000, you satisfy yourself that you are getting value for your money before paying. That is the position of the auditor. He is the one to see that value has been received for all of the company's funds expended, and that distribution has been made in accordance with government requirements.

In this department, to which is closely allied the stores and miscellaneous accounts, travelling auditors are employed on some roads, in fact, should be on all, whose duty is to visit all divisional points and storehouses, check up material and report as to condition of accounts, material and stock, and as to whether the same is properly cared for. Occasionally these men, instead of travelling on regular trains, cover the ground by motor car, and thus have an opportunity to see how section material is taken care of along the line, constituting as it were a check on the interest the roadmaster is taking in the care of the company's property entrusted to his keeping.

In this paper I have endeavored to deal with one of the principal points connected with the audit department. Of all the departments which comprise the whole in regard to railway management, so far as knowledge of our brother employes with whom we have to work, we are least known in person, and I think the most misunderstood. The comptroller of one of our large trunk lines to the south says it is because we are located usually on the top floor at headquarters, and to get there would necessitate a special journey, which is not considered worth while. When heads of departments, roadmasters, supervisors and others who report to the audit department, visit headquarters, it would, I think, be worth their while, occasionally to make the trip on the elevator or ascend the winding staircase to make the acquaintance of those whom hitherto they have known by correspondence only. It is true the natural instinct with mankind is to feel relieved when the auditor has finished his duties, and taken his departure. The audit department, I am glad to be able to say, has not now the reputation of being an asylum for useless and aged employes of other departments, and round men to fill square holes sent to officials for positions by well meaning friends with begging letters, and so far as our dealings with other departments are concerned, our interests in the wel-

The Canadian Pacific Railway's Roll of Honor.

C. H. Buell, Staff Registrar and Secretary, Pension Department, C.P.R., has issued list 8, which is prefixed as follows:—"Several thousand officers and employes of this company enlisted for active military duty with the Canadian Expeditionary Forces, and the majority of them are now in Europe, bravely battling for Canada and the Empire. As particulars of army reservists are not available, these lists of those who have given up their lives for their country or been wounded in action are necessarily incomplete, and do not therefore indicate fully the extent to which the Company's officers and employes have participated in the great struggle."

Ackerley, Percy	Clerk	Angus	Wounded
Allen, Charles T.	Freight checker	Montreal	Wounded
Blackett, William C.	Stenographer	MacLeod	Killed in action
Buchan, John	Loco. fireman	Ogden	Killed in action
Carr, Frederick	Apprentice	Quebec	Suffering from shock
Clent, George	Shed clerk	Regina	Killed in action
Clough, B. G.	Elevator boy	Vancouver	Wounded
Cummings, John	Painter	Winnipeg	Wounded
Daniels, F. W.	Chief clerk	Revelstoke	Wounded
Deblois, Joseph	Loco. engineer	Quebec	Wounded
Duff, John	Fitter	Ogden	Died of wounds
Gay, Aubrey H.	Loco. engineer	Calgary	Wounded
Geddes, Percy M.	Waiter	Montreal	Believed drowned
Glithero, John H.	Cabinetmaker	Angus	Wounded and prisoner
Goulet, Emanuel	Helper	Quebec	Wounded
Henry, William	Porter	Pt. McNicoll	Killed in action
Hodge, Robert S.	Hostler	Winnipeg	Died of wounds
Johnson, Lacey A.	Draughtsman	Angus	Died of wounds
Lacey, Richard	Watchman	Fredericton	Wounded
Laurence, Benjamin	Constable	Fort William	Wounded
Marr, Henry E.	Clerk	Keewatin	Wounded
Metherall, Percy	Trainman	Brit. Col. Dvn.	Wounded
Middleton, James	Loco. fireman	Medicine Hat	Wounded
O'Connell, W.	Clerk	Toronto	Killed in action
Pratt, Richard B.	Freight porter	Medicine Hat	Wounded
Pushie, William J.	Loco. engineer	Medicine Hat	Wounded
Robertson, Oliver	Helper	Angus	Killed
Saxelby, Walter	Ass't. accountant	Fort William	Killed in action
Shaw, Francis W.	Stenographer	Montreal	Wounded
Skinner, Sidney E.	Baggage checker	Winnipeg	Wounded
Sutherland, Benjamin	Loco. engineer	Kenora	Killed in action
Syder, James	Clerk	Montreal	Died of wounds
Thomas, George W.	Brakeman	MacLeod	Wounded
Wheelhouse, C.	Helper	Glen Yard	Wounded
Wood, Herbert	Template maker	Angus	Wounded

The following casualties to members of our European staff on active service have also been reported:

Candeland, William	Clerk	Liverpool	Killed in action
Harden, Robert J.	Junior clerk	London	Wounded
Moore, Edward G.	Clerk	London	Wounded
Paterson, John S.	Clerk	Liverpool	Killed in action
Rosci, Joseph	Clerk	Antwerp	Wounded
Stannard, Herbert J.	Clerk	London	Wounded

fare of the operation of the road are as keen as theirs, and if there is any misunderstanding, let us know what it is, and have it put right. Neither one of us can claim to know it all, and our little differences can assuredly be adjusted. If, therefore, the observances I have made have a tendency to facilitate the working between other departments and ourselves, to remove the hitherto imperfect knowledge of our requirements, and to show why we ask for certain details, the preparing of this paper will not have been in vain.

(The foregoing paper was read before the Western Canada Railway Club recently.)

An Amusing Contretemps.—As the chief guest at a public dinner at St. John, N.B., recently, F. P. Gutelius, General Manager, Canadian Government Railways, in responding to a toast to himself, spoke enthusiastically on the work accomplished on the Government railways, and optimistically as to the future. His speech was immediately followed by another toast, under the title of "Castles in the Air."

Jno. Martin, an Allan Line Steamship Co's official for 40 years, died at Liverpool, Eng., Feb. 24.

British Columbia Southern Ry. Land Grant.—The Imperial Privy Council on Feb. 6 gave judgment in the action of the British Columbia Government against the late F. A. Heinze's estate respecting taxes on the British Columbia Southern Ry. land grant. The grant covers some 600,000 acres in the West Kootenay district. The railway was built and passed by purchase to the C.P.R., and a few years ago that company forced a division of the land grant, upon which the Government sought to levy taxes on the part remaining in the hands of the Heinze estate. The matter went through various courts until now the Privy Council has decided that the land is to be taxed.

NOTICE is hereby given that the Annual Meeting of the Shareholders of the Victoria Rolling Stock & Realty Company of Ontario, Limited, will be held at the offices of Messrs. Osler and Hammond, 21 Jordan Street, Toronto, on Wednesday, March 1, 1916, at twelve o'clock noon, for the reception of the Annual Report and election of Directors for the ensuing year.

By order,
G. T. CHISHOLM,
Secretary.

Toronto, February 16, 1916.

Traffic Orders by Board of Railway Commissioners.

Carload Minimum on Bricks.

24674, Jan. 22. — Re complaint of Western Retail Lumbermen's Association of Canada against increases by railway companies in carload minimum on brick over their lines in Western Canada, from 40,000 to 50,000 lbs. Upon hearing the matter at Winnipeg, May 25, 1915, the Western Retail Lumbermen's Association of Canada, and the Canadian Pacific, Canadian Northern, and Grand Trunk Pacific Railway Companies being represented, and upon reading the further submissions filed, it is ordered that the complaint be dismissed.

Charges for Heated Refrigerator Cars.

24680, Jan. 27. — Re complaint of Fruit Growers' Association of Ontario against proposed tariffs of the Canadian Pacific, Grand Trunk, Canadian Northern and Toronto, Hamilton and Buffalo Railway Companies, making charges for the use of heated refrigerator cars. It is ordered that the following tariffs be suspended, pending hearing at Ottawa, on Feb. 8, Canadian Pacific, C.R.C., no. E-3093; C.R.C., no. E-3094; Canadian Northern C.R.C., no. E-728; C.R.C., no. E-729; Grand Trunk, C.R.C., no. E-3319; C.R.C., no. E-3321; Toronto, Hamilton and Buffalo, C.R.C.; no. 1080; C.R.C., no. 1081.

Unloading Empty Milk Cans.

24686, Jan. 26. — Re application of milk shippers for a reconsideration of order 15413, Sept. 26, 1911, requiring, inter alia, that shippers supply a man to assist in unloading empty milk cans, and the question of the general handling of the same. And re the question of a general order fixing the minimum number of milk cans, or minimum carload rate, necessary to entitle a shipping station to a separate car. Upon hearing the application at Ottawa, Oct. 19, 1915, the Montreal Milk Shippers' Association, the Canadian Pacific and Grand Trunk Railway Companies and New York Central Rd. Co. being represented at the hearing, W. F. Empey appearing in person, it is ordered that the application be refused.

Charge For Diversion of Livestock

24714, Feb. 9, the complaint of A. H. Mayland of Calgary, Alta., against "completion of loading charge" and "diversion" charge made by the C.P.R. on shipments of pigs or on livestock shipments billed through Calgary. Upon hearing the complaint at Ottawa, Jan. 18, 1916, the Montreal Board of Trade and the C.P.R. being represented at the hearing, and the railway company, in the Board's opinion, having established that the charge is justifiable—it is ordered that the complaint be dismissed.

Interchange of Freight at North Bay.

24694, Jan. 29. — Re application of Canadian Northern Ry. Co., under sections 317 and 334 of the Railway Act, for an order directing the Grand Trunk Ry. to interchange freight traffic with the applicant company at North Bay, on an equality with the C.P.R. Co. Upon hearing the application at Ottawa, Jan. 25, 1916, the applicant company, the Grand Trunk Ry. Co., the Canadian Pacific Ry. Co., and the Quaker Oats Co. being represented, it is ordered that the Grand Trunk be directed to concur in joint freight tariffs to be forthwith published and filed by the applicant company to apply on grain and grain products, in carloads, from Port Arthur, Fort William and Westfort, Ont., to Grand Trunk stations, via North Bay, Ont., the joint

rates to be the same as those published and filed by the C.P.R. Co. from the said points of shipment to the said destinations, the said grain to be accorded the milling-in-transit privileges pertaining to shipments received by the Grand Trunk from the C.P.R.; the Grand Trunk proportion of the joint freight charges, when prepaid, to be paid to the Grand Trunk by the applicant company at North Bay upon the transfer of the car containing the grain or grain products in each case.

Sale of Canadian Northern Tickets at Toronto Union Station.

24706. — Re application of Canadian Northern Ry., for an order amending 24462, Nov. 19, 1915, directing the Grand Trunk Ry. Co. to sell tickets for the applicant company's and exchange the applicant company's tickets for orders, the applicant company to pay one-third of the cost of operating the ticket office, including salaries and actual disbursements, but not rental charges. Upon hearing the application at Ottawa, Jan. 25, 1916, in the presence of counsel for the railway companies interested, and what was alleged, it is ordered that the operative part of order 24462 be rescinded and the following substituted therefor: That temporarily, and for a period of six months from the date of this order, during which time the G.T.R. shall keep an account of the cost of operating and maintaining the ticket office and the amount chargeable pro rata against the applicant company on a wheelage basis, exclusive of rental charges, the G.T.R. be directed to sell tickets for the applicant company and exchange the applicant company's tickets for orders, the applicant company to pay to the G.T.R. in advance \$25 a month.

Rates from Eastern Canada via Fort Frances.

24724, Feb. 14. — Re complaint of Canadian Northern Ry., against the cancellation by the Grand Trunk Ry. of rates from points in Eastern Canada to stations in the Canadian Northwest, via Fort Frances, Ont. Upon reading what has been submitted, and in accordance with the understanding reached at the sittings in Ottawa, Feb. 8, 1916, that certain joint rates were to remain in effect pending arrangements between the Canadian Pacific, Grand Trunk, and Canadian Northern Railway Companies, it is ordered that the proposed cancellation of joint rates from Eastern Canada to points in Western Canada, applying via the routes specified below and published in Supplement 8 to G.T.R. Tariff C.R.C. no. E-2962, and Supplement 18 to G.T.R. Tariff C.R.C. no. E-2977, issued to take effect Feb. 15, 1916, be suspended until further order.

Canadian Northern via Duluth, Minnesota, Duluth, Winnipeg and Pacific Ry., and Fort Frances; via Duluth, Minnesota, Duluth, Missabe and Northern Ry., Duluth, Winnipeg and Pacific Ry., and Fort Frances; via Superior, Wisconsin, Duluth, Winnipeg and Pacific Ry., and Fort Frances.

Grand Trunk Pacific via Duluth, Minnesota, Duluth, Missabe and Northern Ry., Fort Frances, Canadian Northern Ry., and Winnipeg.

Grand Trunk Pacific via Duluth, Minnesota, Duluth, Winnipeg and Pacific Ry., Fort Frances, Canadian Northern Ry., and Winnipeg, via Superior, Wisconsin, Duluth, Winnipeg and Pacific Ry., Fort Frances, Canadian Northern Ry. and Winnipeg.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, for Western Lines, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$1,206,100	\$321,000	\$285,100	x\$145,400
Aug.	1,192,800	354,000	238,800	x5,900
Sept.	2,014,500	1,358,000	661,600	1,300
	\$4,413,600	\$3,227,000	\$1,186,600	x\$79,300
Decr.	\$658,300	\$579,000	\$79,300	

x Decrease.
Mileage in operation at Sept. 30, 1915, 4,965, against 4,670 at Sept. 30, 1914.

Commencing with October, the figures show the earnings of the entire system, both eastern and western lines.

	Gross Earnings	Expenses	Net Earnings	Increase
Oct.	\$3,678,500	\$2,421,500	\$1,257,000	\$537,800
Nov.	3,535,200	2,323,800	1,211,400	618,400
Dec.	3,435,600	2,233,500	1,202,100	768,900
	\$10,649,300	\$6,978,800	\$3,670,500	\$1,925,100
Inc.	\$4,033,400	\$2,108,300	\$1,925,100	

Approximate earnings for January, \$2,086,800, against \$1,439,400 for Jan., 1915, and for three weeks ended Feb. 21, \$1,441,500, against \$1,155,800 for same period 1915.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$7,895,375.47	\$5,094,972.35	\$2,800,403.12	\$978,042.71
Aug.	8,801,451.52	5,359,136.80	3,442,314.72	79,157.02
Sept.	10,273,165.45	5,527,864.81	4,475,300.64	378,252.25
Oct.	13,433,206.88	6,863,780.29	6,579,426.59	3,258,105.79
Nov.	13,351,283.51	6,996,870.48	6,354,413.03	3,710,340.86
Dec.	12,705,673.45	7,003,351.97	5,702,321.48	3,502,797.67
	\$66,170,161.84	\$36,845,976.70	\$29,324,185.14	\$9,950,610.88
Inc.	\$10,532,038.26	\$581,427.38	\$9,950,610.88	

Approximate earnings for January, \$3,880,000, against \$5,908,000 for Jan., 1915, and for three weeks ended Feb. 21, \$5,881,000, against \$4,688,000 for same period 1915.

Grand Trunk Railway Earnings.

The following figures show the earnings of the G.T.R. (including the Canada Atlantic Ry.), the G.T.W.R. and the D.G.H. & M.R., for January, compared with those for January, 1915: —

	1916	1915	Increase
G.T.R.	\$3,341,263	\$2,661,080	\$680,183
G.T.W.R.	689,786	559,938	129,848
D.G.H. & M.R.	229,279	192,131	37,148
	\$4,260,328	\$3,413,149	\$847,179

Approximate earnings for three weeks ended February 21, \$2,858,616, against \$2,426,849 for February, 1915.

Grand Trunk Pacific Railway Earnings.

The approximate earnings for the Prairie Section, 916 miles, for January, were \$314,344, against \$294,000 for January, 1915.

Canadian Locomotive Co., Ltd.—Consequent on the resignation of A. W. Wheatley, Vice President, to become President of the Lima Locomotive Corporation, F. G. Wallace, formerly of Pittsburgh, Pa., who has lived in Kingston for several years and is one of the Canadian Locomotive Co's directors, has been appointed Managing Director, and Wm. Casey, heretofore Assistant to the General Manager, has been appointed Manager.

Canadian Transfer Co., Ltd. The directors for the current year, elected at the recent annual meeting, are: C. C. Sells, Hugh Paton, G. R. Starke, Sir H. Montagu Allan and F. W. Molson. F. M. McRobie is General Manager and Secretary.

Canadian Exhibits in France. A London, Eng., cablegram says that three booths at the Lyons Industrial Exhibition have been taken by the C.P.R. The Canadian Consolidated Rubber Co. have engaged booths.

Mainly About Railway People Throughout Canada.

Sir Wm. Mackenzie, President, Canadian Northern Ry., and Lady Mackenzie left Toronto Jan. 21 for Winnipeg.

J. H. McKechnie, President, Canadian Consolidated Rubber Co., died in Montreal Feb. 8, of bronchial pneumonia.

M. W. Furlong, K.C., of St. John's, Nfld., who died at Montreal, Feb. 8, aged 53, was a director of the Reid Newfoundland Co.

J. H. Conklin, a member of the firm of J. D. McArthur Co., railway contractors, Winnipeg, died suddenly at Edmonton, Alta., Feb. 17, aged 74.

H. C. Rochester, Secretary to General Manager and Chief Engineer, Canadian Northern Ry., Winnipeg, has recovered after an operation for appendicitis.

A. Watt, District Locomotive Foreman, Grand Trunk Pacific Ry., Prince Rupert, B. C., was married at Winnipeg, Jan. 26 to Miss Jessie McMillan, of Magnetawan, Ont.

B. Winger, a G.T.R. Car Inspector, Stevensville, Ont., was killed Feb. 15 near Bridgeburg, Ont., by being run down by a train while riding on a motor car on an inspection trip.

A. Ferguson, a former station agent of the Great Western Ry., and G.T.R., at Brantford, Simcoe and other points in Ontario, died at Simcoe, recently, aged 82.

C. R. Morgan, City Passenger and Ticket Agent, G.T.R., Hamilton, Ont., has enlisted as a private in the 120th city of Hamilton Battalion, for overseas service.

Albert H. Scherzer, President, Scherzer Rolling Lift Bridge Co., was killed by falling down an elevator shaft in the Monadnock Building, Chicago, Ill., Jan. 28.

F. H. Phippen, K.C., General Counsel, Canadian Northern Ry., left Toronto Feb. 22 for Mexico, intending to be away about six weeks in connection with some of Sir Wm. Mackenzie's enterprises there.

F. P. Gutelius, M.Can.Soc.C.E., General Manager, Canadian Government Railways, was entertained to dinner at the Union Club, St. John, N.B., recently by a number of business and commercial men.

F. C. Salter, European Traffic Manager, G.T.R., and Canadian Express Co., London, Eng., underwent an operation for abdominal trouble, Feb. 7, and is reported as progressing satisfactorily.

Mrs. F. M. Spaidal, who died suddenly at Brockville, Ont., Feb. 16, was widow of the late F. M. Spaidal, General Superintendent, Quebec Division, Canadian Northern Ry., who died in Sept. 1915.

Mrs. McArthur, mother of J. D. McArthur, President, Alberta and Great Waterways Ry., Central Canada Ry., and Edmonton, Dunvegan and British Columbia Ry., died at Bainsville, Ont., recently, aged 98.

Hon. F. Cochrane, M.P., Minister of Railways and Canals, returned to Ottawa, Feb. 7, from a trip to Europe, in the course of which he visited a portion of the battlefield in Flanders, meeting two of his sons there.

E. J. Wearing, who has been appointed General Agent, G.T.R., Central Vermont Ry., and Canadian Express Co., Liverpool, Eng., was born at Birkenhead, and entered G.T.R. service in 1888, at Liverpool.

J. G. Taylor, General Superintendent, Saskatchewan Division, C.P.R., Moose Jaw, who has not been in good health for some time, has been granted leave of absence, and will spend the balance of the winter in the south.

Hon. George Riley, who died at Ottawa, Ont., recently, was born in St. Catharines, Ont., and settled in Victoria, B. C. in 1885, when he took service with the general contractors engaged in the construction of the Esquimalt and Naaimeo Ry.

Lieutenant J. E. Vaughan, 166th Battalion, who died at Toronto General Hospital, Feb. 7, after a few days illness, of pneumonia, was a nephew of R. C. Vaughan, Assistant to Third Vice President, Canadian Northern Ry., Toronto.

J. M. Gibbon, General Publicity Agent, C.P.R., Montreal, has written a novel, "Hearts and Face," dealing with the career of a young Scottish artist in London and Paris, and which is being published in London, Eng.

P. K. Manahan, who has been appointed Trainmaster, Pacific Division, Canadian Northern Ry., Vancouver, B. C., was, prior to leaving Saskatoon, Sask., where he had occupied a similar position, presented with a dining table and two leather covered chairs, by the local staff.

Duncan Macdonald, who died at Winnipeg, Feb. 2, aged 74, was formerly engaged in railway construction for several years, his last contract being on the Grand Trunk Pacific Ry., for a section between Portage la Prairie, Man., to near the Saskatchewan River, about 275 miles.

James Esslemont, Roadmaster, Vancouver-North Bend Subdivision, British Columbia Division, C.P.R., Vancouver, died there suddenly, Jan. 29, aged 54. He had served on the British Columbia Division for five years, and prior to that had been at other points west of Winnipeg, and at Fort William, Ont.

Hon. F. Cochrane, M.P., Minister of Railways and Canals, is suffering from a severe cold, and taking into account the fact that his health has not been good for some time, he has been ordered complete rest for a short time. Hon. J. D. Reid, Minister of Customs is acting also as Minister of Railway and Canals.

J. H. Plummer, President, Dominion Steel Corporation Ltd., controlling the Dominion Iron and Steel Co., the Dominion Coal Co., the Sydney and Louisburg Ry. and the Cumberland Steel and Coal Co., has retired from that position owing to ill health, and will in future act as Chairman of the Board, a new position.

E. H. Fitzhugh, formerly Vice President, G.T.R., and afterwards President and General Manager, Central Vermont Ry., and C. J. Crowley, M.Can.Soc.C.E., who was Resident Engineer on the G.T.R. at Toronto and afterwards at Detroit, Mich., some years ago, have established The Fitzhugh-Crowley Corporation, engineers, constructors and railway specialists, with office at 60 Broadway, New York.

A. L. Hertzberg, M.Can.Soc.C.E., Division Engineer, C.P.R., Toronto, was officially notified Feb. 17 that his son, Lieut. O. P. Hertzberg, of the 5th Battalion, Canadian Overseas Expeditionary Forces, had been slightly wounded in action. Another son, Capt. H. F. H. Hertzberg, of the Royal Canadian Engineers, was

wounded at the battle of Ypres, and a third son, Lieut. C. S. L. Hertzberg, of the Canadian Engineers, is also overseas.

M. J. O'Brien, contractor, of Renfrew, Ont., and President, Canada & Gulf Terminal Ry., has placed his yacht at the Minister of Militia's disposal, and on the opening of navigation it will cruise along the north and south shores of the St. Lawrence River to recruit for the Canadian Overseas Expeditionary Forces. The recruiting campaign will be in charge of H. J. Lyons, Vice President in charge of operation, Canada & Gulf Terminal Ry., who is qualifying for a captaincy.

W. B. Howard, whose appointment as District Passenger Agent, C.P.R., Toronto, was announced in our last issue, was entertained to dinner by a number of friends at St. John, N.B., Feb. 1, and was presented with a gold-headed umbrella, a smoking set, and a desk clock, by the staff, and local conductors, on his leaving after having occupied the position of District Passenger Agent there for some years.

J. J. Hill, formerly President, and Chairman, Great Northern Ry., is reported from St. Paul, Minn., to be engaged on a plan for the reconstruction of Belgian finances in preparation for the settlement after the war. This work, it is stated, has been undertaken at the request of the King of the Belgians, who, some years ago, was a guest of Mr. Hill on a tour through the western United States.

A. B. Smith, who owing to ill health resigned the position of Manager of Telegraphs, Grand Trunk and Grand Trunk Pacific Rys., has been presented with a very handsome gramophone and records by officials and employees of both companies who came under his jurisdiction, as a token of their regard and a souvenir of pleasant relations that at all times existed between himself and the staff. A bouquet of roses was presented to Mrs. Smith at the same time.

William Brunswick Howard, whose appointment as District Passenger Agent, C.P.R., Toronto, was announced in our last issue, was born at Chatham, N.B., Sept. 15, 1877, and entered C.P.R. service, Aug. 1897, since when he has been, to Aug. 1899, clerk; Aug. 1899 to Feb. 1902, Travelling Passenger Agent; Feb. 1902, to June 1906, chief clerk; June 1906, to Jan. 1907, acting District Passenger Agent; Jan. 1907, to Jan. 31, 1916, District Passenger Agent, all at St. John, N.B.

William E. Allison, who has been appointed Assistant General Baggage Agent, Eastern Lines, C.P.R., Montreal, was born at St. Eugen, Ont., Aug. 1, 1886, and entered C.P.R. service in Mar. 1905 since when he has been, to Mar. 1910, clerk in General Baggage Department, Montreal; Mar. 1910 to Nov. 1911, Travelling Baggage Agent, Montreal; Nov. 1911 to Mar. 1912, General Travelling Baggage Agent, Winnipeg; Mar. 1912 to Mar. 1913, District Baggage Agent, Calgary, Alta.; Mar. 1913 to Jan. 1, 1916, chief clerk, General Baggage Department Montreal.

The Minister of Railways and Canals, replying to questions in the House of Commons, Feb. 8, stated that W. R. Devenish, A.M.Can.Soc.C.E., who was recently appointed Superintendent, District 2, Intercolonial Ry., Campbellton,

N. B., was of Irish birth and had always been a British subject. His jurisdiction covers 290 miles of main line, 92 of which are in Quebec, and 362 miles of branch lines, including the Canada Eastern, International Ry. of New Brunswick and the St. John Valley Ry., none of which is in Quebec. He acted as secretary to F. P. Gutelius, M.Can.Soc.C.E., who was appointed a commission to enquire into the construction of the National Transcontinental Ry., and received a salary of \$2,400 a year.

C. C. Kirby, A.M.Can.Soc.C.E., whose appointment as Division Engineer, Atlantic Division, C.P.R., St. John, N. B., was announced in our last issue, was born at Newport, Monmouth, Eng., Mar. 8, 1880, and from 1898 to 1907, was pupil and Assistant Engineer with Kirby Son and Brown, there. He came to Canada in 1907, and has been, from June 1907 to Feb. 1908, instrument man, location survey, Kingston, Smiths Falls and Ottawa Ry., G.T.R., June 1908 to Apr. 1909, not in railway service; Apr. 1909 to May 1910, transit man, C.P.R., Ottawa, Ont.; May 1910 to Feb. 1912, Resident Engineer, District 3, Eastern Division, C.P.R., Montreal; Feb. 1912 to Jan. 1913 Resident Engineer, Montreal Terminals, C.P.R.; Jan. 1913 to Dec. 31, 1915, Assistant Engineer, C.P.R., Montreal.

William Tansley, who has been appointed Assistant Superintendent, District 2, Ontario Division, London, was born at Shelburne, Ont., Dec. 27, 1872, and entered C.P.R. service in 1889 since when he has been, to 1900, operator and agent at various points on the Ontario Division; 1900 to 1907, dispatcher, Toronto; 1907 to 1912, Chief Dispatcher, Toronto; 1912 to 1914, Assistant Superintendent, District 1, Ontario Division, Havelock; 1914 to May 18, 1915, Assistant Superintendent, District 3, Ontario Division, Toronto; May 18 to June 1915, Assistant Superintendent, District 5, Eastern Division, Smiths Falls, Ont.; June to Dec. 1915, acting Superintendent of Car Service, Eastern Lines, Montreal; Dec. 1915 to Feb. 1916, Assistant Superintendent, Montreal Terminals.

Alfred G. Richardson, who has been appointed District Passenger Agent, C. P.R., Winnipeg, was born at Rockford, Ill., Oct. 16, 1880, and entered railway service in Oct. 1898, since when he has been, to Dec. 1900, clerk in local freight office, Illinois Central Rd., Chicago, Ill.; June 1901 to Dec. 1903, clerk in general passenger office, Chicago Burlington and Quincy Rd., Chicago, Ill.; Jan. 1904 to Oct. 1905, stenographer general passenger office, Southern Pacific Co., Portland Ore.; Nov. 1905 to June 1907, ticket clerk, Northern Pacific Ry., Portland, Ore.; July 1907 to Apr. 1908, Travelling Passenger Agent, Chicago Rock Island and Pacific Ry., Portland, Ore.; Apr. 1908 to Mar. 1910, City Passenger Agent, C.P.R., Portland, Ore.; Apr. 1910 to Jan. 31, 1916, City Passenger Agent, C.P.R., Winnipeg.

August Kastella, Mechanical Superintendent of Dredges, Public Works Department, Ottawa, was dismissed from his position, Feb. 11. It appears that he was born in Germany, and came from Hanover to Canada in 1909, and entered G.T.R. service, in that year, as electrical engineer at Stratford, Ont., remaining there until Mar. 1913 when he was transferred to Ottawa in charge of light, heat and power at the G.T.R. station and the Chateau Laurier. He was appointed Mechanical Superintendent of Dredges, Public Works Department, May 20,

1914. It is stated that he had applied for naturalization since the outbreak of war. The Minister of Public Works has stated that the dismissal was owing to some irregularities and to unsatisfactory work in connection with the discharge of his departmental duties.

Herbert George Dring, whose appointment as General Passenger Agent, C.P.R., London, Eng., was announced in our last issue, was born at Easton, Northamptonshire, Eng., Mar. 8, 1881 and entered C.P.R. Passenger Department service in London, Mar. 1, 1897, since when he has been, to Sept. 30, 1897, junior clerk; Oct. 1, 1897 to Dec. 31, 1898, clerk; Jan. 1, to Dec. 31, 1899, shorthand clerk; Jan. 1, 1900 to June 30, 1901, general and correspondence clerk; July 1, 1901 to Mar. 31, 1904, booking and correspondence clerk; Apr. 1, 1904 to Aug. 31, 1905, chief booking and correspondence clerk; Sept. 1, 1905 to Mar. 31, 1907 chief clerk to General Passenger Agent; Apr. 1, 1908 to Dec. 31, 1915, Assistant General Passenger Agent. Since his appointment as General Passenger Agent, his former position has been abolished.

J. H. Boyle, who has been appointed Superintendent, District 1, Eastern Division, C.P.R., Farnham, Que., was born at Waterloo, Que., June 25, 1896, and entered C.P.R. service Apr. 12, 1888 since when he has been, to Aug. 1890, freight brakeman; Aug. 1890 to Nov. 1903, conductor; Nov. 1903 to Sept. 15, 1906, Trainmaster, District 1, Eastern Division, Farnham, Que.; Sept. 15, 1906 to Aug. 15, 1907, Trainmaster, District 3, Eastern Division, Montreal; Aug. 15, 1907 to Jan. 1, 1908, Trainmaster, District 2, Eastern Division, Smiths Falls, Ont.; Jan. 1 to May 13, 1908, Trainmaster, District 3, Eastern Division, Montreal; May 13, 1908 to Apr. 29, 1911, Assistant Superintendent, District 3, Eastern Division, Montreal; Apr. 29, 1911 to Apr. 1912 Assistant Superintendent, District 4, Eastern Division, Ottawa, Ont.; Aug. 1912 to Jan. 7, 1916, Superintendent, District 3, Lake Superior Division, Schreiber, Ont.

Sir Charles Rivers Wilson, G.C.M.G., C.B., former President, G.T.R., died in London, Eng., Feb. 9, after a long illness. He was born in London in 1831, and served the British Government in various capacities. He was for two years Finance Minister in Egypt, and was also one of the administrators of the Suez Canal Co., and later Vice President, and acting President during the absence of Count Ferdinand de Lesseps. From 1874, to 1894, he was also Comptroller-General of the National Debt Office, London, and resigned that office and also his connection with the Suez Canal on his appointment as President, G.T.R., early in 1895. During his period of office, the G.T.R. carried out what was really a scheme of general reconstruction, and undertook the building of the Grand Trunk Pacific Ry. He retired in 1909. In addition to receiving the Order of the Bath in recognition of his work in Egypt, he was given the Turkish Order of the Medjidie.

E. W. DuVal, who has been appointed acting General Superintendent, Saskatchewan Division, C.P.R., Moose Jaw, was born at Toledo, Ohio, June 5, 1885, and entered railway service July 1, 1902, since when he has been, to June 1, 1905, in Superintendent's office, Canadian Northern Ry., Winnipeg; June 1, 1905, to Jan. 2, 1911, successively, secretary to General Superintendent, Central Division,

C.P.R., Winnipeg; assistant chief clerk to General Superintendent, Central Division, C.P.R., Winnipeg; chief clerk to General Superintendent, Western Division, C.P.R., Calgary, Alta.; chief clerk to Assistant General Manager, and later to General Manager, Western Lines, C.P.R., Winnipeg; and Trainmaster, C.P.R. terminals, Calgary, Alta.; Jan. 2, 1911, to Apr. 6, 1912, Superintendent, District 1, Saskatchewan Division, C.P.R., Moose Jaw; Apr. 6, 1912, to May 1913, Superintendent, District 4, Manitoba Division, C.P.R., Souris; May 1913, to Feb. 1, 1916, Superintendent, District 3, Saskatchewan Division, C.P.R., Saskatoon.

Fred M. Rutter, A.M.Can.Soc.C.E., who has been appointed Superintendent, District 3, Ontario Division, C.P.R., Toronto, was born there, Dec. 26, 1880, and educated at Upper Canada College and the University of Toronto. He entered C.P.R. service Apr. 21, 1902, since when he has been, to Sept. 10, 1902, chainman, Labelle Extension; Sept. 10, 1902 to Apr. 18, 1908, clerk, Operating Department, Woodstock, N. B.; Apr. 18, 1903 to Apr. 7, 1904, rodman, North Bay, Ont.; Apr. 7 to Sept. 19, 1904, transitman, Sudbury, Ont., and Megantic, Que.; Sept. 19, 1904 to Feb. 8, 1906, Resident Engineer on construction, Toronto-Sudbury Line; Feb. 8, 1906 to Mar. 22, 1907 Assistant Engineer, Maintenance of Way, District 3, Eastern Division, Montreal; Mar. 22, 1907 to May 9, 1911, Resident Engineer, Maintenance of Way, Woodstock, N.B.; May 9, 1911 to July 16, 1913, Resident Engineer, Toronto, July 16, 1913, to May 1, 1915, Assistant Division Engineer, Eastern Division, Montreal; May 1, 1915 to Feb. 1, 1916, Assistant Superintendent, District 3, Ontario Division, Toronto.

A. W. Wheatley, who has been appointed President, Lima Locomotive Corporation, Lima, Ohio, on a change of ownership, was born at Ashford, Kent, Eng., and served an apprenticeship as machinist in the South Eastern Ry. shops there. In 1892 he went to the United States, since when he has been, to 1894 in Northern Pacific Ry. service, St. Paul, Minn.; 1894, in same service, Staples, Minn.; 1895 to 1900, Roundhouse Foreman, same place; 1900 to 1902, General Foreman same road, Livingstone, Mont.; Dec. 1902 to June 1903, Master Mechanic, Yellowstone Division, same road, Glendive, Mont.; June 1903 to Mar. 1904, General Master Mechanic, same road, St. Paul, Minn.; Feb. 1905 to Mar. 1906, Shop Superintendent, Chicago, Rock Island and Pacific Ry., Moline, Ill.; Mar. 1906 to June 1, 1907, Assistant Superintendent of Motive Power, Union Pacific Ry., Omaha, Neb.; June 1 to Oct. 1907, General Inspector, American Locomotive Co., Schenectady, N. Y.; Oct. 1907 to Nov. 1910 Manager, Montreal Locomotive Works, Ltd., Montreal; Nov. 1910 to Aug. 1911, Manager, American Locomotive Co., Dunkirk, N. Y.; Aug. 1911 he was appointed General Manager, and on the reorganization of the company, also Vice President, Canadian Locomotive Co., Ltd., Kingston, Ont.

Adam Rutherford Creelman, K.C., a director, and former General Counsel, C.P.R., died at Montreal, Feb. 6, after a lengthened illness. He was born at Richibucto, N. B., Sept. 21, 1849, and educated there and at Chatham, N. B. He studied law with the late Adam Crooks Q.C., and was called to the bar at Toronto in 1875, and entered the firm of Crooks, Kingsmill and Cattinach, leaving there in 1877 to become a partner in the firm of McCarthy, Osler, Hoskin

and Creelman, Toronto. He was created a Q.C. in 1889, and remained in private practice until July 1901, when he was appointed Chief Solicitor, C.P.R., Mon. He subsequently was appointed General Counsel, and was elected a director of the company in 1910, and was also a director of the Kingston and Pembroke Ry. He retired from active service in June 1913, when the following circular was issued over the signature of the President: "A. R. Creelman, K.C., General Counsel, having asked to be relieved of his duties that he may enjoy a well earned rest and recreation, the Board of Directors and Executive Officers in acceding to his wish, and accepting his resignation, desire to express their hearty appreciation of his advice and co-operation during the company's most progressive years. He continues his connection with the company, as a director, and will act on occasion as Special Counsel." The funeral took place at Toronto, Feb. 8, only relatives and intimate friends being present. E. W. Beatty, K.C., Vice President and General Counsel, C.P.R., represented the company.

Alexander Forrester Stewart, M.Can. Soc.C.E., who has been appointed Chief Engineer, Eastern Lines, Canadian Northern Ry., Toronto, was born at West Bay, Cape Breton, N.S., Jan. 8, 1864, and graduated from Dalhousie University, in arts, in 1887. He entered railway service May 15, 1887, since when he has been, to July 1887, chairman, Boston and Quebec Air Line, Skowhegan, Me.; Aug. to Dec. 1887, rodman, St. Paul, Minneapolis and Manitoba Ry., Dakota and Montana; Jan. to June, 1888, leveller on survey in Ontario, C.P.R.; June 1888 to Apr. 1889, leveller and transit man on surveys in Manitoba and Northwest Territories, C.P.R.; Apr. 1889 to Mar. 1891, leveller and transit man on surveys and Resident Engineer on construction in British Columbia, C.P.R.; Mar. 1891 to June 1895, Engineer in charge of branch line surveys and construction in British Columbia, C.P.R.; July 1895, to July 1896, Contractor's Engineer, South Coast Ry., Natal, South Africa; July 1896, to Mar. 1897, District Engineer of Surveys, Pretoria-Pietersburgh Ry., Transvaal, South Africa; Mar. 1897, to Nov. 1899, District Engineer on Construction, Orange Free State Government Railways, South Africa; Nov. 1899, to Feb. 1900, District Engineer of Surveys, Zululand Ry., Zululand, South Africa; Feb. to Aug. 1900, District Engineer of Surveys, Pauling and Co., Ltd., contractors, Cape Colony; Aug. 1900, to Dec. 1901, District Engineer of Maintenance and Reconstruction, Imperial Military Rys., Eastern Transvaal; May to June 1902, Division Engineer of Surveys, Halifax and South Western Ry., Halifax, N.S.; June 1902, to Mar. 1903, District Engineer of Maintenance, Central South Africa Government Rys., Pretoria; Mar. 1903, to Dec. 1904, District Engineer of Surveys, Cape Government Rys., Cape Colony; Dec. 1904, to Dec. 1906, District Engineer of Maintenance, Cape Government Rys., Kimberley, South Africa; Jan. 1907, to Dec. 1908, Assistant Chief Engineer of Construction, Mackenzie, Mann and Co., Ltd., Toronto; Dec. 1908, to Jan. 1916, Chief Engineer of Construction, Mackenzie, Mann and Co., Ltd., Toronto. In addition to being a member of the Canadian Society of Civil Engineers, he is a member of the Institute of Civil Engineers, (England), and of the South African Society of Civil Engineers.

George Herrick Duggan, who has been elected President of the Canadian So-

ciety of Civil Engineers, was born in Toronto, Canada, in 1862, and was educated at Upper Canada College, Toronto, and at the School of Practical Science, Toronto University. In 1884 he entered Canadian Pacific Ry. service and was assigned to location work on the mountain division. He remained with the railway until the end of 1885, before which time he had been assigned to the drawing office and placed in charge of the division of bridge erection and of a section of grading. In Jan. 1886, he entered the Dominion Bridge Co.'s drawing office, becoming chief draughtsman in 1889 and Chief Engineer in 1891, which position he held until the end of 1901. During this period the company erected a number of bridges, including the first Coteau bridge, the Grand Narrows and St. Mary's River bridges, the Interprovincial bridge at Ottawa, the swing bridge and the emergency dam at Sault St. Marie, Ont., as well as the first Canadian hydraulic liftlock, on the Trent Canal, at Peterborough, Ont. He went to Sydney, N.S., in Jan. 1902 as Assistant to the President of the Dominion Iron & Steel Co. and of the Dominion Coal Co. A considerable amount of civil engineering work was then being prosecuted by both companies, and he was placed in charge of it. In 1907 he became Third Vice President of both companies, and in 1905, when the companies separated, he was appointed Second Vice President and General Manager of the Dominion Coal Co., remaining in that capacity until 1910. He was responsible for the engineering work of the Dominion Coal Co. and for the opening of a number of new mines, the construction of docks and unloading plants and the extension and operation of the company's railway service. In 1910 he returned to the Dominion Bridge Co. as Chief Engineer, in which capacity he was responsible for the preparation of the design for the new Quebec bridge, for which tenders were being prepared at the time he became Chief Engineer. In 1912 he was appointed Vice President and General Manager of the Dominion Bridge Co. and Chief Engineer of the St. Lawrence Bridge Co., a company which was formed to bid on the superstructure of the new Quebec bridge and which was awarded that contract. He has continued actively since then in the great work of building this bridge.

Alleged German plots Against Canadian Railways.—A total of 81 indictments were returned against Francis Bopp, Consul General of the German Empire, and other officials and German firms and individuals in San Francisco, Cal., Feb. 10. Among the specific charges alleged by the United States Government agents, is that the accused or some of them had conspired to blow up the G.T.R. tunnel between Sarnia, Ont., and Port Huron, Mich., and the proposed conveyance of explosives into Canada for the purpose of blowing up C.P.R. tunnels in British Columbia.

Railway Lands Patented.—Letters patent were issued during Jan., in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

Calgary & Edmonton Ry.	Acres.
Canadian Northern Ry.	322.00
Grand Trunk Pacific Branch Lines Co.	4,315.90
Grand Trunk Pacific Ry.	51.99
Qu'Appelle, Long Lake & Saskatchewan Rd. & Steamboat Co.	195.14
	5,356.80
Total	10,241.83

A Strategic Railway of about 100 miles is reported under construction between the Hadjaz Ry. and the Egyptian frontier.

Canadian Society of Civil Engineers' Officers.

The following officers, etc., were elected at the annual meeting in Montreal, Jan. 27:—President, G. H. Duggan, Vice President and General Manager, Dominion Bridge Co., Montreal; Vice President, T. H. White, Chief Engineer, Canadian Northern Pacific Ry., Vancouver.

Councillors:—District 1: W. J. Francis, Montreal; H. R. Safford, Chief Engineer, G.T.R., Montreal. District 2: H. Donkin, Deputy Commissioner, Public Works and Mines, Halifax, N.S.. District 3: A. E. Doucet, Quebec. District 4: E. D. Lafleur, Chief Engineer, Public Works Department, Ottawa. District 5: J. R. W. Ambrose, Chief Engineer, Toronto Terminals Ry., Toronto. District 6: D. A. Ross, Winnipeg. District 7: D. O. Lewis, District Engineer, Canadian Northern Pacific Ry., Victoria, B.C.

Treasurer, E. Marceau, Montreal. Secretary, C. H. McLeod, Montreal.

Two vice presidents and 16 councillors remain in office from the previous year.

Lima Locomotive Corporation.—The control of this corporation has been bought by J. S. Coffin, President, and S. G. Allen, First Vice President, Franklin Railway Supply Co., New York. The new officers are as follows:—Chairman of Board of Directors, J. S. Coffin; President, A. W. Wheatley, heretofore Vice President, Canadian Locomotive Co., Ltd., Kingston, Ont.; Vice President and General Sales Manager, J. E. Dixon, formerly of the American Locomotive Co.; Secretary and Treasurer, J. H. Guess, formerly General Purchasing Agent, Grand Trunk Ry., who will be in charge of purchasing.

The Canadian Railway Club's annual dinner in Montreal Jan. 29 was largely attended. In the absence of the President, L. C. Ord, Assistant Works Manager, Angus shops, C.P.R., on active military service, the Vice President, R. M. Hannaford, Assistant Chief Engineer, Montreal Tramways Co., occupied the chair. Among the other speakers were Sir Sam Hughes, Minister of Militia; F. P. Gutelius, General Manager, Canadian Government Railways; J. Coleman, Superintendent, Car Department, G.T.R.; T. C. Hudson, Division Master Mechanic, Canadian Northern Ry., and W. McNab, Valuation Engineer, G.T.R.

Interest on Guaranteed Railway Bonds.—Replying to question in the House of Commons Feb. 17, the Minister of Finance said the Government had not paid by special warrant the half yearly interest on Dominion and provincial guarantees of the Canadian Northern Ry., nor of the half yearly interest on the Dominion guarantee of the Grand Trunk Pacific Ry. There were no interest payments made on guarantees to railways by the Government during 1914 and 1915, nor up to the date of the answer given.

Railway Taxation in Manitoba.—The Manitoba Legislature has passed an act repealing the Revised Statutes of 1913, chap. 193, sec. 16, which enacted that "nothing contained in this act shall take away or lessen any exemption from taxation heretofore granted any railway company by or under any act of the Legislature of Manitoba."

The Public Works Department received tenders to Feb. 28, for the construction of timber lock gates and equipment, for the East River lock, near New Glasgow, N. S.

Canadian Railway AND Marine World

ESTABLISHED 1898

Devoted to Steam and Electric Railway,
Marine, Express, Telegraph, and Railway and Canal
Contractors' Interests.

Official Organ of various Canadian Transportation
Associations.

Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C.E.
Managing Director and Editor-in Chief.

AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editors
JOHN KEIR AND DONALD F. KEIR

Canadian Business Representative,
W. H. HEWITT, 70 Bond Street, Toronto
United States, Business Representative,
A. FENTON WALKER, 143 Liberty St., New York
European Business Representative,
J. MEREDITH MCKIM, 16 Regent St., London, Eng.

Authorized by the Postmaster General for Canada,
for transmission as second class matter.

Entered as second class matter, July 25, 1913, at the
Postoffice at Buffalo, N.Y., under the Act of Congress
of March 3, 1879.

SUBSCRIPTION PRICE, including postage any-
where, \$2 a year.

SINGLE COPIES, 20 cents each, including postage.

The best and safest way to remit is by express money
order. Where one cannot be obtained, a post office
money order, or bank draft, payable at par in Toronto,
may be sent. Cheques or drafts not payable at par in
Toronto cannot be accepted. Remittances should be
made payable to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by
the 10th of the month preceding the date of publication.

TORONTO, CANADA, MARCH, 1916

PRINCIPAL CONTENTS.

Appointments, Transportation	104
Audit Department's Relation to Railway Or- ganization	96
Birthdays of Transportation Men	87
Board of Railway Commissioners	
Orders by, Summaries of	90
Traffic Orders	99
Canadian Northern Ry. Construction, Etc....	94
Transcontinental Passenger Cars	84
Canadian Pacific Ry. Construction	91
Remarkable Earnings	137
Rogers Pass Pioneer Tunnel	86
Electric Railway Department	118 to 141
Berlin & Waterloo St. Ry.	113
Finance, Meetings, Etc.	117
Lake Erie & Northern Ry. Operation.....	112
London St. Ry. Report	113
Ottawa Electric Ry. and Safety First.....	114
Ottawa Traction Co's Annual Meeting	111
Projects, Construction, Etc.	117
Railway Charters on Niagara Peninsula.....	117
Shawinigan Water & Power Co's Railways.....	113
Toronto Ry., Cars	111
Report	113
Toronto Suburban Ry., Interurban Cars.....	110
Winnipeg Electric Ry. and Automobile Col- lections	111
Express Companies, Among the	126
Freight and Passenger Traffic Notes	109
Grain in Store at Terminal Elevators, Etc....	122
Mainly About Railway People	100
Marine Department	118 to 125
Canadian Lake Protective Association.....	123
Dominion Marine Association	125
Great Lakes Vessels in Ocean Service.....	119
Montreal Harbor Commissioners' Railway Electrification	118
St. Lawrence Ship Channel Improvements.....	118
Shipping Federation of Canada	120
Shipping Under War Conditions	118
Passenger Car Construction and Design Im- provements	97
Railway Development	106
Railway Earnings	97
Railway Finance, Meetings, Etc.	91
Railway Mechanical Methods and Devices.....	88, 89
Railway Rolling Stock Notes	94
Railway Track Laid in 1915	105
Telegraph, Telephone and Cable Matters.....	95
Track, Causes and Prevention	95

Progress of Rogers Pass Tunnel Construction.

The following table, for which we are indebted to J. G. Sullivan, M.Can.Soc.C.E. Chief Engineer, C.P.R., Winnipeg, shows the progress made from Dec. 30, 1915, to Jan. 17, and the total progress to Jan 27:—

EAST END.	Progress.	Total.
Main tunnel	806 ft.	9,548 ft.
WEST END.		
Main tunnel	557 ft.	9,849 ft.

One-man Car Operation.—Investigation by the American Electric Railway Association shows that out of a total of 111 American cities in which one-man car operation is in use, 30 cities in 1910 had a population of more than 25,000, which means that 27% of the cities using the one-man method of operation are cities of large population. Eight other cities ranged between 20,000 and 25,000 population and 45 others are between 10,000 and 20,000, leaving for the small city of less than 10,000 a total of but 28. Of the 30 companies operating in cities with more than 25,000 inhabitants there are two companies the population of whose cities are more than 500,000; one city over 200,000, and one over 100,000, which shows the favor with which one-man operation is being met, and its ascending popularity for larger city operation.

Navigation Seasons at Port Nelson.—The record of the first steamship arrivals at, and the last departures from, Port Nelson, Hudson Bay, for 1912 to 1915, was given in the House of Commons, Feb. 7, as follows:—1912, s.s. Beothic arrived off Nelson roads, July 24, but for lack of pilot did not proceed up river until July 29; after clearing, she proceeded to James Bay. 1913, s.s. Bonaventure arrived at Port Nelson, Aug. 6, and cleared from there, with the steamships Bellaventure and Sinbad, Oct. 13, being followed on Oct. 19 by the Dominion Government survey steamship Acadia. 1914, s.s. Bonaventure arrived at Port Nelson, Aug. 14; the steamships Bellaventure and Sheba cleared from there, Oct. 17. 1915, s.s. Bellaventure arrived at Port Nelson Aug. 1, and cleared from there, with the steamships Adventure and Sheba, Oct. 22.

Judgment was given in the October Court of Appeal, Jan. 24, in an action in which the County of Wentworth, the City of Hamilton and the Hamilton Radial Ry. were concerned. The railway extends from Hamilton to Oakville, the city and county authorities granting franchises, in respect of which certain payments are made. Some difference arose between the city and county respecting these payments, with the result that action was brought, and a verdict was given July 2, 1914, in favor of the county. Against this the city appealed, with the result that the appeal has been allowed and the original action dismissed.

Alaska halibut fishermen have petitioned the United States Government to take steps to protect the industry. It is alleged that owing to the opening of the Grand Trunk Pacific Ry., the centre of the fisheries in Alaskan waters has been shifted from Ketchikan, Alaska, to Prince Rupert, B.C.

The Canadian Ticket Agents Association will hold its next annual meeting and outing at Port Arthur, Ont., early in June.

The Dominion Government Railway to Hudson Bay engineering staff has given \$513.97 as a special donation to the Manitoba Patriotic Fund.

Grain Inspection at Western Points.

Following are the number of cars of grain inspected on the Canadian Pacific, Canadian Northern, Great Northern and Grand Trunk Pacific Rys. at Winnipeg and other points in the Western Division, in Jan. 1916, in the 5 months ended Jan. 1916, and in the 5 months ended Jan. 1915, respectively:—

	5 months to Jan. 1916	5 months to Jan. 1916	5 months to Jan. 1915
C.P.R.	5,630	107,840	41,089
C.P.R., Calgary... ..	599	2,837	2,831
C.N.R.	3,802	55,632	25,922
G.N.R., Duluth ..	101	2,677	833
G.T.P.	1,593	27,412	10,634
Total	11,725	196,398	81,369

Too Late for Classification.

The Dominion Government s.s. Quadra was sunk off Nanaimo, B.C., Feb. 26, in collision with the C.P.R. s.s. Charmer, the crew being saved. She was valued at about \$80,000 and was engaged in the fishery patrol and lighthouse and buoy service on the Pacific coast.

Canada Steamship Lines' s.s. Empress of Fort William, which since Aug. 4, 1914, has been engaged in ocean service, was sunk by a mine off Dover, England, Feb. 26, while attempting to rescue the crew of the s.s. Maloja, which had struck a mine. The Empress of Fort William was built at Newcastle, England, in 1908, and was formerly owned by the Empress Transportation Co., Midland, Ont., and was later absorbed by Canada Steamship Lines, Ltd. Her dimensions were: Length 250 ft., breadth 43 ft., depth 25 ft., and she had a cargo capacity of 3,440 tons.

The Transit Co., Ltd., has been incorporated under the Dominion Companies Act, with \$250,000 authorized capital, and office at Toronto, to carry on a general shipowning and operating business, and in connection therewith to own and operate steam and other vessels, and to enter into agreements with steam and electric railway companies to move and operate their rolling stock. The incorporators are all connected with a Toronto legal firm.

The Manitoba Public Utilities Commissioner recently suspended the order directing the Winnipeg Electric Ry. to operate its cars over the Arlington St. bridge, Winnipeg. The Board of Control on Feb. 5, instructed the City Solicitor to apply for a renewal of the order. This new application will enable the question of the sufficiency of the existing brakes on the cars, to ensure safety on the gradient at the bridge, to be settled.

The Saskatchewan Co-operative Elevator Co. proposes to extend its system to include the ownership and operation of terminal elevator facilities at the head of the lakes, and is taking steps to have the matter discussed in the Legislature, with the view of having such extension authorized, and if necessary, obtaining the financial co-operation of the province.

C. H. Gaunt, heretofore General Manager, Pacific Division, Western Union Telegraph Co., San Francisco, Cal., has been appointed General Manager at Chicago, Ill., with jurisdiction over the company's lines in ten States. He is succeeded at San Francisco by M. T. Cook, heretofore Assistant General Manager, Chicago, Ill.

During 1915, 89,195,875 tons of bulk freight were handled on the Great Lakes, an increase of 16,256,272 over 1914.

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Algoma Central & Hudson Bay Ry., Algoma Eastern Ry.—I. L. GODFREY, Comptroller, has also been appointed Treasurer, vice R. Barber, resigned to enter Algoma Steel Corporation's service. He will act in the dual capacities for the Receivers of the A.C. & H.B.R. and Algoma Central Terminals, Ltd., Algoma Eastern Ry., Algoma Eastern Terminals, Ltd., Superior Rolling Stock Co., British American Empress Co., and Algoma Rolling Stock Co. Office, Sault Ste. Marie, Ont.

E. B. BARBER has been appointed Assistant Comptroller and Assistant Treasurer of the above named companies. Office, Sault Ste. Marie, Ont.

Algoma Central Steamship Line.—W. J. McCORMACK, heretofore Superintendent. Northern Navigation Co., Sarnia, Ont., has been appointed Superintendent, Algoma Central Steamship Line, vice S. V. McLeod, resigned. Office, Sault Ste. Marie, Ont.

Canadian Northern Ry.—A. F. STEWART, heretofore Chief Engineer of Construction, Mackenzie, Mann & Co., Ltd., Toronto, has been appointed Chief Engineer, lines east of Port Arthur, Ont., C.N.R. Office, Toronto.

G. C. BRIGGS, heretofore Inspector of Buildings, Mackenzie, Mann & Co., Ltd., has been appointed Supervisor of Bridges and Buildings, Eastern Lines. C.N.R., his jurisdiction covering the design and construction of new buildings only. O. KERR, Supervisor of Bridges and Buildings, is in charge of the maintenance of bridges and buildings. Office, Toronto.

G. CLISSOLD, heretofore Night Locomotive Foreman, has been appointed Assistant Foreman, Rainy River, Ont., vice E. R. Mills, promoted.

B. T. PATTERSON, heretofore machinist, has been appointed Night Locomotive Foreman, Rainy River, Ont., vice G. Clissold, promoted.

E. R. MILLS, heretofore Assistant Foreman, Rainy River, Ont., has been appointed Locomotive Foreman, Dauphin, Man., vice J. Duncanson, assigned to other duties.

C. R. STOKES, heretofore Car Foreman, Saskatoon, Sask., has been appointed Car Foreman, Dauphin, Man., vice J. Grant, transferred.

J. GRANT, heretofore Car Foreman, Dauphin, Man., has been appointed Car Foreman, Saskatoon, Sask., vice C. R. Stokes, transferred.

P. K. MANAHAN, heretofore Trainmaster, Saskatoon, Sask., has been appointed acting Trainmaster, Kamloops Jct., B.C.

T. R. MACLEOD, heretofore Superintendent, New Westminster, B.C., has been appointed acting Superintendent of tracklaying on Patricia Bay Branch, Vancouver Island. Office, Belmont Block, Victoria.

F. A. YOUNG, who at the time of his retirement from the C.N.R. service some two years ago was Division Freight Agent, Ontario Lines, Toronto, has been appointed General Agent (Freight and Passenger) at 233 Broadway, New York, N.Y., where the company has opened an office.

Canadian Pacific Ocean Services, Ltd.—In addition to a number of appoint-

ments and transfers following on the organization of this company, already mentioned in Canadian Railway and Marine World, the following are reported: CAPT. E. BEETHAM, Marine Superintendent, Vancouver, B.C.; JAMES McGOWN, Assistant Superintendent Engineer, Vancouver, B.C.; W. J. SERGENT, Chief Superintendent Engineer, Liverpool, Eng.; KENNETH MACKENZIE, Assistant Superintendent Engineer, Liverpool, Eng.; L. J. COATES, Chief Accountant, Liverpool, Eng.; W. ADAM, Purchasing Agent, Liverpool, Eng.; Capt. D. R. W. PARSONS, Marine Superintendent, London, Eng.; G. H. BUTTERWORTH, Assistant Superintendent Engineer, London, Eng.; A. S. RAY, Agent, Bristol, Eng.; W. D. GROSSET, Agent, Glasgow, Scotland; Capt. W. CHRISTIE, Marine Superintendent, Glasgow, Scotland; JOHN RUSSELL, Assistant Super-



W. B. Howard,
District Passenger Agent, Canadian Pacific Railway, Toronto.

intendent Engineer, Glasgow, Scotland; H. T. RICHARDSON, Assistant Superintendent Engineer, Hong Kong, China.

Canadian Pacific Ry.—W. E. ALLISON, heretofore chief clerk, General Baggage Department, has been appointed Assistant General Baggage Agent, Eastern Lines. Office, Montreal.

J. H. BOYLE, heretofore Superintendent, District 3, Lake Superior Division, Schreiber, Ont., has been appointed Superintendent, District 1, Eastern Division, vice F. W. Cooper, whose transfer to Schreiber was announced in our last issue. Office, Farnham, Que.

J. B. BLAIR, heretofore General Yardmaster, Windsor, Ont., has been appointed Assistant Superintendent, Montreal Terminals, vice W. K. Tansley, transferred.

F. M. RUTTER, A.M.Can.Soc.C.E., heretofore Assistant Superintendent, District 3, Ontario Division, has been appointed Superintendent, District 3, On-

tario Division, vice W. K. Thompson, retired. Office, Toronto.

D. PAISLEY, heretofore conductor, has been appointed General Yardmaster, Windsor, Ont., vice J. B. Blair, promoted.

G. TWIST, heretofore Locomotive Foreman, Brandon, Man., has been appointed Locomotive Foreman, Fort William, Ont., vice A. Brown, promoted.

J. NEILL, formerly District Master Mechanic, Moose Jaw, Sask., who was recently appointed District Master Mechanic, Calgary, Alta., vice W. J. Renix, transferred to Revelstoke, B.C., has since been appointed District Master Mechanic, Kenora, Ont., vice S. West, transferred.

A. W. CLARK, heretofore Locomotive Foreman, Kamloops, B.C., has been appointed Locomotive Foreman, Brandon, Man., vice G. Twist, transferred.

A. BROWN, heretofore Locomotive Foreman, Fort William, Ont., has been appointed District Master Mechanic, Winnipeg, vice A. Piers, whose appointment as District Master Mechanic, Moose Jaw, Sask., was announced in our last issue.

A. G. RICHARDSON, heretofore City Passenger Agent, Winnipeg, has been appointed District Passenger Agent, there.

R. L. LOWE has been appointed Commissary Agent, Winnipeg, vice T. M. McKeown, whose appointment as Commissary Agent, Victoria, B.C., was announced in our last issue.

E. W. DUVAL, heretofore Superintendent, District 3, Saskatchewan Division, Saskatoon, has been appointed acting General Superintendent, Saskatchewan Division, during the absence of J. G. Taylor, who has been granted leave owing to ill health. Office, Moose Jaw.

S. WEST, heretofore District Master Mechanic, Kenora, Ont., has been appointed District Master Mechanic, Medicine Hat, Alta., vice R. Brown, who has received a commission as Lieutenant for overseas service.

P. S. BEATT, heretofore Locomotive Foreman, Coronation, Alta., has been appointed Locomotive Foreman, Ogden, Alta.

B. S. HUTCHINSON has been appointed General Foreman, Ogden, Alta., vice W. H. Wortman, transferred.

W. H. WORTMAN, heretofore General Foreman, Ogden, Alta., has been appointed Locomotive Foreman, Calgary, Alta., vice J. Neill, transferred.

H. HERLICK has been appointed Locomotive Foreman, Coronation, Alta., vice P. S. Beatt, transferred.

J. USHER, heretofore locomotive man, has been appointed Locomotive Foreman, Bassano, Alta.

L. FISHER, heretofore District Master Mechanic, Revelstoke, B.C., has been appointed District Master Mechanic, Cranbrook, B.C.

E. L. SHEEHAN, heretofore City Ticket Agent, Chicago, Ill., has been appointed General Agent, Passenger Department, St. Louis, Mo., vice A. J. Blaisdell, promoted. Office, 725 Olive St.

Duluth, Winnipeg & Pacific Ry.—E. W. MYERS is reported to have been appointed storekeeper at Virginia, Minn., vice F. S. Matthey, resigned.

Grand Trunk Ry.—SIR ARTHUR YORKE, C.B., formerly Inspector of Railways under the British Board of Trade, and a director of the Great Western, South Eastern, and London, Chatham & Dover Railways of England, has been

elected a director G.T.R., succeeding the late Lord Welby.

T. RODGER, heretofore Supervisor of Telegraphs, Grand Trunk Pacific Telegraph Co., Montreal, has been appointed Superintendent of Telegraphs, G.T.R. System. Office, Montreal.

R. WRIGHT has been appointed Division Agent, Ontario Lines, vice G. A. Stokes, who was appointed Superintendent, Sarnia Tunnel Terminals, Port Huron, Mich., in Nov. 1915. Office, Toronto.

S. R. JOYCE, heretofore ticket clerk in the City Ticket Office, Toronto, has been appointed Travelling Passenger Agent there, vice Jas. Anderson, promoted.

JAMES ANDERSON, heretofore Travelling Passenger Agent, Toronto, has been appointed City Passenger and Ticket Agent, Hamilton, Ont., vice C. R. Morgan, who has enlisted for military services overseas.

S. E. DEWEY, heretofore Commercial Agent, New York, has been appointed General Eastern Freight Agent, there, with territory as covered by him as Commercial Agent. The positions of General Agent and Commercial Agent have been abolished. We are officially advised that the position of General Agent, Passenger Department, New York, held by F. P. Dwyer, remains as before.

E. J. WEARING, heretofore Passenger Agent, G.T.R., and acting General Agent, Canadian Express Co., Liverpool, Eng., has been appointed General Agent, G.T.R. System, Central Vermont Ry., and Canadian Express Co., vice W. Cuthbertson deceased. Office, 20 Water St., Liverpool.

Grand Trunk Pacific Ry.—J. ABBOTT, heretofore Chief Dispatcher, Regina, Sask., has been appointed Assistant Superintendent there. The name was given as J. Brewer in error in our 1st issue.

B. B. EIDSON, heretofore Road Foreman of Locomotives, Smithers, B.C., has been appointed Road Foreman of Locomotives, Regina, Sask. No successor has been appointed at Smithers, B.C.

C. A. MUNRO, heretofore Car Foreman, Edson, Alta., has been appointed Car Foreman, Melville, Sask., vice W. Mills, resigned.

B. WOODCOCK, heretofore Car Inspector, Melville, Sask., has been appointed Car Foreman, Edson, Alta., vice C. A. Munro, transferred.

J. MORIARTY, heretofore Roadmaster, Edson, Alta., has been appointed Roadmaster, Subdivision 11 and 12, Endako, B.C., vice J. A. McM. Brown, resigned.

Michigan Central Rd.—A. K. MASTERS has been appointed Freight Claim Agent, and F. B. McILVAINE has been appointed Assistant Freight Claim Agent, Detroit, Mich.

National Transcontinental Ry.—A. DEVINE, heretofore District Master Mechanic, Districts 1 and 2, Cochrane, Ont., has been appointed District Master Mechanic, District 1. Office, Parent, Que.

JAMES CLARK has been appointed Locomotive Foreman, Parent, Que.

J. E. RIOUX has been appointed acting Roadmaster, Doucet Subdivision, Doucet, Que.

J. J. DOONER has been appointed acting Roadmaster, Parent Subdivision, Doucet, Que.

J. R. CASSIDY, heretofore acting Roadmaster, Parent, Que., has been appointed acting Roadmaster, Fitzpatrick Subdivision, Fitzpatrick, Que.

J. E. SIMPSON, heretofore Road-

master, Parent, Que., has been appointed acting Roadmaster, Quebec Subdivision, Fitzpatrick.

A. J. ROBERTS, heretofore Locomotive Foreman, Transcona, Man., has been appointed District Master Mechanic, District 2, vice A. Devine, District Master Mechanic, Districts 1 and 2, whose jurisdiction is now confined to District 1. Office, Grant, Ont.

C. H. MOULTON, heretofore acting Road Foreman of Locomotives, District 3, Redditt, Ont., has been appointed Locomotive Foreman, Transcona, Man., vice A. J. Roberts promoted, and his former position has been abolished.

Wabash Ry.—F. H. TRISTRAM, heretofore Assistant General Passenger Agent, Ill., has been appointed General Passenger Agent. Office, St. Louis, Mo. J. S. WALSH, Jr., has been appointed Industrial Agent. Office, St. Louis, Mo.

Dominion Government Elevator at Calgary.—The Minister of Trade and Commerce, in response to questions in the House of Commons, Feb. 3, gave details of the operation of the Dominion Government grain elevator at Calgary, Alta., as follows: It was opened to receive grain, Aug. 27, 1915, and from that date to Dec. 31, received 185,455 bush. It has a total capacity of 2,500,000 bush. The intention is that the elevator shall serve all territory from which grain can be shipped economically by the Pacific Ocean, either to the Orient, or Europe by way of Cape Horn or through the Panama Canal. It is also for storage purposes, cleaning and treatment, and was not intended primarily for the shipment of grain east. Up to Jan. 14, 248,367 bush. of grain had been received.

It is announced that Canadian Government Railways is making a division of its telegraph lines along the Intercolonial Ry. so that certain wires may be used exclusively for railway purposes, and others exclusively for commercial purposes. It is stated that the work of division has been under way for some time, and will be completed early in March. The commercial business is operated under lease by the Great North Western, and Western Union Telegraph Companies.

The Toronto, Hamilton & Buffalo Ry. has ordered 780 tons of 100 lbs. steel rails and 315 tons of 80 lbs., from the Algoma Steel Corporation. Delivery is to be made during April and May. The 100 lbs. will be used for relaying on the east mountain section and the 80 lbs. for relaying on other parts of the line. The released rails will be used for siding purposes. (Feb., pg. 50.)

Quebec Central Ry. Offices Burned.—Fire broke out in the Quebec Central Ry. offices at Quebec, Que., Feb. 15, and considerable damage was done to the building and contents, all of which, it is said is covered by insurance. The fire started in the upper story of the south wing, and spread throughout the building. Most of the valuable property in the building was saved.

Canadians Woods for Railway Work.—The Canadian Pacific Ry. management, in order to encourage the use of Canadian woods for interior decorations, has decided to use Canadian forest products exclusively for the interior finish of its buildings and passenger cars.

G.T.R., vs Pere Marquette.—The Grand Trunk has issued a writ at Osgoode Hall, Toronto, against the Pere Marquette Rd., claiming \$16,506 for the use of the G.T.R. station at London from Jan. 1909, to June, 1915.

Steam Railway Track Laid in 1915.

Since the issue of our February number we have received further information as to tracklaying done on Canadian Northern Ry. western lines, which adds 15.64 miles to the figures given before, making the total mileage of track laid by C.N.R. lines during the year 247.88 instead of 232.24. This alters the total for the Dominion to 729.90 miles; and increases the mileage laid in Alberta from 299.60 to 315.24 miles.

The mileage laid in the several provinces in comparison with that laid in 1914 was:—

	Miles.	Miles.
Alberta and Great Waterways.		
Mileage 78 to 174.5, Alberta.....	96.50	
Canadian Northern System.		
Canadian Northern Quebec—		
Arundel to Rouge River, Que..	2.00	
Canadian Northern—		
Grand Marais to Victoria Beach, Man.	14.07	
Canora to Sturgis, Sask.	21.44	
Bienfait to Estevan, Sask.	8.91	
Elrose to Eston, Sask.	34.81	
Peace River Line	2.15	
Canadian Northern Sask. Ry.—		
Wroxton to Willowbrook, Sask.	41.01	
Canadian Northern Western Ry.—		
Camrose southeasterly	56.49	
Canadian Northern Pacific.—		
Gladwin to bridge 4	32.00	
Bridge 5 to bridge 7.	8.00	
Hells Gate to Goose Creek, mileage 370 to 382	12.00	
Mileage 382 to 397	15.00	
	247.88	
Canadian Pacific.		
Coronation, Sask., west	0.75	
Foremost to Pakowki, Alta.	22.30	
	23.05	
Central Canada.		
McLennan to Heart River, Alta.	47.60	
Edmonton, Dunvegan and British Columbia.		
Mileage 246.7 to 336.9	90.20	
Essex Terminal.		
Near Sandwich to Ojibway, Ont..	1.00	
Grand Trunk Pacific.		
Track on Saskatchewan River bridge, Prince Albert Branch..	0.20	
Halifax South Western.		
Jordan Falls Station to Jordan Falls, N.S.	1.29	
Hudson Bay (Dominion Government.)		
Mileage 197.4 to 241.24	43.84	
Intercolonial.		
Connection with National Transcontinental, Moncton	0.85	
Dartmouth branch Edenbrook to Upper Musquodoboit, N.S.	17.00	
	17.85	
Kettle Valley Lines.		
Between Midway and Merritt, B.C.	31.00	
Coquihalla River Section	33.00	
	64.00	
Pacific Great Eastern.		
D'Arcy to Clinton, B.C.	81.20	
Quebec Central.		
From mileage 5 east of St. Camille to English Lake	14.00	
St. John and Quebec.		
From Fredericton, N.B., south....	1.29	
Total	729.90	2,041.31
	1915.	1914.
Alberta	315.24	513.12
British Columbia	212.20	679.26
Saskatchewan	107.12	215.97
Manitoba	57.91	300.15
Nova Scotia	18.29	47.80
Quebec	16.00	52.51
New Brunswick	2.14	29.99
Ontario	1.00	200.01
Prince Edward Island		2.50
Miles	729.90	2,041.31

U. S. Census Figures.—Reference was made in Canadian Railway and Marine World for Feb., pg. 61, to Canada's remarkable tracklaying record, and comparison was made with the tracklaying in the U.S., using census figures to obtain certain averages. It was stated that the population of the U.S., according to the census of 1910, was 99,451,000. These figures were obtained from a semi-official source, but it has been discovered that a mistake was made, the figures of the 1910 census showing a population of 91,972,266.

Railway Development, Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta & Great Waterways Ry.—J. D. McArthur, President, in an interview at Edmonton Feb. 7, is reported to have said that after the completion of track laying into Fort McMurray, which it was expected to have done by Mar. 31, that the company's energies will be devoted to the ballasting of the line, and the completion of the necessary buildings, and that no further construction beyond Fort McMurray is contemplated at present.

The A.&G.W.R. is now receiving about 7,000 tons of 60 lb. steel rails, to complete an order for 25,000 tons given the Algoma Steel Corporation last year (Feb., page 49).

Athabasca & Fort Vermilion Ry.—The following telegram is said to have been received in Athabasca Landing, Alta., from C. F. Law, Vancouver, B.C., representing Lord Rhondda (D. A. Thomas), who is behind this projected railway:—"Everything all right. Official authority to proceed." What this telegram implies is known only to the company's agents, but probably the only manifestation of activity is the work of a survey party, and the preparation of a bill for presentation to the Alberta Legislature, providing for the guarantee of the company's bonds for the building of the line from Athabasca Landing to Fort Vermilion. A deputation from the district is being arranged to ask the Government to take charge of the bill. (Nov., 1915, pg. 437.)

Atlin Ry.—The Dominion Parliament is being asked to extend the time for the building of this projected railway from Atlin, B.C., southerly to where the Taku River crosses the International Boundary between British Columbia and Alaska. (July, 1914, pg. 323.)

Canmore Ry.—The Alberta Legislature is being asked to incorporate a company with this title to build a railway from the C.P.R. to No. 2 Mine, Canmore, with branches to the Georgetown Colliery and No. 1 Mine, Canmore, in Tps. 24 and 25, ranges 10 and 11 west of the 5th meridian. Clarke, Carson, Macleod & Co., Calgary, Alta., solicitors for applicants.

Central Canada Ry.—In an interview at Edmonton, Alta., Feb. 7, J. D. McArthur, President, is reported to have said it is expected to have the Hart River bridge completed by Mar. 31. The track will then be laid to Peace River Landing, and train service will be established through to that point from McLennan on the Edmonton, Dunvegan and British Columbia Ry. Plans are being prepared for the steel bridge to be built across the Peace River at this point, the estimated cost of the bridge being \$750,000. It will be a combined railway and traffic bridge. At present traffic is carried across the river by a ferry under the British Columbia Government's control, but is liable to be interrupted by ice. It is not intended to do any work on the bridge this year, but it is hoped to start construction in the spring of 1917. The province has guaranteed bonds for the construction of the railway for 50 miles beyond the Peace River, to the Waterhole district. Although the line has been located, according to Mr. McArthur's statement, no grading will be done this year, the only work to be done being the ballasting of the 50 miles from McLennan to Peace River, and the completion of the buildings on the line.

We are officially advised that surveys have been made for an extension of the main line from Peace River Crossing to the Alberta-British Columbia boundary, 10 miles; and that a branch line is under contract from mileage 101 on the Alberta & Great Waterways Ry. easterly for 10 miles. Surveys are being made for an extension of this branch from mileage 10 to the Alberta-British Columbia boundary. (Feb., pg. 49.)

Churchill Southern Ry.—The Manitoba Legislature has extended the time for the building of this projected railway from Fort Churchill to Kettle Rapids on the Hudson Bay Ry., with branch lines to any point in Manitoba. A motion to read the bill a third time in six months was defeated Jan. 28 by 38 votes to 3. (Feb., pg. 49.)

Dominion Government Ry. to Hudson Bay.—It was stated by Mr. Blondin, on behalf of the Minister of Railways, in answer to questions in the House of Commons, Feb. 3, that there had been expended on account of this railway to Jan. 6, \$15,465,304.70. Of this amount, \$10,446,592.90 was expended upon the railway proper, including \$683,166.75 on bridges, trestles and culverts, while there had been expended on harbors and approaches \$5,018,711.74, including \$163,012.30 expended upon bridges. There were 378 miles of grading completed and steel had been laid to mileage 242. It is expected that steel will be laid to Port Nelson early in 1917, and that the harbor will be ready for traffic, though incomplete, about the time the railway will be ready for operation. The Marine Department had expended \$21,293.96 on the project.

Delivery has commenced of 10,000 tons of 80 lbs. steel rails ordered for this line last year from the Algoma Steel Corporation and is expected to be completed by the end of March. They are being shipped by rail from Sault Ste. Marie to Pas, Man. (Jan., pg. 10.)

Edmonton, Dunvegan & British Columbia Ry.—Tracklaying is reported to have been completed to Spirit River, 357 miles from Edmonton, Alta. It is expected to extend the train service from McLennan to Spirit River Mar. 1. Tracklaying on the branch line from Spirit River to the Grand Prairie Settlement was started Feb. 1, and was expected to be completed by Mar. 31. This branch will be 60 miles long. J. D. McArthur, President, in an interview at Edmonton, Feb. 6, is reported to have said that no further construction will be gone on with after the completion of tracklaying this year, as the whole of the company's energies will be devoted to ballasting and completing the lines already graded. (Feb., pg. 49.)

Gananoque & Arnprior Ry.—The Ontario Legislature is being asked to revive the company's act of incorporation and to extend the time for the building of the projected railway from Gananoque to Arnprior, with branches from Morton to Lyndhurst, and from an unnamed point on the line to Ottawa. The lines are to be operated by steam, electricity or other motive power. Chrysler and Higgerty, Ottawa, solicitors for applicants.

The Grand Trunk Ry. has ordered from the Algoma Steel Corporation 1,100 tons of 90 and 100 lb. rails, in short lengths, for frog and switch purposes. Delivery is to be made within 6 month.

Grand Trunk Pacific Ry.—The grading of the Prince Albert Branch we are officially advised has been completed into Prince Albert, Sask., and track was laid across the bridge over the Saskatchewan River, at mileage 57 from Young, during 1915. A train service is being operated to this point. The distance from the river to Prince Albert is about 25 miles, but it has not yet been decided when track laying will be gone on with.

The Saskatchewan Government has approved of plans for the carrying by the Grand Trunk Pacific Saskatchewan Ry: of Coteau Ave., Morton Ave. and Fourth Ave., across its Weyburn Branch. (Feb., pg. 49.)

Great Northern Ry. Lines in Canada.—The Minister of Railways for British Columbia informed the G.N.R., Feb. 2, that the plans submitted for the new station on the False Creek flats, Vancouver, do not fulfil the requirements of the agreement. In an interview the Minister of Public Works is reported to have said: "No detailed plans have been submitted, but in the preliminary drawings our engineer has seen, it appears, that the value guaranteed by the G.N.R. is not there, and we are not going to pass the plans until the value mentioned in the agreement signed by the G.N.R. is shown. We certainly expect the G.N.R. to live up to its agreement and spend the \$500,000 agreed upon."

O. S. Bowen, of the G.N.R. engineering staff, was in Vancouver Feb. 1, and is reported to have said the contractors had been given plans for the foundation work of the new station, and were preparing to start work. The question of the new frontage was being considered, but no decision had yet been reached. The proposal is that the frontage be set 75 ft. further back from Main St. than the plans showed. (Feb., pg. 49.)

High River, Saskatchewan & Hudson Bay Ry.—The Dominion Parliament is being asked to extend the time for the building of this projected railway from any point in Tps. 25 to 28, range 1, west 4 meridian, Alberta, to Saskatoon, Sask., to the Saskatchewan-Manitoba boundary between Tps. 52 and 56, and on to Pas, Man. The provisional directors mentioned in the original act, passed in 1912, are:—H. N. Sheppard, F. Crandell, T. E. Le Claire, C. A. Gigot and G. D. Stanley, High River, Alta., where the head office is situated. (Dec., 1914, pg. 544.)

Intercolonial Ry.—F. P. Gutelius, General Manager, Canadian Government Railways, is reported to have said at a public dinner in St. John, N.B., recently that the entire surplus of the Intercolonial Ry., for the year, which was estimated at \$1,000,000, would be expended upon betterments. Referring to the question of elevator accommodation at St. John, he said the improvements contemplated ultimately made reconstruction of the elevator on the old location impossible, and he was of opinion that the remedy was the provision of a slip and elevator on the Reid's Point area.

In an interview at Montreal, Jan. 31, Mr. Gutelius is reported to have said it was hoped to begin doing business at the new terminals at Halifax, N.S., next year. The cutting on the new line round the city was about completed, and it was expected that the contract for the new

station buildings would be given out in the spring. If that were done, construction would be well under way by the end of the year. (Jan., pg. 10.)

Replying to a question in the House of Commons Feb. 17, the Minister of Railways said the cost of the new ocean terminals at Halifax, N.S., to Dec. 31, 1915, was \$4,745,632.56. As detailed plans for the finishing of these works have not been completed, and are subject to modifications, it is impossible to give any estimate as to the final cost.

The Kootenay & Alberta Ry. which runs from the C.P.R. Crows Nest branch, about a mile west of Pincher, to the coal mines of the Western Coal & Coke Co., Beaver Creek, Alta., about 13 miles, formed part of the Canadian Coal & Coke Co.'s property sold at auction at Calgary recently for \$3,000,000, the purchaser being the North American Collieries, Limited. The line was built in 1911-12, and was operated solely for coal traffic. (Oct., 1912, pg. 501.)

Magdalene River Ry.—The Quebec Legislature has passed an act confirming the charter of incorporation, and extending the time for building the authorized line from near Cap a la Ours, Gaspé County, to the Little Falls of the Magdalene River, thence to a connection with the Atlantic, Quebec & Western Ry.'s projected inland section. The provisional directors named in the act of incorporation passed in 1907 were:—C. W. Mullen, S. H. Boardman, Bangor, Me.; C. D. Laning, Boston, Mass.; J. O. Drouin, E. Brasseur, Montreal. (Dec., 1913, pg. 574.)

National Transcontinental Ry.—An order-in-council was passed Jan. 28 granting the N.T.R. Commission an area of 6.06 acres of land across the s.w. ¼ of sec. 35, Tp. 10, range 11 east of the first principal meridian, Manitoba, for right of way purposes. (Dec., 1915, pg. 470.)

Pacific Great Eastern Ry.—The Minister of Public Works for British Columbia recently completed a tour of inspection through the province, and in an interview at Victoria, Feb. 7, is reported to have said the question of the completion of this railway from Vancouver to Prince George was of primary importance to the Province. The assurance which he was able to give to the people along the route of the line that the Government was making plans to bring this to pass were heartily received. There could be no doubt as to the necessity of pushing the construction of the line as far as Prince George at the earliest possible date and subsequently to the Peace River country. The resources of the country through which the line was projected amply justified construction. The Government's plans would be laid before the Legislature, which is called to meet Mar. 2. (Feb., pg. 49.)

Quebec Bridge.—A press report states that with the erection of the main cantilever arm all the steel work on the north shore end of the bridge across the St. Lawrence River, near Quebec, has been completed. Practically all the steel work for the south shore section of the bridge is reported to be ready for erection and is expected to be completed ready for the erection of the cantilever arm in the spring. It is expected to have this arm built this year. The steel work for the suspended span is being got ready and it is expected to have it erected on scows during the year, ready for floating into position in the spring of 1917. If these operations are fulfilled it is probable that trains may be operated over the bridge in the summer of 1917.

The Canadian Pacific Railway's Remarkable Earnings.

The C.P.R.'s earnings statement for December, apart from phenomenal gains shown in both gross and net earnings for the month, as compared with Dec. 1914, is notable as bringing to a fitting climax what is in many respects the greatest six months in the company's history. Gross earnings for the half year fell short of the corresponding totals for both 1912 and 1913, but net earnings established a new high record, passing the 1913 figures by about \$2,400,000 and the 1912 figures by about \$2,500,000.

As a result of the remarkable showing made through the last three months of 1915, the company earned the equivalent of its full 7% dividend on the common stock, paid out of railway earnings, and with something to spare. Estimates of the half year's surplus can only be approximate, as factors enter into fixed charges and earnings which later go to special income account, for instance, which are not easily determined in mid-year. But taking the various items of the income account for 1914-15 and allowing a corresponding proportion for the six months to Dec. 31, there would have to be deducted for the half year, before common stock dividends, the following amounts:—

Fixed charges	\$5,223,255
Pension fund	62,500
To special income account	747,076
Preference dividend	1,613,638

Total

Deducting this from the \$29,624,187, shown as net earnings for the six months, there would be a balance of \$21,977,708, against the \$18,200,000 required for a full year's payment of the 7% dividend on the common stock. That is, if charges and other deductions are allowed for the six months to Dec. 31, on a proportional basis with corresponding items for the full year 1914-1915, the company had a surplus equal to approximately 8.4% on its common stock. In saying then that the full 7% dividend has already been earned, there is a margin for error of nearly 1½% or about \$3,700,000.

The figures for the first half of the company's fiscal year, as compared with 1914 show gains of 19.1% in gross and 50.6% in net as follows:—

	1915	1914	Increase
Gross	\$66,470,163	\$55,938,125	\$10,532,038
Exp.	36,845,976	36,264,549	581,427
Net	\$29,624,187	\$19,673,576	\$9,950,610

Gross earnings for the six months, as already noted, have been exceeded in two years in the company's history, but net earnings constitute a record. Figures for five years, gross and net are:—

	Gross.	Net.
1915	\$66,470,163	\$29,624,187
1914	55,938,125	19,673,576
1913	75,286,162	27,211,436
1912	73,526,191	27,131,152
1911	62,566,365	24,470,247

Although both gross and net earnings for Dec. naturally fell below the levels of Oct. and Nov., they were notable in two respects. For one thing both gross and net were the largest ever reported by the company for the month and for another the percentage gains passed the already remarkable increases reported in the months immediately preceding. As compared with Dec. 1914, gross increased \$5,261,711, or 70.7% and net \$3,502,797, or 159.4%, Dec. comparisons follow:—

	1915	1914	Increase
Gross	\$12,705,673	\$7,443,962	\$5,261,711
Exp.	7,003,351	5,244,438	1,758,913
Net	\$5,702,321	\$2,199,523	\$3,502,797

As compared with the best previous

Dec. on record, the final month of 1915 showed an increase of about \$500,000 in gross and of about \$1,300,000 in net. Dec. figures for five years follow:—

	Gross.	Net.
1915	\$12,705,673	\$5,702,321
1914	7,443,962	2,199,523
1913	11,814,325	4,226,821
1912	12,219,278	4,395,719
1911	10,654,871	4,105,730

In detail by months, since the opening of the current fiscal year, gross and net figures offer the following comparisons with a year ago:—

	Gross.	in year. Change	P.C.
July	\$ 7,895,375	—\$ 2,586,596	24.2
Aug.	8,801,451	— 1,116,312	11.3
Sept.	10,273,165	— 480,974	4.5
Oct.	13,443,214	+ 4,160,285	44.8
Nov.	13,351,283	+ 5,293,924	65.7
Dec.	12,705,673	+ 5,261,711	70.7

Totals

	Gross.	in year. Change	P.C.
July	\$ 2,800,403	—\$ 978,042	25.9
Aug.	3,442,314	+ 79,157	2.4
Sept.	4,745,300	+ 378,252	8.7
Oct.	6,579,434	+ 3,258,105	98.1
Nov.	13,351,283	+ 5,293,924	65.7
Dec.	5,702,321	+ 3,502,797	159.4

Totals

Manitoba Public Utilities Commission—In connection with the appointment of P. A. MacDonald as Commissioner, which was mentioned in Canadian Railway and Marine World for Feb., we are officially advised that he will be assisted by an expert engineering staff, following the system in vogue in certain of the United States, where public utility laws have been more fully advanced. This staff will not only be servants of the commission in aiding investigations, and in settling technical disputes, but will also be available for the purpose of conferring with and advising on operation of telephones, gas, electric and water supply systems whether private or municipal, as to matters arising in the course of business. By this means the Commissioner will be relieved of the hearing of conferences between persons interested in purely technical matters, which has heretofore been found to increase the burden of his office.

Woodsmen's Battalion.—At the British War Office's request a Canadian foresting battalion is to be formed under Lt.-Col. Alex. McDougall, railway contractor, Ottawa. B. R. Hepburn, M.P., for Prince Edward, Ont. and formerly President, Bay of Quinte Steamship Co., will probably be one of the majors. Canadian woodsmen are wanted at once in Great Britain for timbering operations in connection with war requirements. Lumber is at an almost prohibitive price there, and ocean rates practically stop export from Canada. In Great Britain there are still large resources of standing timber which can be cut down and utilized for building operations, trench construction work, etc. It is planned to raise companies of experienced woodsmen from British Columbia, Alberta and northern Saskatchewan, the Ottawa Valley, Quebec and New Brunswick.

Prince Edward Island Ry.—It transpired in an action in the Queen's County Court, Charlottetown, P.E.I., recently, that the P.E.I. Ry. was not included as a Dominion Government railway in the statute respecting actions against the Government railways. The action was to recover \$140 damages for fire alleged to have been caused from a locomotive on the Murray Harbor branch.

Unprecedented Weather Conditions in the West.

The prairie provinces and British Columbia in Canada, and the United States territory southerly thereof as far as San Francisco, experienced during the last week in January and the first week of February the heaviest snowfalls and the most severe cold weather that has occurred for many years. The first snowfall covering practically all of this territory occurred between Jan. 21 and 24, and terminated in some parts of the area with rain. The fall of snow was particularly heavy, and with the low temperature, which accompanied the rain, in the coast regions, the snow was turned into an icy mass, making its removal difficult. The second storm, which was particularly severe in British Columbia, and the State of Washington, occurred Jan. 31, and Feb. 1, Vancouver reporting a continuous fall for 38 hours, while in Seattle, Wash., 18 inches of snow fell.

Electric railway traffic in all the Canadian western cities was interrupted, and steam railway trains were stalled all over the territory. So far as electric railway traffic was concerned the Brandon Municipal Ry. was worst hit. The council ordered the stoppage of traffic on Jan. 27, and the laying off of the conductors and motormen until the streets were cleared. In Winnipeg, Regina, Saskatoon, Calgary, Edmonton and Lethbridge and the British Columbia Electric Ry. the services were kept up, without very much delay, the railways having the necessary appliances to keep the tracks clear. General Superintendent Murrin of the last company reported, Feb. 12, that the snow clearing in Vancouver cost \$13,546. Between Jan. 6 and Feb. 9, the company's snow clearing equipment was being operated to its full extent on 24 days, running 4,149 miles in Vancouver, and 3,000 miles on the interurban lines. During the worst period 300 men were at work in the snow clearing gangs. The only real delay on the company's mainland lines was one of a couple of hours on the Burnaby Lake Branch, where owing to the weight of icy snow a section of trolley wire came down.

On the steam railways, while there was a general stallage of trains at various points on the lines during the first storm, there were not any very great delays on the Canadian Pacific and the Grand Trunk Pacific's prairie lines. The first named of these companies reported traffic normal Jan. 27, and to have been very little interrupted by the second storm. This applies to the British Columbia Division equally with the prairie divisions. West of the prairie provinces the G. T. Pacific traffic appears to have been held up for about a week. The Canadian Northern Ry. appears to have been hit the worst, the heaviest obstruction being in British Columbia, the lines in the prairie provinces being cleared with comparatively short delays. One report stated that for 200 miles the C.N. Pacific was a mass of snow and ice over a foot thick, which would have to be removed with pick and shovel. A number of trains in the prairie provinces were cancelled, and the traffic on the line in British Columbia was practically closed temporarily. The train with passengers from Winnipeg, Jan. 28, was held up on the Boston Bar section, B.C., and the passengers reached Vancouver Feb. 12, having been transferred across the Fraser River by an aerial cable and carried over the C.P.R. One of the passengers was M. H. MacLeod, General Manager and Chief Engineer, who reported 200 men with a

rotary and two other snowploughs between Pyramid and Lucerne, and gangs at work near Boston Bar and at other points. The drifts he said ran up to 30 ft. in depth, and with the changing character of the weather had packed in such a way that much of it had to be moved with pick and shovel, but the line was cleared within a few days, sufficient to allow trains to go through, and although the conditions in Canada were bad, those in the States appear to have been worse, as following the snow and the frost came a sudden thaw, which brought on mud slides on the Great Northern Ry., and other obstructions to traffic on other lines. The first train into Vancouver over the Great Northern got in Feb. 11, but prior to that passengers had been taken round the mud slides, to a second train, and then on to Vancouver.

So far as branch line traffic was concerned conditions were worse, as the chief attention of the officers of the companies was necessarily given to the opening up of the transcontinental lines. One Canadian Northern branch line is reported to have been blocked since Jan. 5, and other lines of this and the other companies, from 5 to 15 days. The result of this, following the congestion of freight traffic at the divisional points, passenger traffic being given the preference, caused almost a coal famine throughout the west.

The Pacific Great Eastern, between Squamish and Clinton, was blocked by the first storm, and as the company has no snowplough or other similar equipment, traffic was abandoned.

On Vancouver Island the conditions were not much different. The British Columbia Electric Ry. was able to maintain a service in Victoria, although some of the streets remained blocked from Feb. 1 to 3, and the Saanich Peninsula line was not opened up until Feb. 11. Traffic on the Esquimalt & Nanaimo and the Victoria & Sidney Railways was abandoned Feb. 1, but the lines were opened up again within a week.

Track Elevation or Depression in Hamilton.

The question of the elevation or depression of the Toronto, Hamilton & Buffalo Ry. tracks in Hamilton, Ont., which has been under consideration for a couple of years, has been advanced a stage by the report of G. A. Mountain, Chief Engineer of the Board of Railway Commissioners, a copy of which has been sent to the City Engineer.

Mr. Mountain discusses the elevation and depression plans, pointing out the merits and defects in each, and making suggestions in regard to them, and concludes: "In summing up, and taking everything into consideration that I can think of, I am of the opinion that if grade separation is to be made at this point, then in the greater interests of all parties track elevation is the proper method for economy of operation, business interests adjoining the railway, and for relief from the smoke nuisance, but I do not think that the T.H. & B. business at present through the city of Hamilton with gates protecting practically all its level crossings and with half interlockers protecting the electric car systems at crossings with the T.H. & B. warrants any change being made in the location of the tracks. I would add that there is an objectionable feature in the way that

the smoke comes out of the tunnel after trains have passed through, particularly at the portal next to James St. It can be noticed curling for some time after the train has passed through and is objectionable. I would suggest that the company consider the advisability of putting a shaft near the upper end of the tunnel, which is the easterly portal, and fanning the smoke up into the air where it disperses instead of it coming out of the roof of the tunnel and flowing over Park St. This is merely a suggestion which might be looked into."

Railway Profiles to be Based on Mean Sea Level.

The Board of Railway Commissioners general order 157, published in Canadian Railway and Marine World of Feb., has been rescinded and general order 157, dated Jan. 31 substituted of it, as follows:—Re matter of proposal that profiles of railway companies, whose lines commence at, terminate at, or intersect with, any of the lines listed in the work entitled *Altitudes in Canada*, edited by James White, Assistant Chairman, Commission of Conservation, including the lines of the said companies which touch tidewater, be based upon mean sea level as provided in *Altitudes*. Upon reading what is filed on behalf of the Canadian Pacific, Canadian Northern, Grand Trunk Pacific, and Grand Trunk Railway Companies, the said companies consenting to the proposal, and the report and recommendation of the Chief Engineer of the Board. That, on and after Feb. 1916, all profiles submitted by railway companies, which commence at, terminate at, or intersect with any of the lines listed in *Altitudes*, as well as those which touch tidewater and are not listed, be based upon mean sea level, as provided in *Altitudes*.

Port Mann Shops, Canadian Northern Ry.—Following is a list of machinery which has been procured by these shops to meet immediate requirements, and which will be added to as necessity arises: 80 in. driving wheel lathe; 26 in. x 36 in. x 14 ft. gap engine lathe; 24 in. upright shaper; 30 in. upright drill; stationary engine; 20 in. x 12 ft. engine lathe with quick change gears; 16 in. x 8 ft. engine lathe, with quick change gears; 48 in. car wheel boring machine; 84 in., 300 ton hydraulic wheel press, inclined type; single axle lathe for journal turning; 4 ft. plain radial drilling machine; 1,150 lb. single frame, steam hammer; pneumatic drop pit jack; straight line, compound steam driven air compressor with one A-39 and A-36 air and steam regulating valve for automatic control of steam supply; variety saw M-275 with tilting table; 2 in. triple head bolt cutter; No. 9 steel pressure blower with countershaft; 2 only, No. O O S, 38 x 42 stationary blacksmith forges with tank; 36 in. band saw; 24 in. pony planer.

British Columbia Halibut Fisheries.—During 1915 there were landed at five British Columbia ports 25,866,000 lbs. of halibut, valued at \$1,557,960, or about 42% of the total catch on the North Pacific Coast. Over 15,000,000 lbs. of this catch was landed at Prince Rupert, representing the major portion of the catch of 100 vessels which now make that port their outfitting station, and was shipped via Grand Trunk Pacific Ry. This portion of the trade, prior to the opening up of Prince Rupert and the G.T.P. Ry., went to Seattle, Wash.

Freight and Passenger Traffic Notes.

Magnolia is the name of a new Grand Trunk Pacific station at mileage 855 west of Winnipeg.

During the summer, weekend (Saturday to Monday) excursions will be run from Toronto to allround Muskoka Lakes and return at \$5.

The G.T.R. informs all ticket agents that tickets must be filled in with ink and not with indelible or other pencil. Reports on tickets must also be made out in ink.

The Canadian Government Railways has issued a folder containing the timetables of all the lines operated for the Dominion, viz., the Intercolonial, the National Transcontinental and the Prince Edward Island Railways.

The Canadian Northern Ry., according to a western press dispatch, has raised the embargo on grain shipments to Port Arthur in that it will now accept shipments consigned to Canadian Northern elevators at Port Arthur.

The Canadian Northern Ry. will probably make its transcontinental passenger service between Toronto and Vancouver daily beginning June 1, instead of three trains a week each way as at present.

The Canadian Northern Ry. has had in operation two agricultural trains for short course lectures in conjunction with the Alberta Government up to Feb. 23, and a similar train in Saskatchewan started a route on the Goose Lake Branch Feb. 29, to run to Mar. 14.

W. Eastland was fined \$20 and costs by a Vancouver, B.C., magistrate recently for selling a railway ticket in contravention of the Railway Act. He lent some money on the security of the ticket and was afterwards told to sell it for what he could get, the original holder of the ticket sending a purchaser.

In a recent interview at Edmonton, Alta., J. D. McArthur, President, Edmonton, Dunvegan and British Columbia Ry., said that after Apr. 1 three trains a week in each direction would be run between Edmonton and the Spirit River, 357 miles, and that it was expected to put a similar service on the branch from Spirit River to Grand Prairie by Aug. 1.

The C.P.R. through service between Nelson and Revelstoke, B. C. via West Robson has been temporarily discontinued owing to the conditions on Arrow Lake, and through passengers are being carried via Slocan. A local steamboat service is being operated on Arrow Lake between West Robson and Edgewood three times a week.

The Vancouver City Council decided, Feb. 1, to appoint a sub-committee to investigate Canadian Northern Pacific Ry. freight rates, in connection with the application being made to bring the railway under the Board of Railway Commissioners jurisdiction. The Vancouver Board of Trade has passed a resolution deprecating the city's action, and it is not unlikely that it will be stopped.

The Pacific Great Eastern Ry. announced Jan. 28, that it would have to abandon for an indefinite period the operation of trains on its Squamish-Clinton section. The heavy snowfalls of the end of January completely blocked the line, and it cannot be cleared without the aid of a rotary snowplough. As the other railway companies are using all such equipment on clearing and keeping their own lines clear, it is impossible to borrow one.

The Vancouver City Council decided, Feb. 4 to postpone for the present its application that the Canadian Northern Pacific Ry. be declared to be a railway for the general advantage of Canada and therefore subject to the Board of Railway Commissioners as to rates. The Vancouver Board of Trade on Feb. 9 passed a resolution asking the Provincial Government to appoint a Board of Railway Commissioners to have authority over all railways within the province subject to provincial control.

Replying to a question in the House of Commons, Feb. 3, Dr. Reid, on behalf of Minister of Railways said: There are through rates on lumber from all points on the National Transcontinental east of the St. Lawrence River; also from such points west of the river to Hearst, Ont., inclusive, from which lumber is likely to be shipped to points on the G.T.R. in Quebec and Ontario. No through rates are yet arranged to points on either the C.P.R. or Canadian Northern Ry. in Quebec and Ontario.

Passengers for Australia, who are not Canadians or other British subjects, now require passports to secure their admission to Australia and it is desirable that such passengers for New Zealand also provide themselves with passports. Round trip passengers for Australia and for New Zealand as well, whether they are Canadian or other British subjects or of United States or other foreign citizenship, require passports to permit of their leaving Australia or New Zealand on the return trip and should provide themselves with such documents before setting out.

The Canadian Pacific Ry. has given notice that agents at Chicago, Ill., St. Paul, Minn., and Fort William, Ont. and east thereof, will secure reservations for the Canadian-Australian Steamship Line from W. H. Snell, General Passenger Agent, C.P.R., Montreal, instead of from C. E. Benjamin, heretofore General Passenger Agent, Trans-Pacific Service, Montreal, and now G.P.A., Canadian Pacific Ocean Services Ltd., Montreal. Agents west of Chicago, St. Paul, St. Louis, and Fort William will continue to apply to J. C. Irons, General Agent, Canadian-Australian Line, Vancouver, B. C.

The Lake Erie and Northern Ry's timetable shows an hourly service every day, starting at 7 a.m., from Galt, and at 8 a.m., from Brantford, Ont., and continuing until 8.55 p.m. from Galt, and 10 p.m. from Brantford. With the exception of the first train in the morning, all the trains from Galt start five minutes before the odd numbered hours, while the trains from Brantford start on the even numbered hours. The timetable for Sundays is the same, except that the first train from Galt is at 8.55 a.m., and from Brantford is at 10 a.m. There is a connection with the Galt, Preston and Hespeler St. Ry. on Sundays, the cars running to and from Concession St., Galt. The line, which is an electric one, was opened for traffic Feb. 7.

The G.T.R. is appealing against being assessed for local improvements in London, Ont., alleging that the asphalt pavements and cement curbs on certain streets were put in for the benefit of the London & Port Stanley Ry., and that its properties are rendered inaccessible by the L. & P. S. Ry. tracks.

Lumber Rates from Beaudette, Minn. to Vincennes, Ind.

The Interstate Commerce Commission at Washington has given the following decision, dated Jan. 3, in the case of Bradley Timber and Railway Supply Co. vs. Canadian Northern Ry. Co.—Complainant is a corporation dealing in lumber at Duluth, Minn. By complaint, filed Nov. 26, 1914, it alleges that defendants' rate of 27c. per 100 lbs. for the transportation of a carload of lumber shipped from Beaudette, Minn., to Vincennes, Ind., Feb. 18, 1913 was unreasonable to the extent that it exceeded 26c. per 100 lbs. Reparation is asked. The shipment weighed 33,900 lbs. and charges were collected of \$91.53 at the 27c. rate assailed. Effective Apr. 1, 1913, defendants voluntarily established a rate of 26c. Previous to that date the rate from Beaudette to Chicago had been reduced by 1c. per 100 lbs.; and it is because the through rate from Beaudette to Vincennes was not reduced equally at the same time that this complaint was filed. For a number of years the rate to Vincennes had been made with some regard to the rate to Chicago. When the rate to Chicago was reduced the rate to Vincennes still was lower than the combination of the intermediate rates to and from Chicago by ½c. per 100 lbs. Effective Nov. 16, 1913, the rate to Vincennes was increased to 26½c. Complainant adduced no evidence relative to the unreasonableness of the rate assailed other than the changes in the rates to Chicago and Vincennes just described. We find that the rate charged is not shown to have been unreasonable, and an order dismissing the complaint will be entered.

National Transcontinental Ry. Transcona Shops.—The Minister of Railways informed the House of Commons recently in reply to a question by Hon. G. P. Graham, that the portion of the National Transcontinental shops at Transcona, Man., not required at present in connection with railway operation, being about one-twentieth of the floor space, and comprising the frog shop, and the south bay of the freight car shop, had been leased to the Transcona Shell Co., the lease being in the names of G. R. Drenon, President, and W. A. Petrie, Secretary. The space is being used for the manufacture of shells, the company paying \$6,780 a year, and the insurance premium on \$113,000, together with a rental for any machinery used calculated at 20 on the value of the machinery. No machinery can be used without the General Manager's approval. The first year's rental of \$6,780 had been paid.

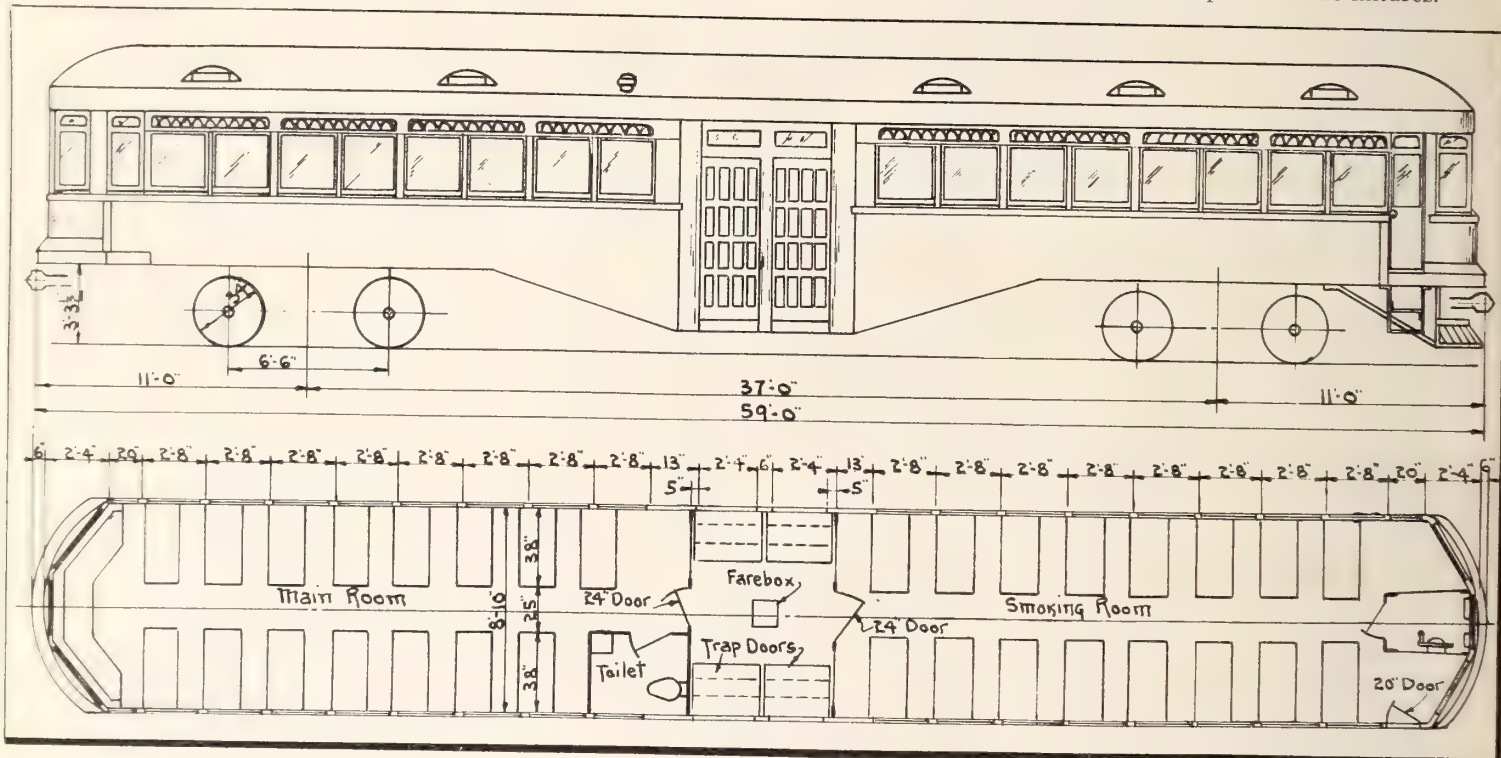
New Dominion War Taxation. In his annual budget statement in the House of Commons, Feb. 15, the Minister of Finance announced a new tax of 25 per cent. on the profits of incorporated companies in which a capital of over \$50,000 is engaged, exceeding 7 per cent. on the paid up capital stock, computed on every accounting period after Aug. 4, 1914. Included in the businesses covered, is that of transportation, whether continuously carried on or not. Any further issues of stock, or other increases of capital, or any changes therein, having the object, or the tendency, to increase the capital stock, made after Feb. 15, 1916, are subject to the minister's decision as to whether it is fair and proper to include such, when determining the company's capital and his decision is to be final.

Electric Railway Department

Length over buffers	59 ft.
Length over ends	58 ft.
Width over steel sheathing	8 ft 10 in.
Width overall	9 ft.
Height from top of rail to underside of side sill at bolster	3 ft. 2½ in.
Height from rail to top of first step tread	1 ft. 4½ in.
Height of step risers	10½ in.

the longitudinal member to the end member. The buffer beams are formed from 5 in. rolled steel channels, bent to proper contour, with flanges turned outward and projecting 6 ins. beyond the end sheathing. The tops of the buffer beams are flashed with sheet steel, which is bevelled upward forming an angle of 45 degrees. The body bolsters are of built up construction, with top and bottom cover plates 15 ins. wide, the first being 5/16 in. thick and the latter 3/8 in. The bolster diaphragm web plates are 3/16 in. thick stiffened top and bottom with 2 1/2 ins. by 2 1/2 ins. rolled steel angles.

body sashes are of the raising type and single storm sashes are also promised for side windows. The centre window in front vestibule is divided in two parts, the upper one made to drop and with provision for holding it at different heights. The two corner windows in each end are made to drop and are not provided with cross bars. Five automatic ventilators are provided in each compartment and one globe ventilator in lavatory. All of the side windows are fitted with pantasote curtains, mounted on 1 in. diameter concealed metal rollers and provided at the bottom with pinch handle fixtures.



Interurban Cars for Toronto Suburban Railway.

There are the usual walkover seats in the passenger and smoking compartment, an emergency exit door at motorman's end, right hand side, and the fare box is located in the centre of the car, making it possible to take full advantage of the large double door openings, which permit loading the maximum number of passengers found at any stopping point without the delay incident to undue crowding in discharging or receiving passengers. The cars are designed especially for through service and provided for single end operation only.

The design of the steel framing presents a striking feature in the omission of continuous centre sills between buffers. Although this constitutes a novelty for interurban service it conforms to the most modern practice in the design of side-girder steel cars where light weight is imperative and single car operation is contemplated. The main centre longitudinal members at each end, extending from buffer beam to bolsters, consist of 5 in. rolled steel channels spaced 16 ins. apart, back to back. Rolled steel angle braces extend diagonally from the intersection of the first crossing member and

The side framing is built up from 5 ins. rolled steel channel side sills, 2 x 1½ x ¼ in. rolled steel T iron side posts, so formed in one piece as to maintain the roof contour and join both side frames. Insulation is provided by a 1 in. thick wall of cork. The side and end sheathing and letter board plates are of No. 12 B. & S. gauge rolled levelled steel with double splice plates of ½ in. steel. All rivets in side and end frame above side sill are 5/16 in. diameter, the under frame rivets throughout being ¾ in. in diameter.

A turtle back roof is employed, formed by extension of steel side posts and wooden carlines spaced 9 ins. centre to centre and sheathed with $\frac{3}{4}$ pine and covered with No. 10 cotton duck laid in white lead and oil. The centre entrance steps are formed as part of the framing and are simply covered with composition treads 4 ins. wide. The interior finish of the car is of cherry and designed to have smooth flat surfaces so far as is possible. The transom and bottom panels of centre bulkheads are of steel, painted cherry color on both sides. Headlining throughout is of three ply poplar veneer. All

Thirty one walkover seats and one circular seat in two sections in the rear end are provided. Each seat is fitted with a stationary foot rest and polished bronze hand hold on the aisle end of the back. Smoking compartment has low back seats upholstered in green pantasote and the main compartment has high back seats with head roll and is upholstered in green plush. The cars are wired for lights, trolley control, heaters, headlights and air brake equipment, all of which is placed in conduit and insulated for 1500 volt d.c. operation. A foot gong 12 ins in diameter is placed under front platform. Signal bells are placed in motor-man's compartment, near fare box, with cord running along the centre of car entire length. Annunciator push buttons are furnished for each seat with connection buzzers near fare box and in motor-man's compartment, a switch being provided on the buzzer circuit wiring, so that it can be cut in or out by the conductor. Continuous basket racks and polished bronze trimmings are provided throughout. Drawbars are fitted to each end of car. Steel pilot is provided at motor-man's end of car, connected to body. Two

pneumatic sanders are provided per car.

The trucks are of following dimensions: Wheelbase, $6\frac{1}{2}$ ft.; diameter of wheels, 34 ins. (rolled steel); axles, journals, $4\frac{1}{4}$ x 8 in., M.C.B. The cars are being built by Preston Car & Coach Co.

The Ontario Railway and Municipal Board and Toronto Railway Cars.

On Nov. 9, 1914, the Ontario Railway and Municipal Board, in announcing its conclusions on a special report obtained as to the service furnished by the Toronto Ry. Co., and the requirements of the City of Toronto, required, among other things, that the company provide by June 30, 1915, 50 double truck motor cars of a design to be approved by the Board.

The chief objects which it was the aim of the parties to achieve, included the elimination of overcrowding on the cars, and of the outside running board on the summer cars. In the early part of 1915, the company equipped one of its cars with cross seats and a centre aisle, and six of its cars with half of the seats on each side, across the car and the other half arranged longitudinally, with a cross over aisle. Owing to the narrow devil strip between the tracks on the Toronto streets, the cars used are of necessity about a foot narrower than those on most of the large electric railways in Canada and the U. S. This causes considerable difficulty in planning a seat layout to introduce cross seats and to provide a sufficient width of aisle. On Apr. 30, the Board held a meeting to consider plans of cars, when it was stated that the company was proceeding to build cars according to the plans without having received the Board's sanction. It was stated that two were then built, and 18 were in course of construction. The Chairman of the Board announced that if the company built the cars without the Board's approval, it did so at its own risk, and the hearing was adjourned. On May 17, the matter again came before the Board, and plans were submitted by the city showing a composite type of car, and for the reconstruction of the existing type. The Toronto Ry. desired further time for the consideration of these plans, and the Board reserved judgment, deciding to leave it to its engineer, the City Engineer and an official of the company.

After some consultation, these officials arranged an existing type of car with cross seats on one side and a longitudinal seat on the other, the car body being set on the trucks, somewhat off centre, to obtain a little extra width without endangering passing cars. Although a car of this type, if adopted, would do away with the outside running board and the passenger capacity would be less than the existing type, the Board decided, Oct. 1, that the company must have 25 of these cars in operation by Dec. 1, subject to some slight alterations to the satisfaction of the Board's engineer. On Nov. 22, the Board in the meantime having relieved the company from the obligation of having the seats on its open summer cars so arranged that the passengers face forward, with an aisle through the centre of the car of sufficient width to allow the conductor to pass for the collection of fares, issued an interim order abolishing the running board and ordering the city and the company to confer within 30 days, as to the best type of car to be used, and if they failed to agree, the city would be given an additional 15 days to submit its plans. The

city declined to confer with the company on the subject and the Board, after further considering a report of its engineer on tests made with the experimental composite car, ordered on Jan. 25, that its order of Oct. 1, 1915, be rescinded, and that 25 of the double truck cars shall be of a type and character of construction as recommended in the report of its engineer, dated Jan. 11, 1915, and that these 25 cars shall be in operation by Mar. 1. A further order was issued Feb. 7, requiring that the balance of the 50 double truck cars, shall be built with the greatest possible interior width, having regard to the limitations imposed by the tracks and devil strip, and of a design to be approved by the Board on the recommendation of its engineer, and that they be placed in operation by May 15.

The first 25 cars have been built, and it was expected, when this was written, that they would be in operation on Mar. 1, as ordered. The second 25 are being proceeded with, and will be of the same type. The only difference between the two lots will be a few inches of extra interior width in the second lot.

The first 25 cars of the order of 50 will be practically the same as what is known as the palace car type. Numbered from 2,014 up, the only difference will be that the sections of the removable side will be permanently fastened and there will be ventilators placed in the upper parts of the windows. The seats will be longitudinal. The second 25 will be similar with the exception that they will be slightly wider cars, probably $2\frac{1}{2}$ inches.

The Winnipeg Electric Railway and Automobile Collisions.

A communication on street accidents was submitted to the Winnipeg City Council, Feb. 7, on behalf of the Winnipeg Electric Ry. as follows:—

"The report of our accident department for 1915 contains a comparison in respect to street accidents with 1914, which is of such a nature that I feel it my duty to bring it to your attention. It is as follows: Increase in automobile collisions, 38 per cent; decrease in pedestrians struck, 10 per cent.; decrease in all other vehicle collisions (includes bicycles, rigs and animals), 34. Our statistics show that automobile collisions are increasing altogether too rapidly, and our men are powerless to prevent them. This is evident when the great decrease in other classes of accidents is considered. The strictest observance of safety first principles by our men has failed to accomplish a reduction in the number of automobiles colliding with street cars. In 1915, 494 collisions with automobiles were reported by our men, an average of 41 a month; but, in Nov. and Dec. 1915, a total of 108 automobile collisions were reported, an average of 54 a month. On this basis we may expect 648 automobile collisions in 1916, if some exceptional steps are not taken by the council to control the operation of automobiles in the city. We are doing everything in our power to reduce the number of accidents occurring in connection with the street cars, and have almost entirely eliminated accidents to passengers. We feel, however, that collisions with automobiles are beyond our control under present conditions. Street cars operate along fixed rails, and cannot deviate from them. With co-operation on the part of owners and drivers of automobiles, such as we have had from owners and drivers of other vehicles, there is no reason why automo-

bile collisions should not decrease in the same ratio as other accidents. I note in the newspapers there is some agitation for an increase in the speed limit. In view of the foregoing facts, I would suggest that it would be very inadvisable to permit any increase in the speed limit within the city."

London and Port Stanley Railway Summer Traffic Rates.

At a meeting of the London, Ont. Railway Commission, Feb. 4, a decision is reported to have been reached to purchase the incline railway at Port Stanley, and to enlarge it so as to be able to handle the increased traffic anticipated during the coming summer. It was decided that a new schedule of rates will become effective May 24, to continue until after the Western Fair. The present 30 cent return excursion fare from London to Port Stanley on Wednesday and Saturday is to be continued, as the report states, but the rate on other days is to be reduced to 40c. for adults and 20c. for children. The payment of an additional 5c. will give the holder a rate up and down the Port Stanley Incline Ry. graph and cable companies, were resumed London and Lake Erie Ry. and Transportation Co., was present at the meeting and asked the commissioners not to reduce the rates. He pointed out that his line could not compete with the L. and P. S. Ry. The proposed rate would mean that his line would have to carry the through passengers at $\frac{1}{2}$ c. a mile. The present cost of operating a car is $16\frac{1}{2}$ c. a mile, or \$9.60 for the round trip, and the carrying capacity of the cars permits the earning of \$16 on the round trip, provided that every seat is occupied. The company's franchise provides that any rate given out of London should also apply for the benefit of travellers from Port Stanley to London.

Ottawa Traction Company's Annual Meeting.

The Ottawa Traction Co's annual meeting was held in Ottawa Feb. 7. The report, which included the Ottawa Electric Ry. Co's operations, and which is given in full further on in this issue, showed a falling off of about 1,000,000 passengers compared with 1914, owing principally to war conditions. Commencing with August, earnings began to show an increase over the previous year, which has continued each succeeding month. The percentage of operating expenses to receipts was $61\frac{1}{5}$ per cent. in 1915, against $60\frac{3}{5}$ per cent. in 1914.

The directors for the current year are: Thos. Ahearn, President; W. Y. Soper, Vice President; Jas. D. Fraser, Secretary-Treasurer; T. Workman, E. N. Soper, T. F. Ahearn, Redmond Quain, J. F. Smellie, G. P. Murphy. The only change in the Board was the election of G. P. Murphy to fill the vacancy caused by the death of Travers Lewis, K.C.

The Saskatoon Municipal Railway officials under the recent organization are: G. D. Archibald, Superintendent; J. P. McKenzie, Assistant Superintendent, and L. V. Clare, Secretary.

The deferred cable messages, which, owing to congestion of business, were discontinued a few weeks ago, by the telegraph and cable companies, were partially resumed at the end of January.

Calgary Municipal Railway Wage Schedule.

The Calgary, Alta., City Council has approved of a new wage schedule and agreement with the Calgary Municipal Ry. employees. The existing agreement expires in April, and the new agreement and schedule have been drawn up by the commissioners and by the committee of men representing the employees. The commissioners' report to the council sets out that the new wage schedule is the same as that now in force, except that there is a small increase in the case of men operating the one-man cars in the downtown district.

"The city has asked the men to forego the time and a quarter which has been paid for Sundays and time and a half for overtime. It has been a considerable burden to the system during these hard times having to pay this extra time on Sundays, consequently the service has been curtailed. In lieu of this concession made by the men we propose to operate a regular car service on Sundays (without extras), which should increase the revenue and will give the men six days work per week. This improvement of service will be of mutual benefit to the

Lake Erie and Northern Railway Operation.

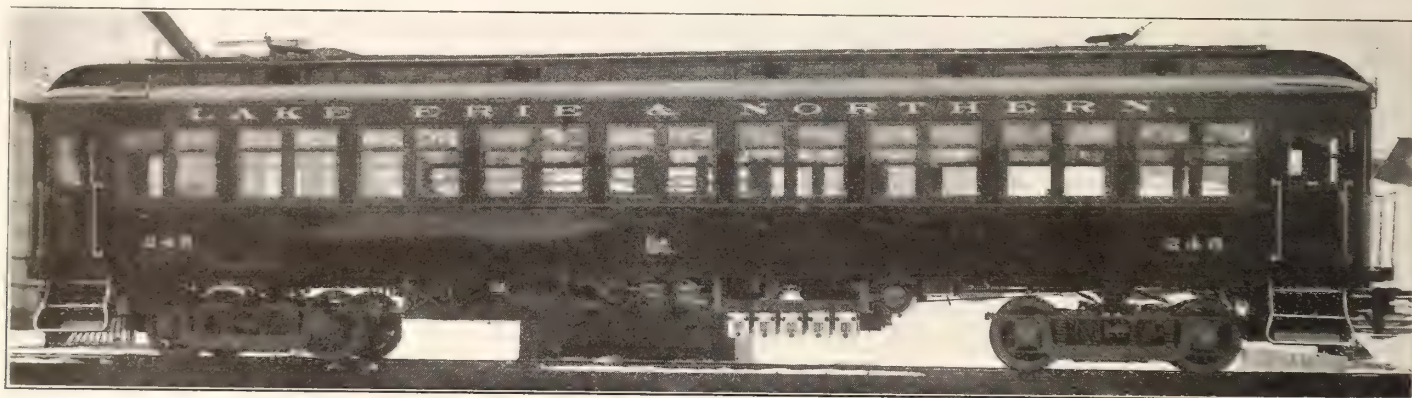
The L.E. and N. Ry. started operating the Galt-Brantford section of its new electric railway, Feb. 7, the first train leaving Galt at 7 a.m. The service at present is a two hour one, the cars leaving Galt on the odd hours and Brantford on the even hours. It said that as soon as a connection is made with the Dominion Power and Transmission Co.'s line from Brantford, which will probably be early in March, that the service will be made an hourly one. The service put in operation Feb. 7, was for passengers only, but it was expected to put a freight service in operation later.

The line starts at the Soap Works in Galt, and follows the Grand River to Paris, running more or less parallel with the Grand Valley Ry., the right of way of which has been acquired by the company from the city of Brantford. In Paris the line leaves the river valley and follows the top of the bluff overlooking Paris from the east. On this bluff is the Paris station, which is built to C.P.R. standard plans. From Paris to Brantford the line continues to follow the Grand River, although there are a couple

each meeting attended, but the total remuneration receivable shall not exceed \$800 in any one year, while the chairman shall receive \$15 for each meeting attended, but not more than \$1,200 in any one year. The board to have exclusive control of the whole of the public utilities; to appoint a general manager, submit monthly reports to the Council, and pass all necessary bylaws, but to apply to the Council to pass bylaws for the raising of money for additional capital expenditures. The report of the committee as adopted has been forwarded to the council for consideration.

The Mayor of Edmonton, Alta., called the attention of the City Council on Feb. 2, to the fact that the outstanding bonds issued in respect of the Edmonton Radial Ry., amount to \$56,041 a mile of track, whereas under the powers of the act of incorporation of the E.R.Ry., the amount of the securities issued is limited to \$10,000 a mile. The matter was referred to the city charter committee to take the necessary steps to have it set right by the Legislature.

The Edmonton, Alta., city commissioners on Feb. 2, increased the salary of Superintendent Moir of the Edmonton Radial Ry. from \$150 to \$200 a month and approved of the estimates for the



Lake Erie & Northern Railway Car.

The illustration above shows one of the eight full vestibule interurban passenger cars put in service recently on the L. E. & N. R. and which were fully described in Canadian Railway and Marine World for February, pg. 67.

patrons as well as the street railway men." The Council approved the recommendation that the new schedule go into operation Feb. 1, the commissioners estimating that the saving effected by it would amount to \$5,256 during the year. The commissioners' report as to the wage schedule is as follows: "To employees in the service on this date and from the date other employees enter the service, under this agreement, after one year employment under emergency contract at 26c. an hour in any capacity on the system, and are qualified conductors and motormen, the wage schedule until the end of this agreement shall be, including police duty, first year 28c. an hour; after first year 30c.; after two years 33c.; after three years 35c."

When in charge of one-man cars (not including trailers or Ogden extra service), operating from outside to any point within the boundaries of Eighth Ave., Eighth St. west, Seventeenth Ave., Second St. east, 40c. an hour will be paid. Pay day for the employees shall not be later than the 6th and 21st of each month. Fifty cents will be allowed all employees for their attendance at lectures on street railway practice once a month, and also extra half time on May 24, Dominion Day, Civic holiday, and Labor Day, Good Friday and Thanksgiving Day, and extra full time Christmas Day and New Year.

of stretches where the river is not to be seen from the car. As Brantford is approached the line again runs close by the stream. The entrance into Brantford is through the Holmedale section of the city, and the only Brantford street to be crossed by the line is Mill St. Just before reaching the present terminus of the line at Lorne bridge, there is a freight shed, built on the style of the C.P.R. freight shed in Galt, and also a brick car barn, in which are also located the transformers.

Edmonton Municipal Railway Matters.

The Edmonton, Alta., Property Owners' Association, has adopted a resolution recommending the City Council to appoint a board of directors to administer the whole of the public utilities owned by the city. The report recommends that five directors be appointed by the city council from a list of 15 names to be nominated by the council of the board of trade and that these directors assume office Jan. 1, 1917. Of the first directors two it is proposed shall have office for three years and three for five years, directors subsequently elected to hold office for five years. Directors to be subject to removal without cause or a vote of ratepayers, and to receive \$10 for

current financial year. After all charges are met the estimates for the street railway provide for an anticipated deficit at the end of the year of \$95,829.77. A summary of the expenditures and revenue during the year is as follows: Revenue \$546,656; expenditure, operation, maintenance and power charges, \$356,778; capital charge, \$228,846.72; depreciation, \$25,557.05; bank interest and overdraft, \$31,200. The salaries of the permanent staff last year were \$38,857.30, and the sum asked for this year by the Superintendent was \$27,402, but the commissioners reduced the estimate to \$26,931.50. Motormen's and conductors' salaries amount to \$164,198.70, against \$156,163.84 last year. Power charges last year were \$97,516.05, and the estimate of \$97,600, as submitted was passed by the commissioners. The estimated cost of maintaining rolling stock was reduced from \$26,423.67 actually expended last year to \$20,000.

Hamilton St. Ry.—E. P. Coleman, General Manager, Dominion Power and Transmission Co., is reported to have informed the Hamilton City Council railway committee Feb. 15, that the relaying of the tracks on Herkimer St., between Queen and Locke Sts., will be strated in the spring, but the company cannot see its way clear to lay new tracks on King and York streets.

Toronto Railway Co's Annual Report.

Following are extracts from the directors report for the calendar year 1915:—

When one considers the effect of the abnormal traffic conditions upon the earnings of the company due to the continuance of the war, we think the company is to be congratulated upon the result of its operation throughout the year.

Gross earnings	\$5,694,136.43
Operating, maintenance, etc....	3,250,611.95
Net earnings	\$2,443,524.48
Dividends	\$857,952.00
Bond interest	167,356.67
	\$1,125,308.67
Payments to city	
Percentage on earnings	\$868,251.46
Pavement charges	96,576.89
General taxes	99,240.87
	1,064,072.22
	\$2,189,380.89

Passenger earnings were \$5,611,296.60, a decrease of \$432,215.55 from 1914. The various charges against the earnings for operation, maintenance, etc., were \$3,250,611.95. Payments made to the city during the year were \$1,064,072.22.

The fifth drawing of currency and sterling bonds, under the terms of the mortgage deed, took place June 21. The company draws annually during the last 10 years of its franchise, 5% of the amount of bonds issued, thus reducing the outstanding bonds within the said period to 50% of the original issue, and all bonds so drawn are to be redeemed on or after Aug. 3, following the date of drawing, and from which date no interest is payable on bonds so drawn. There has been drawn to date a total of \$1,137,653.32.

Careful attention has been paid to the maintenance of the plant, rolling stock equipment and other properties. Your directors declared out of the accumulated surplus earnings, 4 quarterly dividends of 2%, which were paid on the dates set for payment.

PROFIT AND LOSS ACCOUNT.

Balance from 1914	\$4,792,369.83
Surplus earnings, after payment of all expenses, interest, taxes, etc....	1,192,489.64
	\$5,984,859.37
Dividends, 4 of 2 per cent. each....	\$ 957,952.00
Balance from 1914	\$4,792,369.83
Surplus carried forward 234,537.54	
	5,026,907.37

	1915.	1914.
Gross income	\$5,694,136.43	\$6,127,096.77
Operating, maintenance charges, etc....	3,250,611.95	2,597,550.55
Net earnings	2,443,524.48	3,529,546.22
Passengers carried	142,061,258	152,966,153
Tonnes	62,398,638	65,778,022
Percentage of charges, etc., to passenger earnings	57.9	58.4

The board of directors was re-elected for the current year, as follows:—Sir William Mackenzie, President; Frederic Nicholls, Vice President; Sir Henry M. Pellatt, Sir Rodolphe Forget, E. R. Wood, W. D. Matthews, James Gunn.

The Shawinigan Water and Power Co's Electric Railways.

The annual meeting was held Feb. 15. The company owns the Shawinigan Terminal Ry., an electric line operating between the various industrial concerns at Shawinigan Falls, Que., and the several steam railways, and has a controlling interest in the Three Rivers Traction Co. Following is an extract from the report:—"Early in the year the Three Rivers Traction Co. control of which is

vested in your company, was formed to install and operate a street railway system in the city of Three Rivers, and obtained favorable franchises from the city. The geographical location of Three Rivers, together with the great power resources of the district of which it is the centre, makes it one of the most promising industrial communities in Canada. Your company already owns the North Shore Power Co., which supplies light and power to the city, and the acquisition of the tramway privileges rounds out the problem of supplying that community with light, power and transportation."

The directors for the current year:—are J. E. Aldred, President; Thos. McDougall, Chairman of the Board; H. Murray, J. C. Smith, Vice Presidents; Sir Herbert Holt, Montreal; Sir William Mackenzie, E. R. Wood, Toronto; D. Murphy, Ottawa; R. M. Aitken, London, Eng.; Sir M. Mitchell-Thomson, Edinburgh, Scotland.

London Street Railway Co.'s Annual Report.

Following are extracts from the report for the calendar year 1915.

	1915	1914
Passenger earnings	\$393,299.00	\$370,915.62
Miscellaneous earnings	5,559.00	4,979.66
Gross earnings	\$398,858.00	\$375,895.28
Maintenance		
Way and structures	\$ 35,619.11	\$ 31,732.73
Equipment	29,046.60	34,669.66
Power	38,365.25	42,291.79
Car service	131,308.94	123,796.29
General expenses	40,771.81	35,410.36

Total operating expenses	\$275,212.04	\$267,900.83
Net earnings	\$123,645.96	\$107,994.45
Interest on bonds	\$ 32,769.63	\$ 31,908.59
Interest on overdraft	23.50	40.35

Total deductions	\$ 32,793.13	\$ 31,948.94
Net Income	\$ 90,852.83	\$ 76,045.51

During the year \$42,189.29 was expended in construction and equipment.

No extensions of tracks were made. A considerable amount of new paving and reconstruction of tracks was done, all of which was required on account of the city laying new pavements where none had existed before. The four new cars obtained late in 1914 were put into service early in the year. Three of the older cars were rebuilt to conform with the p-a-y-e type like the new cars, as this type has been found to be of great benefit, especially with regard to preventing accidents. Rearrangement of motors under the double truck cars, by using 2 or more modern type instead of 4 under each car, has resulted in considerable saving in repairs and in power consumption. Hydro electric power has continued to give good satisfaction during the year; delays on account of the power being off being negligible. Under the terms of our contract for power, a further slight reduction in the rate is anticipated for the year 1916. The bylaw passed by the city for one years' trial of Sunday car service, was extended without change of detail for 2 months and then for another period of one year, which will end with the operation on Sunday, April 20, 1916, unless extended as heretofore. Some public agitation arose during the summer for Sunday car service to Springbank Park, but when it was found nothing could be done without legislative action, the matter was laid over. It remains to be seen whether or not it will be taken up again. General financial conditions having become settled, after the excitement consequent upon the outbreak of the war, the British slogan "Business as usual" seemed to prevail generally and so the com-

pany's business enjoyed its usual normal growth, and at present the prospects look good for the next year.

	1915	1914
Expenses, per cent. of earnings	69.0	71.2
Passengers carried	10,801,531	10,286,448
Car earnings, per revenue passenger	3.68c	3.64c
Transfers	1,765,067	1,697,963
Total passengers	12,566,598	11,984,411
Car earnings, per passenger	3.13c	3.09c
Car mileage	1,946,439	1,908,175
Gross earnings, per car mile	20.48c	19.69c
Operating expenses, per car mile	14.13c	14.03c
Net earnings, per car mile	6.35c	5.66c
Miles of track	35.19	35.19
Gross earnings per mile of track	\$11,234.41	\$10,681.88

At the annual meeting, Feb. 2, the President, E. W. Moore, of Cleveland, Ohio, occupied the chair. The directors were re-elected, the board being as follows:—E. W. Moore, President; T. H. Smallman, London, Vice President; C. B. King, London, Manager; P. W. D. Broderick, Toronto; St. Herbert Holt, Montreal; W. M. Spencer, C. H. Ivey, London. The Secretary-Treasurer, G. C. Holding, tendered his resignation, which the directors declined to accept, and he continues.

Berlin and Waterloo Street Railway Report.

The Berlin, Ont., Light Commissioners, who operate the B. & W. S. R. for the city, under the management of V. S. McIntyre, Superintendent, have issued their statement for the calendar year 1915, from which the following is taken:—

RECEIPTS.

Cash fares	\$17,931.70
Tickets sold	24,593.60
Parcels	253.81
Advertising	512.00
B. & N. St. Ry. Co.	1,786.92
Mail contracts	1,750.00

\$18,628.03

EXPENDITURES.

Operating Expenses—	
Power	\$ 6,629.73
Supplies	2,095.61
Wages	11,817.51
Snow cleaning	871.91
Salaries	1,272.01
Tools	56.21
Coal account	41.45
Crossing expenses	541.97
Heating car barn	307.66
Maintenance and Repairs	
Building repairs	31.15
Car and motor repairs	1,039.16
Car painting	14.80
Storage battery repairs	8.20
Track and line repairs	1,315.63
	5,409.24

General Expense	
Printing, telephones, advertising, etc.	\$1,549.10
Insurance	1,073.11
Interest	126.83
Legal fees	65.50
Office furniture	13.14
Office expense	245.99
Rent account	672.51

Accounts receivable written off	1,460.88
Debenture interest	581.00

Gross profit	\$11,901.43
Depreciation	\$ 6,726.60

Net profit	\$ 5,174.83
------------------	-------------

It is pointed out that while the receipts showed a decrease of 5.6% from 1914, there was a saving of 9.1% in operating expense. After paying debenture interest \$7,851.60 and writing off depreciation, \$5,497.72 the net profit shown of \$1,228.88 is approximately \$800 more than that shown for 1914.

W. C. Webb has been appointed chief clerk to Superintendent, Canadian Ex. Co., Winnipeg, vice Z. M. Middleton, transferred.

Safety First on Ottawa Electric Railway.

In prosecuting its safety first campaign, the Ottawa Electric Ry. is paying special attention to the education of the public, and for this purpose has issued a large monthly sheet calendar, each sheet having four short sentences, arranged round the calendar, covering information as to the company's work for the reduction of accidents, or some apposite maxim for the benefit of the public as well as employees. Following are examples of the matter, some of which are constantly before one in using the calendar, carrying a reminder which will undoubtedly have a beneficial effect:—

Accidents cause widows, orphans, cripples, poverty, suffering.

Ninety per cent. of all accidents are the direct result of carelessness and could be prevented.

Accidents belong to the old age of waste and inefficiency.

Will you co-operate with us to make an accident, even the smallest, a rare occurrence in Ottawa?

Accidents occur daily in every walk of life, in the factory, the shop, the home, on the street everywhere.

When caution becomes a habit there will be few accidents.

We are working unceasingly to educate our employes to prevent accidents. How about yours?

To save any part of the huge annual loss through accidents is good business, and pays dividends to everyone. It can be done, but not without your co-operation.

Chauffeurs and drivers. Changes in temperature cause a greasy rail. When brakes are applied the wheels stop, but the car slides forwards.

The average street car weighs 30 tons. It cannot be stopped in a few feet.

Slow down approaching car track streets, and look both ways before crossing.

Our men are carefully instructed to do everything possible to prevent accidents, but sometimes they are helpless, unless you co-operate.

When you have occasion to cross behind a car, remember there may be another car or vehicle coming from the opposite direction which you cannot see.

You have no right to take chances. Your family may have to stand the consequences.

Carelessness has destroyed more human lives and property than all the wars of the world.

Don't try to jump on a moving car. Take the next one. Better to miss an appointment than break a leg.

Parents. The causes of most accidents to children are carelessness and fear. Instruct them how to avoid the perils of the streets.

Do mothers realize a parting word of caution may be the most effective means of preventing an accident?

Teach your children the safest route between home and school, and point out the dangerous places.

Don't let the youngsters play on the car tracks and busy streets. If they must play on the street, the sidewalk is the only safe place.

To take a car, with the right hand clasp the bar, and hold with the firmest grasp, Then step up with the left foot first, And you are braced to meet the worst; For, if the car should move at all, Your right foot saves you from a fall But when you wish to leave the car, Be sure the left hand grips the bar, Set first the right foot on the ground,

Then facing front you will be found, And though the car may start or stay, You can with safety wend your way.

Don't ask the conductor or motorman to open the exit door before the car stops. He is forbidden to do so.

Wait till the car stops. A moment then may save a month in the hospital.

If a car is crowded it is usually behind time, and you will find another of the same line within a block or two.

When a motorman rings his gong, he is appealing to you to help him prevent an accident.

Don't try to board or leave a moving car. Your life may pay for undue haste.

Get rid of the careless habit. Acquire the safety habit. It is better to be careful than crippled.

Chauffeurs and drivers. Obey the traffic rules of the city. Keep to the right, and when turning to the left, go around the centre of the crossing.

The law commands you not to pass a standing car. If you are in a hurry take a side street.

Don't be offended at the motorman's gong. He is thinking of your safety.

The car must stick to the rails. You have the rest of the street. Keep off the tracks whenever you can, and give the motorman a chance.

Always look both ways before crossing car tracks. You may not hear the gong in the noise and bustle of a busy street.

When on your feet in a moving car, take hold of the grab rail, strap or seat back. The motion of the car may throw you out.

Don't expect that every car will stop when it approaches a crossing. It may be going through.

If a car does not stop on your signal, don't try to board it. Look and see if there is another following close behind. If not, take the number of the car that has passed you, and report it.

When an accident happens, give your name to the conductor. If we are at fault we want to know it, in the interest of public safety. If we are not at fault you will be protecting the conductor or the motorman from unjust censure.

The most reliable information of an accident always comes from the unbiased statements of disinterested witnesses.

We are not trying to avoid the payment of just claims, but to eliminate accidents by carefully investigating those that do happen.

If ladies would carry hand bags, parcels, etc., in the right hand they would instinctively use the left hand on the grab handle, and would leave the car the safe way, facing the front.

There is no compromise with accidents. The only cure is prevention through carefulness.

Don't depend upon a car to stop. Wait until it has stopped.

Remember when leaving a car, face the front, and use the left hand for the grab handle.

Cars do not stop at every crossing. If they did, rapid transit would be impossible. Drivers and chauffeurs can help to prevent many collisions by carefulness at intersections.

We all have the same rights on the streets, but the motorman has the hardest job. He can't turn out to avoid an accident.

Habits are the hardest things in life to change. Teach the children the value of carefulness so they will instinctively act for safety.

British Columbia Electric Railway Matters.

The Board of Railway Commissioners has approved the schedule showing train service put in effect on Vancouver, Fraser Valley and Southern Ry., which is a subsidiary of the B.C.E.R.

B.C.E.R. officers complain of the theft of large quantities of copper wire from occasionally used and unused spur lines, particularly on the Fraser Valley lines.

When the B.C.E.R. notified the public that "tango" tickets would not be used after Feb. 1, there were about 20,000 outstanding. It was reported Feb. 1, that only about \$20 worth were redeemed in cash, the balance either having been used or exchanged for the new green tickets.

The B.C.E.R., in addition to the service put in effect on its Vancouver lines on Jan. 15, put extra cars on its Georgia East, Main St. South, Nanaimo St. and Sasamat and Dunbar St. lines on Jan. 19. On Jan. 30 a new Sunday schedule was first in operation in Vancouver, provision being made for the running of special cars as required.

As a result of the visit of a Board of Railway Commissioners' inspector to New Westminster, the B.C.E.R. gave notice Jan. 24, that a new and improved car service would be put in operation at once on the Burnaby Lake line. The new schedule provides for an hourly service during half the day, and a two hourly service for the remainder, with an extra car on Saturday nights, between New Westminster and Vancouver, and a special church service on Sunday.

The Jitney Situation in Canada.

The City Solicitor of Montreal has advised the Montreal City Council that it is not yet in a position to compel the Canadian Autobus Co. to put into effect the service on the streets called for in the contract with the city. The one action to upset the franchise has been settled by the Imperial Privy Council, but the other action which has remained in suspense must be disposed of before the city can make any move in the direction of compelling the company to give any service.

There were 86 licenses to operate jitneys issued in Edmonton, Alta., during 1915, but it is estimated that not more than 50 cars were in operation at one time. With the introduction of the license fee a number went out of business. Only 4 licenses are reported to have been taken out for 1916, but the city's license inspector states that this number will be added to, and that during the summer there will be as many jitneys in operation as last year.

The jitney men are taking an active part in municipal politics in Vancouver, B.C., according to a statement reported to have been made by R. G. Gordon, Secretary of the recently formed jitney association.

It was reported at the Vancouver city hall, Feb. 14, that on Dec. 31 there were 190 jitneys for which bonds were in existence. Since that date 60 of the bonds have been cancelled.

Toronto Civic Ry. Ticket Advertising Privileges—The Toronto Works Department received tenders Feb. 29, for the privilege of advertising on a portion of the back of tickets issued on the Toronto Civic Ry. The contract will cover the issue of 25,000,000 tickets, which, it is estimated will last for two years.

Electric Railway Projects, Construction, Betterments Etc.

Brantford Municipal Ry.—The Brantford City Council is asking the Dominion Parliament to authorize it to extend the Grand Valley Ry. from its present terminus in the township of Brantford to Cainsville, in the same township; to confirm the bylaw constituting the Brantford Railway Commission, and to provide that the commission's powers may at any time be vested in any commission which may hereafter be created by the council for the management and control of two or more of its public utilities.

We are officially advised that the proposed application for power to build a line to Cainsville was inserted in the bill with the idea that it might prove useful at some future time. The commission has no definite views as to where such a line would start, or its route, or whether it will be necessary to build it at all. (Sept. 1915, pg. 359).

The Dominion Power & Transmission Co. will resume work early in March on the construction of its east end power station in Hamilton, Ont.

Edmonton Power Co.—The Alliance Trust Co., Calgary, Alta., has made a tentative offer of electric power to the Edmonton City Council, on terms which, it is claimed, are lower than those set out in the franchise which it is proposed to grant to the Edmonton Power Co., a summary of which company's project was given in our February issue, page 72. The plans of the company in which the Alliance Trust Co. is interested have not been made public, but it was stated in Edmonton, Feb. 3, that it was proposed to generate power at the Viking gas fields by the use of gas engines. The cost of the plan and transmission lines is estimated at \$2,000,000.

The Edmonton City Council's power committee met on Feb. 7, when R. B. Bennett, M.P., President of the Alliance Trust Co., alleged that the bylaw was illegal, and if it was repealed his company was prepared to enter into competition with the E. P. Co., for a legal agreement. A letter was read from the E. P. Co., protesting against further delay, and threatening an action for damages if the Council does not go on with the project now that it has approved of the bylaw. At a meeting of the Edmonton City Council Feb. 8, Alderman Wilson gave notice that he would move for the repeal of the bylaw passed recently agreeing to give a franchise to the Edmonton Power Co.

The London Street Ry. expects to rebuild some track this year and do some paving as may be determined by the city. An order has been given for the season's supply of paving brick.

Morrisburg & Ottawa Electric Ry.—An Ottawa paper says that the annual meeting was held there Feb. 8 and gives the following report of it: "There was a fairly large attendance of shareholders, about \$100,000 of stock being represented. The report said that it is hoped to start construction by May. Most of the right of way is held outright by the company and the remainder is held under option. The engineering work on the main line and the branch lines has been completed and reports were also presented setting out the estimated earnings. It was stated that while the company has three years yet under its charter to complete the road, it would be better to go

to the Ontario Railway and Municipal Board to get an extension to five years in order to improve the company's financial status when it comes to sell bonds. A motion was passed authorizing the directors to call a special meeting of shareholders to deal with delinquent subscribers who are not considered financially strong and it might perhaps be advisable to cancel their shares." The directors for the current year are J. G. Hilt, President and Managing Director; R. J. Biggar, W. C. Strader, and J. B. Boggart. R. A. Bishop is Secretary-Treasurer.

Mount McKay & Kakabeka Falls Ry.—The Ontario Legislature is being asked to extend the time for the completion of the company's railway in the vicinity of Fort William, Ont., and to authorize it to use any kind of motive power, including steam. The line is about five miles long, and connects with the Fort William Electric Ry.; it was opened for traffic in 1909, but has not been operated lately except for freight purposes, and is equipped for operation by electricity.

Ontario Hydro Electric Railways.—A press report says that the Hydro Electric Power Commission of Ontario has had a survey made for an electric railway from Toronto to Niagara Falls, that the projected Toronto-London line will be used from Toronto to Port Credit and that the Niagara line will diverge at the latter point passing through Oakville, Burlington and Hamilton. The report says that bylaws to provide the money will be submitted to the municipalities interested in a few weeks.

Sudbury-Copper Cliff Suburban Electric Ry.—The Ontario Legislature is being asked to confirm an agreement dated Sept. 15, 1915, authorizing the guarantee by the town of Sudbury of the company's bonds for \$75,000, upon the security of a mortgage of the company's real and personal property and franchises.

Three Rivers Traction Co.—The property owners of Cap a la Madeleine, Que., on Jan. 29, by a majority of 49, decided to grant a franchise to the T. R. T. Co., for the operation of an electric railway in the municipality. The franchise is to run for 20 years. The municipality has hitherto refused to grant such a franchise and the company took steps to obtain legislative authority to build the line notwithstanding the refusal to grant the franchise. (Feb., pg. 73.)

Toronto, Barrie and Orillia Ry.—The Ontario Government was asked by the company Feb. 17, to issue the necessary proclamation to bring in force the act passed in 1915, granting an extension of time for the building of the projected railway. Under the original charter, viz., that of the Monarch Ry., and the amendments thereto, up to and including the act of 1914, the company has power to build a railway from Toronto to Barrie, with a branch to the C.P.R. near Utopia; a local line in Barrie, and a line from Barrie to Orillia, with branch lines. A franchise within the town of Barrie was obtained from the town council, and surveys were made for the line from Barrie to the C.P.R. in 1913, but nothing in the way of construction has been done. A route was also partly located by the Monarch Ry. for some distance out from Toronto, and some negotiations with the municipalities interested were carried on. The company claims that \$55,000 has

been expended upon surveys, etc. Under the act of 1915, the company's plans for the railway were to be approved as to gauge, etc., by the Hydro Electric Power Commission of Ontario, which was given authority to acquire the undertaking. This was the only one of the large electric railway undertakings which survived the opposition of the H. E. P. Commission in the Legislature last year. The total mileage of the lines projected is: Toronto to Barrie, 60 miles; Barrie to Utopia 8 miles; Barrie to Orillia 30 miles, total 90 miles. The company says it is asking for the bringing into force of the act in order to take up the building of the line from Barrie to Utopia, and is also asking the Barrie town council for a removal of the local franchise. A. Bicknell, Toronto, is solicitor for the company. (Dec. 1915, pg. 483).

The Windsor, Essex & Lake Shore Rapid Ry. expects to do some paving in Leamington, Ont., during this year.

Kingston, Portsmouth and Catarqui Electric Railway Wages.

This company has advanced its conductors' and motormen's wages, the following table showing the old and new rates per day.

	Old.	New.
1st 3 months	\$1.50	\$1.75
2nd 3 months	1.55	1.85
2nd 6 months	1.60	1.90

Under the old schedule, after the 2nd 6 months, the pay was advanced 5c a day every 6 months till \$2 was reached. Under the new schedule the pay is to be advanced 5c a day after every year.

Nova Scotia Tramways & Power Co.—The Nova Scotia Public Utilities Commission, on Feb. 9, filed its decision on the application of the Nova Scotia Tramways & Power Co. for leave to issue \$6,250,000 of capital stock, \$3,250,000 of preferred stock and \$3,000,000 bonds. The Board finds that the company should be permitted to raise \$5,550,000 by the issue of \$3,000,000 of 5% thirty year bonds at 90; \$2,500,000 in preferred stock at 75, and \$2,500,000 in common stock at 40.

Toronto Suburban Ry. Toronto Franchise.—The Mayor and the City Solicitor of Toronto waited on the Attorney General of Ontario, Feb. 4, to discuss the proposal to cancel the Toronto Suburban Ry. franchise granted by West Toronto, now a part of the city. They explained the position of the city and the company, and asked that the city be granted power to give a service in West Toronto. The Attorney General asked that a memorandum be submitted for his consideration.

Lighting of Lake Erie & Northern Ry. Cars.—The article describing the L. E. & N. R. passenger cars in Canadian Railway and Marine World for February contained the following sentence in referring to the lighting fixtures. "Supplementing the above, a number of Crouse-Hinds type J.R.R.H. hoods, with Crouse-Hinds pendants No. 8294." The Safety Car Heating & Lighting Co. advises us that this sentence should have read as follows: "Supplementing the above a number of Crouse-Hinds type JRRH hoods with Safety Car Heating & Lighting Co. pendants No. 8294."

G.T.R. officials and employees are being asked to give one day's pay to the Canadian Patriotic Fund in Feb., May, Aug. and Nov. this year.

Canadian and United States Railways are said to have spent over \$10,000,000 in newspaper advertising in 1915.

Accident Case Decided in Ottawa Electric Ry. Co.'s Favor.

The Supreme Court of Canada gave judgment Feb. 10., in the case of Mrs. J. P. Hayes, vs. the Ottawa Electric Ry. Co. On Aug. 18, 1913, J. P. Hayes came into collision with an Ottawa Electric Ry. car on Somerset St., near the corner of Bronson Ave., sustaining injuries from which he died the following morning. His widow and children brought an action against the company, claiming \$5,000 damages, and in the action, which was tried before Sir William Mulock, with a jury, on Jan. 11 and 12, 1915, recovered a verdict against the company for \$3,500.

The judgment at the trial was appealed by the company to the Appellate Division of the Supreme Court of Ontario, which gave judgment on May 11, 1915, affirming the trial judgment. The company then appealed to the Supreme Court of Canada, which on Feb. 10 gave a unanimous judgment in favor of the company, allowing the appeal and dismissing the action with costs.

The case is one of considerable public interest, involving the liability of a street railway company for an accident such as this, where the evidence disclosed that Hayes did not take proper precautions in crossing the street. The jury found that the company's motorman was negligent, and that Hayes' contributory negligence did not continue up to the moment of the accident. The Supreme Court holds that in this particular case there was no evidence to support the finding of the jury of the company's negligence. It appears from the reasons which are thus far available that the facts are that the motorman first saw Hayes as he stepped off the curb; that, because he then apprehended that an accident might happen, he immediately rang the gong to warn Hayes; that at 30 ft.—or about one second later—he realized that Hayes was not going to stop, and became seriously apprehensive, and at once applied the brakes as vigorously as he could, still "gonging," and also shouting at Hayes, who continued to walk on with his head down, apparently oblivious of danger.

The Supreme Court holds that the motorman did all in his power, and exercised his best judgment from the moment he was 30 or 35 ft. from the point of contact. The court further states that there is nothing in the facts of the case to warrant a finding of fault or negligence on the motorman's part and that, if he made any mistake at all, it was at most an error of judgment in a sudden emergency, but even that was not established. The judges are careful to point out that no doubt a motorman driving a street car must always be alert; but having regard to the practical necessities of street car operation, the court is not prepared to hold that it was open to the jury to find under the circumstances of this case, that in failing to apply his brakes instantaneously upon Hayes stepping off the curb, and before the motorman had seen or had any reason to think that the sharp clanging of the gong would be ineffective, the motorman was guilty of any negligence.

The Ontario Railway and Municipal Board sat in Windsor, Feb. 21, to hear complaints against the Sandwich, Windsor & Amherstburg Ry's car equipments, etc. The question of air brakes and lavatories on the interurban cars were discussed and the whole matter was held over for consideration.

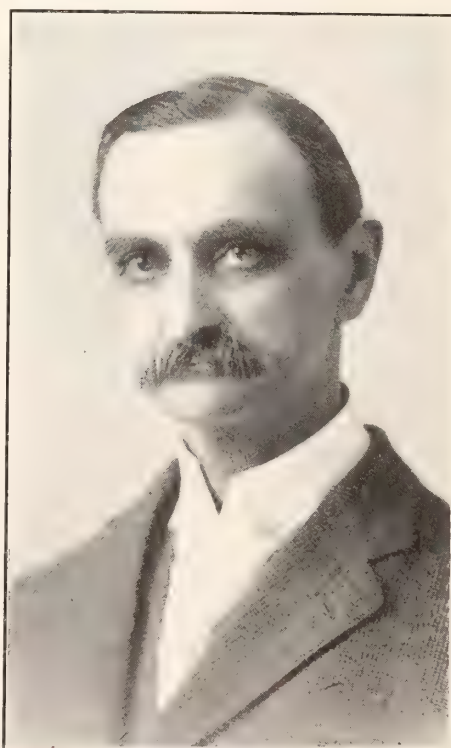
Mainly About Electric Railway People.

R. Barber has been appointed Treasurer, International Transit Co., Sault Ste. Marie, Ont., vice J. Hawson.

F. T. Leversuch, Traffic Manager, London and Port Stanley, having resigned,



F. D. Burpee,
Superintendent, Ottawa Electric Railway.



P. A. Macdonald,
Public Utilities Commissioner for Manitoba.

J. E. Richards, heretofore Auditor and Treasurer, has been appointed Treasurer and Traffic Manager, Office, London, Ont.

W. H. Munro, Local Manager, Peterborough Radial Ry., Peterborough, Ont., who went overseas last summer with the Canadian Army Service Corps, mechanical transport branch, as a lieutenant, has been promoted to a captaincy.

W. F. Graves, Chief Engineer, Montreal Tramways Co., who was operated on in a New York hospital Jan. 5, left for Atlantic City Jan. 29 to convalesce.

A. E. Ames, Toronto, has been elected Chairman of the Board of Directors of the Duluth-Superior Traction Co., Duluth, Minn., a new office created by bylaw following the death of C. G. Goodrich, who had been President.

E. A. Evans, M.Can.Soc.C.E., formerly General Manager, Quebec Ry. Light and Power Co., Quebec, has been re-elected Grand Master of the Grand Lodge of Quebec, A.F. and A.M., for the current year.

Col. H. H. McLean, K.C., M.P., President, St. John Ry. Co., has been appointed in charge of the military district of New Brunswick, which has now been separated from Nova Scotia for military administration purposes. His son, Hugh McLean, has been admitted to the English bar recently and has been given a commission in the British Cavalry Reserve.

Geo. W. Lang, who has been appointed Claim Agent, Ottawa Electric Ry., Ottawa, Ont., was born there June 13, 1872 and entered that company's service in June 1892, since when he has been, to July 1896, conductor; July 1896 to Oct. 1908, Inspector; 1908 to 1909, Assistant Superintendent. He left the company's service in 1909, and until his present appointment, was engaged in private business in Calgary, Alta.

Wilford Phillips, Manager, Winnipeg Electric Ry., has been granted six months leave of absence, owing to ill health, and is now at Los Angeles, California. During his absence Harry Hartwell is acting Manager. The latter is a member of the American Society of Civil Engineers and the American Society of Mechanical Engineers and the for the past four years has been Assistant to Vice President, Pearson Engineering Corporation, New York, N.Y.

Capt. F. D. Burpee, Superintendent, Ottawa Electric Railway, will, it is said, be appointed Major of the 207th Battalion which is being organized for overseas service. During his absence, G. W. Lang, who was appointed recently as the company's Claims Agent, will act as Superintendent. Mr. Lang was in the company's service for a number of years and was Assistant Superintendent under J. E. Hutcheson. He removed to Calgary, Alta., where he was in the real estate business. A few days after volunteering for active military service he lost a leg in an automobile accident.

The Toronto Railway's advertising privileges on its cars have been leased to the Toronto Car Advertising Co. Inc., which was incorporated in New York State in 1915, the President being Henry Weinburg, 527 Fifth Avenue, New York, who is also President of the Car Advertising Co. and of the Keystone News Co. The Toronto Car Advertising Co. has been licensed to do business in Ontario and has an office at 304 C.P.R. Building, Toronto, M. Bloch being Manager. The Car Advertising Co., New York, handles the advertising in the Philadelphia Rapid Transit Co's cars at Philadelphia, Pa.

The London and Port Stanley Ry., which is operated by the London Railway Commission, London, Ont. is in the market for trailers cars and 90 tons of 80 lb. rails.

Opposition to Extension of Railway Charters in the Niagara Peninsula.

Among the bills before the Dominion Parliament's Railway Committee are two, viz., the Niagara, St. Catharines & Toronto Ry., and the Toronto, Niagara & Western Ry., in regard to which considerable opposition has developed on the part of the City of Toronto, and the Hydro Electric Power Commission of Ontario. The first named company obtained power in 1899 to build an extension of the old St. Catharines & Niagara Central Ry. to the Niagara River near Fort Erie, and an extension to Toronto, via Hamilton, and in 1913, was granted an extension of time for building this and certain branch lines in the Niagara Peninsula. The second company was originally incorporated as the Toronto & Hamilton Ry., to build an electric railway from Toronto to Hamilton, the projected route being along the right of way of the Niagara Power Co's line. The title of this company was subsequently changed to the Toronto, Niagara & Western Ry., and in 1903 it was enacted among other things that nothing in the act should give it power to construct its line along Burlington Beach, without the consent of Nelson Tp. respecting the part in the County of Halton, and the Burlington Beach Commission respecting the part in the County of Wentworth. In 1904 it was given power to extend its line from Hamilton to Niagara Falls, and in 1906 it was given power to extend its line from Hamilton to Windsor. These several acts were continued by amending acts, the last being in 1914, the prohibition as to building along Burlington Beach being continued, and three sections being added respecting the company's rights in the City of Toronto. Sec. 5 of the act of 1914 prohibits the receiving or discharging of passengers between the terminals in the city and the west boundary of the city, unless under the terms of a bylaw duly passed; sec. 6 prohibits the picking up or discharging of local passengers between the terminals and the western boundary of the city, but does not prevent the discharging of passengers from outside points at any place within the city limits; and sec. 7 deals with the rights of the City of Toronto as to construction within the city. Both these lines are being promoted by the same interests, the Canadian Northern Ry. Co.

The first bill came up a second time before the Railway Committee Feb. 22, when it was arranged to take it up again Mar. 2, in conjunction with that of the Toronto, Niagara & Western Ry. It is said that in addition to the City of Toronto, and the Hydro Electric Power Commission of Ontario, various municipalities interested in the Ontario Hydro Electric Railway Association of Ontario will appear in opposition to the bills.

Electric Railway Notes.

The London Street Ry. expects to rebuild some old cars in the near future.

The Sudbury-Copper Cliff Suburban Electric Ry. has bought two double truck cars from the Third Ave. Ry., New York.

The Sherbrooke Railway Light and Power Co. is in the market for two new men, near side cars.

The Hamilton St. Ry has put in operation at the request of the city council a cross town service on Sanford and Birch Avenues, from King St. to the base line, to relieve the congestion of traffic in the factory district.

The Edmonton Power Co. is applying

to the Alberta Legislature for the confirmation of a bylaw passed by the City of Edmonton, authorizing the execution of an agreement for a franchise to supply electric power in the city.

Commissioner Freeman is working out a new schedule for the Lethbridge, Alta., Municipal Ry., under which it is calculated that cars will travel a much less distance to give the same of service, and that they will be much more evenly distributed over the line.

The British Columbia Electric Ry., in return for aid given by soldiers in training in Victoria in keeping the tracks clear during the recent snow storms, is reported to have granted permission for all soldiers to travel free on the Victoria lines for a month.

The question of the cost of taking up and relaying the street railway tracks under the 13th St. subway, which has been in dispute between the Lethbridge, Alta., City Council, and the C.P.R., is being taken by the C.P.R., to the Board of Railway Commissioners for settlement. The amount involved is \$405.

The City Council of Windsor, and the councils of the towns of Walkerville, Sandwich, Ford City and Ojibway, are applying to the Ontario Legislature to constitute, with the assent of the electors of the several places, a joint public utilities

commission, to have all the powers under the Public Utilities Act in each of the municipalities. The reason given for the application is that the five municipalities are adjoining and front upon the Detroit River, and it would be more economical and more practical that the utilities and powers in which each of the municipalities have a common interest should be exercised by a joint commission having authority in each of the municipalities rather than by the existing separate authorities.

Judgment was delivered in the Quebec Superior Court, Montreal, Feb. 7, by Justice MacLennan, in the action brought against Mayor Martin, Controller Cote and ex-Controller Hebert, for contempt of court in passing a resolution granting a franchise to the Montreal Tramways Co., June 20, 1914, in face of an injunction restraining them from doing so. The judge held that there had been "a deliberate, wilful and discreditable breach of the injunction" on the part of Mayor Martin and ex-Controller Hebert, and fined them each \$1,000 and costs. The case against Controller Cote, who voted for the franchise, was held over for further consideration. Controller McDonald protested against the passing of the resolution. An appeal will, it is said, be made against the decision.

Electric Railway Finance, Meetings, Etc.

Brantford Municipal Ry.—The bylaw selling the Paris-Galt section of the Grand Valley Ry., to the Lake Erie and Northern Ry., on terms and conditions mentioned in Canadian Railway and Marine World for February, page 76, was finally approved by the Brantford, Ont., City Council, Jan. 28, by 10 votes to 3.

British Columbia Electric Ry., and allied companies:—

	Dec. 1915	Dec. 1914	July 1 to Dec. 31, 1915	July 1 to Dec. 31, 1914
Gross	\$600,667	\$671,063	\$3,210,146	\$3,998,899
Expenses	478,129	512,663	2,885,302	3,074,568
Net earnings	122,538	161,400	354,844	924,331

Cape Breton Electric Co.:—

	Dec. 1915	Dec. 1914	July 1 to Dec. 31, 1915	July 1 to Dec. 31, 1914
Gross	\$36,267.87	\$29,794.13	\$201,616.55	\$182,571.87
Expenses	19,625.69	18,777.62	108,316.46	110,115.80
Net	16,642.18	11,016.51	93,300.09	72,456.07

Dominion Power & Transmission Co.—

The statement presented at the annual meeting in Hamilton, Ont., Feb. 21, showed gross earnings for the year of \$2,353,956, and operating expenses \$1,352,001. After providing for bond interest, maintenance, renewal, and dividends and transferring \$500,000 from the profit and loss account of \$1,139,259 to the reserve fund, the net profits were \$639,259. The directors were re-elected. It was announced that 83 employees have enlisted.

Hamilton St. Ry.—Gross earnings for three months ended Dec. 31, 1915, \$158,730.28, against \$135,287.58 for same period 1914. Percentage paid to city, \$12,698.42 for quarter ended Dec. 31, 1915, against \$10,823.01 for same period 1914. Total percentage paid to the city in 1915, \$53,095.37, against \$54,712.08 in 1914.

Lethbridge Municipal Ry.—Returns for 1915 as submitted to the Lethbridge, Alta., City Commissioners, show that there was a surplus of \$3,677.64 over operating expenses for the year. The total gross earnings reported were \$41,740.51; operating expenses, \$38,062.87. The actual deficit on the railway to Dec. 31, is \$34,708.96. The commissioners have estimated the revenue for the cur-

rent year at \$45,070, and the expenditure at \$39,550.40. The amount estimated to be raised from the general taxes against the estimated deficit is given as \$31,590.40.

London St. Ry.:—

	Jan. 1916	Jan. 1915
Gross	\$32,462.68	\$30,616.10
Expenses	21,641.53	21,518.62
Net	10,821.15	9,097.48

Moncton Tramways, Electricity & Gas Co.—The annual meeting called to be held in Moncton, N.B., Feb. 9, was adjourned to Mar. 9, there not being a quorum present.

The Eastern Trust Co., as trustee under the company's trust mortgage deed of Jan. 16, 1912, received tenders, Jan. 31, for the sale of sufficient bonds at prices not in excess of 5% above par, to exhaust the sum of \$13,000 at the credit of the sinking fund. The trust deed provides for the drawing of bonds to be redeemed in the event of bondholders not offering to sell.

Toronto Ry. The receipts, and percentages paid to the city for 1916, compared with those for 1915, are as follows:

January, 1916—Receipts, \$473,784.15; city percentage, \$68,846.83.

January, 1915—Receipts, \$471,226.33; city percentage, \$70,486.33.

Winnipeg Electric Ry.:—

	Dec. 1915	Dec. 1914	Jan. 1 to Dec. 31, 1915	Jan. 1 to Dec. 31, 1914
Gross	\$377,121	\$368,100	\$3,199,711	\$3,199,711
Expenses	210,427	230,719	2,246,519	2,416,209
Net	166,694	137,381	1,253,222	1,685,093

Winnipeg Electric Ry.—At the adjourned annual meeting Feb. 24 it was announced that the financial statements would be issued in a few days thereafter. The directors were re-elected and J. D. McArthur, contractor, Winnipeg, was elected to fill the vacancy caused by Sir Wm. Van Horne's death. The following is the board for the current year:—Sir Wm. Mackenzie, President; A. M. Nanton, Vice President; F. Morton Morse, Secretary-Treasurer; Sir Donald Mann, D. B. Hanna, G. V. Hastings, Hugh Sutherland, J. D. McArthur, R. J. Mackenzie.

Marine Department

St. Lawrence Ship Channel Improvements.

During 1915, 15 dredges and attending plant were kept at work day and night, deepening and improving the ship channel, from Montreal to Island of Orleans, removing a total of 8,462,957 cub. yds. of material, varying from soft clay to hard shale rock. Considerable work was done widening the channel through Montreal harbor, in St. Mary's current and Longueuil shoal, where it is proposed to widen the channel from 700 to 800 ft. Good progress in deepening the channel to 35 ft. at extreme low water was made, between Three Rivers and Montreal, 8 miles having been accomplished. There remains very little of the channel through lake St. Peter that is not deepened to 35 ft. The Cap Charles channel, Cap-a-la-Roche district, was completed to 30 ft. at extreme low water, and widened from 300 to 450 ft. and to 650 ft. at the curve. A new range of lights was constructed to mark the new centre line. The channel was buoyed to give the increased width and opened to navigation. The Grondines channel was also completed to 30 ft. deep and 450 ft. wide. A new range of lights was built to mark the new centre line. This channel was also buoyed out to give the increased width. The widening of Cap-a-la-Roche curve is almost completed, but there remains considerable deepening and cleaning up to be done yet. There is a large area of rock which has been broken by the rock cutter, in readiness for work during the current year.

The new channel for light draught vessels and tows, through the islands opposite Sorel, to Lake St. Peter was completed to 15 ft. deep at low water and a minimum width of 400 ft. and will be opened for navigation in the spring. New lighthouses have been built to mark the different courses. This will oblige all tows, etc., to keep out of the ship channel. There is now a distance of over 50 miles, between Lake St. Peter and Montreal, where the tows and light draught vessels can keep out of the ship channel. This will avoid the delays and annoyance caused to ocean steamers by these vessels.

Dredging operations in the north channel below Quebec were carried on vigorously, and good progress was made, two dredges being kept at work during the whole season. They removed 2,197,568 cu. yds., there still remains 6,928,805 cu. yds. to be dredged. This channel is to be 1,000 ft. wide and is being deepened to 35 ft. at extreme low tide. Where there was only 7 ft. at low tide, there is now a depth of about 26 ft.

With the new dredge now building by Canadian Vickers, Ltd., Montreal, greater progress will be made. The completion of this dredge has been unavoidably delayed owing to conditions arising out of the war.

A commencement has been made on the construction of the compensation dams, as recommended by the commission appointed to investigate upon the water levels of the St. Lawrence river at and below Montreal. In order to lessen the cost, it was decided to utilize the dredging material taken from the ship channel and deposit it on the site of the proposed dam. A considerable amount was dumped at Repentigny (between Ile

a Bague and Ile Bellegarde), chenal Corbeaux (between Ile de Grace and Stone island), chenal des Barques (between Ile aux Barques and Ile du Moine), Pointe du Lac, at foot of Lake St. Peter. It is proposed to continue depositing at these points in the spring while the water is high, in order to be able to utilize as much of the dredged material as possible.

The Batiscan-Bengore Head Collision Judgment Reviewed.

The Minister of Marine has reviewed the sentence passed on Capt. Green of the s.s. Batiscan, in connection with the collision with the s.s. Bengore Head in the St. Lawrence River, Aug. 1, 1915. The sentence given by the Dominion Wreck Commissioner, and concurred in by one of the assessors, the other dissenting, was suspension of his master's certificate for two years, with the issue of a first mate's certificate for the second half of the suspension term. As mentioned in Canadian Railway and Marine World for Feb., this matter was taken up by the Mercantile Marine Association in England, of which the captain is a member, and the British Board of Trade was approached with a view to having the sentence changed, but without effect. It was then taken up with the Dominion Minister of Marine, and representations were made, pointing out "the severity of the punishment and its disproportion with sentences inflicted by other tribunals of like character, and suggesting that although the evidence before the court was conflicting, the penalty would be amply met by the issuing of a first mate's certificate to the master, and the suspension being reduced to one year." The Minister of Marine has confirmed the suspension of the master's certificate for the full two years, and has decided that a first mate's certificate be granted for the whole period of the suspension.

St. Lawrence River Navigation.

Mention has been made in Canadian Railway and Marine World, at intervals, of the undoubted bias which certain Liverpool interests evidence against the navigation of the St. Lawrence River. It is therefore somewhat pleasant to note report of the Liverpool Underwriters Association for 1915, from which the following is extracted:—"This subject has occupied the attention of the committee on frequent occasions during many years, and has been referred to repeatedly in these reports. It is gratifying to the committee to be able to state in this report that on the opening of navigation in May new regulations framed by the Dominion Government were brought into operation. Under these regulations separate channels were assigned for large and small vessels, so as to minimize the risk of collision, and a uniform system of lighting these channels by gas buoys and gas beacons was set up, those on the starboard hand going up stream being occulting red lights and those on the port hand occulting white lights. In addition to these improvements the pilotage system was placed on a more satisfactory footing, and instead of being controlled by a corporation, as heretofore, it is now in charge of the Minister of Marine and Fisheries."

Canada's Shipping Under Present War Conditions and its Future.

The condition of Canada's shipping under the existing circumstances, and the question as to what steps should be taken by the Government for its future development formed the chief topic of a discussion in the House of Commons, Feb. 10. A. K. Maclean, M.P. for Halifax questioned the Government as to whether it had, during the past year considered the idea of supplying some tonnage in Canada, or of encouraging it by advancing money for the construction of vessels. He pointed out that Canadian trade was likely to suffer in the future owing to the present lack of tonnage, and stated that France had undertaken to advance money to persons willing to buy ships or to have them built.

The Minister of Marine said that the subject had received the Government's serious consideration, but there were certain difficulties in the way. For the present, the Admiralty has assigned 53 vessels to the Atlantic trade, and these are taking away, from St. John and Halifax, Canadian goods, as fast, as the railway companies can get them to these ports, so that there is little disturbance of Canadian trade at present. In regard to the suggestion that people should be encouraged to increase tonnage, he said that the people did not appear disposed to put their money very largely into ships, the expense of building and the cost of raw materials being so high. Of course, on the other hand freights are exceedingly high, but there is great uncertainty as to how long such a condition will continue.

Hon. W. Pugsley contended that the Government should immediately take steps to encourage shipbuilding, irrespective of whether the war lasted one year or ten years, and members of other maritime constituencies stated that shipbuilding could not be carried on successfully in the Dominion so long as the present tariff obtained, because so long as British shipbuilders can build vessels from 35 to 50% below what they can be built for in Canada, there is little prospect of vessels being built to any extent on this side. Vessels built in Great Britain enter Canada without paying any duty, but Canadian shipbuilders have to pay high duty on a number of articles used in building vessels, adding, it is stated, \$10 a ton to the cost of building. It was pointed out that when certain machinery is built in Canada and exported, the manufacturer can obtain a rebate of 99% of the amount paid for duty on articles used in the manufacture of that machinery, and it was suggested that vessels built in Canada and exported, should be allowed the same rebate. Shippers should also be able to go into outside markets, purchase vessels and register them in Canada free of all duty, irrespective of where the vessel was built.

Shipbuilders throughout Canada have for several years been agitating for Government assistance in the building up of the shipbuilding trade, and have suggested subsidies for the home built article and high tariffs for the imported one, but no decision has been reached upon which any policy could be formulated, and the discussion above noted was purely academic.

Dry Dock Project at Vancouver, B.C.

The North Vancouver city council, at a meeting at the end of January, passed a resolution accepting the amended offer of the Amalgamated Dry Dock & Engineering Co. for the construction of a dry dock and shipbuilding plant at an estimated cost of \$5,458,418.37, and issuing instructions for the preparation of a by-law providing for a fixed assessment at a nominal rate for 35 years, and for the guaranteeing of bonds, as to principal only, to the extent of \$750,000, for submission to the ratepayers. In regard to a Dominion Government subsidy under the act granting aid for the construction of dry docks, it is said that application has been made to the Government for the subsidy, and while no subsidy agreement has been entered into, the Government has expressed its willingness to grant the aid provided the company can finance the undertaking. The dimensions of the proposed dock are as follows,—length from caisson stop to head wall 1,150 ft., width of entrance 110 ft., depth over sill at extreme high water spring tides 41 ft., depth over sill at low water spring tides 24.25 ft., the dock to be divided into two parts 650 and 500 ft., respectively. The subsidy provided by the Government would be at the rate of 4 per cent. for 35 years on an agreed capital expenditure. It is stated that arrangements for the financing of the project have been completed in New York.

Great Lakes Vessels in Ocean or Coasting Trade.

The Canadian Lake Protective Association has compiled the following particulars respecting lake steamships enrolled in the Association. On Aug. 4, 1915, the following vessels were down as engaged in Trans Atlantic or European trade or coasting south of the Gulf of St. Lawrence and in the West Indies:—Newona, Tagona, Kenora, Midland Queen, Glenellah, Dundee, Dunelm, Donnacona, Strathcona, Winona, Neepawah, C. A. Jaques, Turret Court, Scottish Hero, Neebing, Port Colborne, Dwyer, Glenfoyle, Glenmavis, Fairmount, Glenmount, Stormount, Westmount, Northmount, Kaministiquia. The Midland Queen, Dunelm, Donnacona and Fairmount were lost at sea.

On Aug. 4, 1915, the following vessels were trading between Montreal and Sydney, N.S.—Acadian, Canadian, D. A. Gordon, A. E. McKinstry, Renvoyle, Fordonian, Empress of Fort William, Empress of Midland, Rosedale, Meaford, Kinmount, Rosemount, Ungava, Turret Crown.

On Sept. 23, 1915, a list compiled showed slightly less than half of the above vessels returned to the lakes for the movement of the new crop with some few others to come in. In December, immediately after the close of navigation, a list compiled showed these vessels at sea:—Acadian, D. A. Gordon, A. E. McKinstry, Canadian, Empress of Midland, Stormount, Glenmount, Kinmount, Northmount, Rosemount, C. A. Jaques, Dundee, Glenellah, Scottish Hero, Empress of Fort William, Kenora, Neepawah, Renvoyle, Strathcona, Tagona, Winona, Newona, Neebing, Kaministiquia, G. R. Crowe, Glenfoyle, Glenmavis, Calgary, Port Colborne, Port Dalhousie, Dwyer, Algonquin. The Northmount was lost at sea in December and the G. R. Crowe and the Algonquin while still on the lakes have been sold for ocean trade.

Navigation by Masters with Coasting Certificates.

A bill was introduced in the House of Commons, Feb. 7, to amend the Canada Shipping Act, by repealing sec 3, ch. 65, of 1908, and to substitute the following:

(f) Coasting voyage means a voyage between any port or place on the eastern coast of Canada and any other port or place on such coast, or in Newfoundland, Labrador, St. Pierre or Miquelon, or any port or place on the eastern coast of the United States of America, Mexico, Central America or in the West Indies, or on the eastern coast of South America, not further south than 40 deg. south latitude; and also means a voyage between any port or place on the western coast of Canada and any other port or place on such coast, or on the western coast of the territory of Alaska, or of the United States of America, the western coast of Mexico, Central America or South America, not further south than 40 deg. south latitude."

A bill making similar provisions was introduced in 1914, and was referred to the Committee on Marine and Fisheries, where it rested.

On a discussion re masters' and mates' examinations, in the House of Commons, Feb. 10, this matter was mentioned, and the Minister of Marine said that he had suggested that in addition to a deep sea certificate, and a coasting certificate, there might be another certificate, which might be called a limited foreign certificate, enabling captains to go, not only on coasting voyages, but to greater distances than at present, and when the bill comes up, the Government will be in a position to give a matured opinion on the subject. It is stated that owing to the limitations of a coasting certificate many Canadian vessels have withdrawn from the register, and there is a tendency to register in the U. S. rather than in Canada.

Steamship Service between Great Britain and Sweden—A press dispatch stated to have been received from Stockholm, Sweden, via London, in commenting on a proposed steamship service between Great Britain, Sweden and Russia, says,—"It is learned that steam ferries carry merchandise trucks between Gothenburg, Sweden, and Birmingham, Eng., without trans-shipment." It would be interesting to know if these vessels are of what is known as the alligator type.

Government Aid to Shipbuilders in Great Britain—A Glasgow, Scotland press report states that the British Government has decided to grant facilities and financial assistance to shipbuilders, to complete about 500,000 tons of mercantile shipping which is nearing the launching and fitting out stages, and thus relieve the markets from the excessive freight rates.

The Blantyre Transportation and Coal Co., Ltd. has been incorporated under the Dominion Companies Act, with \$50,000 authorized capital and office at Montreal, to carry on a general lumber and coal business, and in connection therewith to own and operate steam and other vessels, and to carry passengers and merchandise.

The Long Sault Development Co's project to dam the St. Lawrence River at the Long Sault Rapids, is expected to come before the United States Supreme Court during March. The charter, which was granted by New York State, has been declared to be unconstitutional, and the company has filed an application for the reopening of its case.

Dominion Government Steamships and Icebreakers.

During a discussion in the House of Commons, Feb. 10, on a vote for \$1,180,000 for maintenance and repairs to Government steamships and icebreakers, the Minister of Marine stated that there are 27 vessels in the ocean and river service, viz,—Aberdeen, Aranmore, Bellechasse, Brant, Champlain, Dollard, Druid, Estevan, Frontenac, Grenville, Lady Grey, Lady Laurier, Lambton, Lansdowne, Maggie May, Montcalm, Montmagny, Newington, Prince Edward Island, Rouville, Scout, Shamrock, Simcoe, St. nley and Vercheres, and the new icebreaker now under construction at Montreal. The s.s. Montmagny was sunk in collision in the St. Lawrence about two years ago, and the Department has entered into a contract to raise the vessel and place her in dock at Levis, on the no cure no pay principle, for \$27,000. It is expected that the vessel will be successfully raised, repaired and ready for operation by the summer, and \$55,000 has been included in the estimate for such repair. The s.s. Prince Edward Island, which is really under the Department of Railways and Canals, as a car ferry, is being operated across Northumberland Strait in place of the s.s. Minto, sold to the Russian Government, and is giving satisfactory service. Four icebreakers are in service, the Lady Grey and Montcalm in the St. Lawrence, and the Prince Edward Island and Stanley in the Northumberland Strait between New Brunswick and Prince Edward Island.

British Columbia Merchant Marine Limited.

Reference was made in our last issue to arrangements which were being made for the organization of a company with the name of the British Columbia Merchant Marine, Ltd., to meet the requirements of the province as regards vessel accommodation, and develop shipbuilding. The Manufacturers' Association of British Columbia, an organization comprising all forms of industry in the province, announces that it is acting as godfather to the project, and is proceeding to inaugurate the movement for the formation of the company, to make the enterprise a provincial organization, to prepare draft incorporation papers as a basis on which the association can go to the public, to eliminate all question of watered stock, promotion expenses or commission, to ask the public to subscribe to a general scheme with the understanding that subscribers themselves elect a provisional board of directors who shall decide the company's policy in all respects, including the building and type of ships, trade routes and general handling of the routine of the business, to give the services of the association and its officers free to the new organization until it is handed over to the provisional directors, and after a thorough canvas of the province, to call a meeting of subscribers to elect a provisional directorate and thereupon to hand over to it the whole affairs of the incorporation for decision in regard to approaching the Government for assistance or otherwise.

From present indications it is the company's intention to build wooden vessels at first, and they will probably be equipped with Diesel oil engines. When the steel market is more favorable, steel vessels will probably be built.

Mainly About Marine People.

J. W. Norcross, Vice President and Managing Director, Canada Steamship Lines, Ltd., returned to Montreal, Feb. 2, after a business trip to England.

W. J. McCormack, heretofore Superintendent, Northern Navigation Co., Sarnia, Ont., has been appointed Superintendent, Algoma Central Steamship Line, Sault Ste. Marie, Ont., vice S. V. McLeod, resigned.

Capt. Alfred Ellis, formerly in the Canada Atlantic and Plant Line Steamship Co.'s service, died at Halifax, N.S., Feb. 5. He had been with the company for 25 years, and, at various times, had been in command of the steamships A. W. Perry, Evangeline and Halifax. He retired from active service in 1915, shortly after the loss of the company's s.s. A. W. Perry, on June 8.

Commander Engineer John Carmichael, R.N.R., who was awarded the D.S.O. recently for bravery and devotion to duty in mine sweeping and mine laying operations, is serving on the auxiliary cruiser Princess Marguerite, one of the vessels built recently in Scotland for the C.P.R. Pacific Coast Service, and which, with the s.s. Princess Irene, was taken over by the Admiralty early in the war. He was formerly chief engineer on the C.P.R. s.s. Charmer.

Alex Lewis, Secretary, Toronto Harbor Commission, who has been granted leave of absence and is at present a captain in the Queens Own Rifles, Toronto, will, it is said, be second in command of the Bantam Battalion which is to be organized in Toronto. **M. R. McCallum**, Assistant Secretary of the Commission, who has been acting as Secretary since Mr. Lewis was granted leave of absence, is also going to the front as Assistant Adjutant in the same battalion.

Hugh Strain Carmichael, whose appointment as Passenger and Freight Manager, Canadian Pacific Ocean Services, Ltd., London, England, was announced in our last issue, was born at Glasgow, Scotland, Mar. 7, 1874, and entered transportation service in Mar. 1889, since when he has been, to Apr. 7, 1891, in Passenger Department, State Line, Glasgow; Apr. 7, 1891, to Dec. 12, 1895, in Passenger Department, Allan Line, Glasgow; Dec. 13, 1895, to May 18, 1903, in Freight and Passenger Department, C.P.R., Glasgow; May 19, 1903, to June 30, 1905, in Passenger Department, C.P.R., Liverpool; July 1, 1905, to Apr. 14, 1907, Passenger Agent, C.P.R., Liverpool; Apr. 14, 1907, to Dec. 31, 1915, General Passenger Agent for Great Britain and Europe, C.P.R., London, Eng.

W. E. Burke, who has been elected President, Dominion Marine Association, for the current year, was born at Belleville, Ont., Sept. 23, 1881, and entered transportation service May 1, 1905, since when he has been, to Dec. 1, 1905, purser on s.s. Picton, Richelieu & Ontario Navigation Co., Montreal, and Toronto; Dec. 1, 1905, to Dec. 31, 1906, Soliciting Freight Agent, R. & O. N. Co., Toronto; Dec. 31, 1906, to Dec. 31, 1907, Travelling Freight Agent, same company, Toronto; Dec. 31, 1907, to Apr. 19, 1909, Travelling Freight Agent, Mutual Steamship Co., Toronto; Apr. 10, 1909, to Apr. 1, 1910, General Freight Agent, Merchants' Mutual Line, Toronto; Apr. 1, 1910, to Jan. 1, 1914, Traffic Manager, Merchants' Mutual Line, Toronto; since Jan. 1, 1914, Assistant Manager, Canada Steamship Lines, Ltd., Montreal and Toronto.

Shipping Federation of Canada.

The annual meeting was held at Montreal, Feb. 9, when the report showed that 810 vessels arrived at Montreal during 1915, against 916 in 1914. A large



W. E. Burke.
Assistant Manager, Canada Steamship Lines, Ltd.,
and President, Dominion Marine Association.



H. S. Carmichael.
Passenger and Freight Manager, Canadian Pacific
Ocean Services, Limited.

number of the vessels usually trading with Canada were requisitioned by the Admiralty for war purposes, and a number of tramps were engaged for the extra export business. Nine vessels enrolled

with the Federation were lost owing to German submarines. In most of the exports, large increases were shown, but considerable decreases took place in the quantities of grain and flour shipped. (It ought to be mentioned here, that, owing to shortage of tonnage, and other causes, large quantities of Canadian wheat and flour were shipped to Europe from U. S. ports. EDITOR.)

The President, A. A. Allan, paid tribute to the co-operation of the shipping companies and their employees, in connection with war shipments, including the transportation of troops, and also stated that the thanks of the Federation were due to the Minister and Deputy Minister of Marine, for the attention given to all matters brought to their attention, and also to the Militia Department.

The officers for the current year are:—President, A. A. Allan; Treasurer, J. R. Binning; Assistant Treasurer, E. W. Foulds; Executive Committee A. A. Allan; W. R. Eakin, J. R. Binning, R. W. Reford, D. W. Campbell, Jno. Torrance and A. MacKenzie; sub-committees, bill of lading, W. I. Gear, John Torrance, J. R. Binning and D. A. Watt; harbor equipment, A. A. Allan, W. I. Gear and John Torrance; Manager and Secretary, Thos. Robb.

Atlantic and Pacific Ocean Marine.

Furness Withy and Co. have purchased the steamship Kilbridge, Kilchattan and Kilkerran, from Connel Bros. Ltd., Glasgow, Scotland. The first named was built in 1901 and the two latter in 1906.

The C.P.R. s.s. Princess Ena, of the British Columbia Coast Service, is now running between Vancouver and Vladivostok, with war supplies. She was operated on the Alaskan run with freight cargoes for some time, but has been laid up at Victoria for about 18 months.

The C.P.R., s.s. Metagama, which had been for some time, under requisition by the Admiralty, and released, was scheduled to sail in her regular service, from St. John, N. B., Feb. 5. Her sailings have however been cancelled for the present, as she has again been requisitioned by the Admiralty.

The Union Steamship Co. of New Zealand's s.s. Leirtrim has been completed at Middlesbrough, Eng., and has undergone her open sea trials, which were reported as satisfactory. She is of the three deck type with bridge and forecastle, and has a deadweight capacity of 13,000 tons. Her dimensions are, length 491 ft. 7 ins., breadth 60 ft., depth 39 ft. 4 ins.

The crew of the s.s. Beothic returned to St. John's, Nfld., Feb. 1, from Archangel, Russia, where they had taken the vessel for use as an icebreaker by the Russian Government. She sailed from Sydney, N.S., Nov. 23, 1915, via Belle Isle Strait and the coast of Greenland, and reached the White Sea, Dec. 9. On account of ice conditions there, delivery of the vessel was made at Vega, instead of Archangel, and the crew returned via Petrograd, Newcastle-upon-Tyne, Eng. and St. John, N. B.

The s.s. Paliki, stated to be owned by F. E. Hall and Co., Montreal, and now lying at Liverpool, England, is reported sold there for £28,500. She was formerly owned by the Algoma Central Steamship Line, a subsidiary of the Algoma Central and Hudson Bay Ry., and has been under charter for Atlantic service for some time. She was built at Sunderland, Eng.

in 1889, and is of steel construction and equipped with triple expansion engines with cylinders 19, 30 and 48 ins. diam., by 36 ins. stroke, supplied with steam by a Scotch boiler 15½ by 10½ ft. at 180 lbs. Her dimensions are, length 240 ft., breadth 36 ft., depth 17 ft., tonnage, 1,578 gross, 993 register.

Canada Steamship Lines s.s. Dunelm, which sailed from Sydney, N. S. in Oct. 1915, for Manchester, Eng., and after reporting from Cape Race, Oct. 17, has not since been heard from, has now been officially declared as missing. She was built at Sunderland, Eng. in 1907, for R. O. & A. B. Mackay, Hamilton, Ont., and was later absorbed, with other vessels of that company, into Inland Lines Ltd., and eventually into Canada Steamship Lines Ltd. She was of steel construction with steel tank top, steel boiler house, four water tight bulkheads, hatches spaced 24 ft. centres, complete electric plant, and was also equipped with triple expansion engines with cylinders 19½, 33 and 54 ins. diam., by 36 ins. stroke, supplied with steam by 2 Scotch boilers under forced draught, 12½ by 11½ ft., 180 lbs. Her dimensions were, length 250 ft., breadth 43 ft. 1 in., depth 26½ ft.; tonnage, 2,318 gross, 1,480 register. Along with other vessels under the same ownership, she was chartered for Atlantic Ocean service about a year ago, and has since been running to and from English ports.

Maritime Provinces and Newfoundland.

A press report states that W. F. Coaker, St. John's Nfld., intends to erect a shipbuilding plant at Catalina, on the north shore of the colony.

The Marine Department fog alarm station and oil store at Cape Spencer, Bay of Fundy, was burnt out, Feb. 5, the damage being estimated at \$6,000.

The Miramichi Navigation Co's board of directors as elected at the recent annual meeting at Chatham, N. B., is as follows: Hon J. P. Burchill, President; J. D. Creaghen, Vice President; John McDonald, W. B. Snowball, J. D. B. F. McKenzie, Robt. Murray and R. A. Snowball.

It is announced that it was decided at a recent meeting of directors of the Nova Scotia Steel and Coal Co., to take up in a practical way the building of steel vessels at New Glasgow, or Ternton, N.S., and that the company will experiment on the matter by building a vessel for its own use.

The Nova Scotia schooner H. R. Silver, bound from St. John's Nfld. to Brazil with fish, was abandoned at sea recently, and the crew saved by the s.s. Carthaginian, and landed early in Feb. at Halifax. The vessel has been reported as a floating derelict and a menace to navigation.

The Minister of Marine and Fisheries announced in the House of Commons, Feb. 9, that regulations have been issued requiring French trawlers, after coaling at Canadian ports, and obtaining clearance, to give an undertaking not to fish within 12 miles of land, and the Dominion Government is exercising the necessary supervision to prevent breaches of such undertaking.

The Victoria Steamship Co's s.s. Victoria was burned to the water's edge, Feb. 4, while in winter quarters at St. John, N. B. There was no watchman on board, and the origin of the fire is un-

known. The loss is stated to be covered by insurance. She was built at St. John in 1897, and was equipped with machinery from the old U. S. s.s. St. Lawrence, which was taken to St. John during the civil war. For the past 18 years she has provided a service between St. John and Fredericton, but has not been financially successful. Arrangements were in progress for a change of ownership, the control having passed from St. John to Fredericton hands, with a view, it is said of selling to a U. S. syndicate. Her dimensions were, length 191.2 ft., breadth 30 ft., depth 7.9 ft.; tonnage, 1,002 gross, 631 register.

Ontario and the Great Lakes.

The Chatham, Ont., Board of Trade is arranging to send a deputation to the Dominion Government to urge that the Thames River be dredged as far as Chatham, so that lake vessels will be able to navigate to that point.

A press report states that Canada Steamship Lines s.s. Rochester will take the place of the Northern Navigation Co's s.s. Majestic recently destroyed by fire, during next summer. The Northern Navigation Co. is a subsidiary of Canada Steamship Lines Ltd.

A. B. Mackay, formerly of R. O. & A. B. Mackay, Hamilton, who has recently been engaged in buying and selling steamships, has issued a writ against the Reid Wrecking Co., Sarnia, for the recovery of \$12,000 said to be due on an agreement of sale in connection with a vessel.

The s.s. L. C. Waldo, formerly owned by the Roby Transportation Co., Detroit, Mich., and wrecked during the storm on the Great Lakes in Nov. 1913, and abandoned as a total loss, has, after being salvaged and overhauled, been re-registered at Toronto, under the name of Riverton. She is owned by the Mathews Steamship Co., Toronto.

The Niagara, St. Catharines and Toronto Navigation Co's s.s. Garden City has had her engines overhauled during the winter. There is no confirmation of the press report that the company is negotiating for the sale of the Garden City, and for the purchase of the s.s. Rapids King from Canada Steamship Lines Ltd.

The U. S. Survey reports the levels of the Great Lakes in feet above tidewater for Jan., as follows: Superior 602.59; Michigan and Huron 579.22; Erie 571.68; Ontario 245.05. Compared with the average January levels for the past ten years, Superior was 0.62 ft. above; Michigan and Huron 0.76 ft. below; Erie 0.09 ft. below and Ontario 0.51 ft. below.

The Public Works Department has completed the dredging of a channel 22 ft. deep from the north point of Low Island, Lake Huron, west of Little Current, to deep water west of Picnic Island. The cut between the two islands is 200 ft. wide, and is to be increased to 300 ft. The channel will be marked by buoys by the reopening of navigation.

A press report from Michigan states that the U. S. Government will spend between \$100,000 and \$200,000 during the current year, on bettering the waterways, erecting lights and improving conditions generally for mariners, in the neighborhood of Keeweenaw Point. At Five Mile Point, about five miles southeast of Eagle River, a lighthouse is to be built, costing about \$75,000.

The International Joint Waterways

Commission held meetings at International Falls, Minn., at the end of Jan., to hear evidence regarding the levels of Rainy Lake and Rainy River, which, it is alleged have been lowered by the development of water power at International Falls by the Minnesota and Ontario Power Co. Evidence was also taken with the view of maintaining a regular level in the Lake of the Woods.

The Great Lakes Transportation Co., of which Jas. Playfair, of Midland, Ont., is President, is reported to have purchased the s.s. A. E. Stewart from the Stewart Transportation Co., Detroit Mich., for \$225,000. She was built at West Bay City, Mich. in 1902, of steel on the channel system with steel tank top, three watertight and two non-watertight bulkheads, steel boiler house, steam pump wells and complete electric light plant. She was built under special survey and is equipped with triple expansion engines with cylinders 20, 33 and 45 in. diam. by 42 in. stroke, 1,100 i.h.p. at 85 r.p.m., and is supplied with steam by 2 Scotch boilers, 14 by 12 ft. at 170 lbs. Her dimensions are, length 356 ft., breadth 50 ft., depth 28 ft.; tonnage, 3,943 gross, 2,049 register.

British Columbia and Pacific Coast.

The Grand Trunk Pacific Coast Steamship Co's s.s. Prince Rupert has resumed service between Vancouver, Prince Rupert and Anyox after overhauling, replacing the s.s. Prince George, which is now being overhauled.

The Dominion Government lighthouse and buoy tending steamship Quadra, which broke one of her propeller blades recently, has been repaired at Esquimalt, and has returned to the Gulf of Georgia, where an acetylene beacon buoy is being established on the Drew Harbor spit in the Sutil channel.

The West Vancouver Ferry Co. has instructed its Secretary to offer to sell its assets to the municipality for the amount of its outstanding liabilities. It is stated that a majority of the ratepayers favor the proposal, and it is likely that a bylaw will be submitted at an early date, to authorize the purchase.

A press report from Vancouver states that the C.P.R. will put on an increased steamship service between Victoria and the north during the coming summer, owing to the heavy advance bookings for the season. The s.s. Princess Charlotte will it is said be utilized during June, which is the heaviest traffic month on this route.

At a meeting of the Port Moody, B.C., City Council, Feb. 8, a proposal, said to emanate from a group of prominent shipping interests, was discussed. It was announced that an option had been obtained on certain land with a large water frontage on Burrard Inlet, and provided certain concessions could be secured, it was the intention to locate a large shipbuilding plant there.

The St. Michael's Trading Co., Wrangel, Alaska, will operate a bi-weekly launch service between Wrangel and Telegraph Creek, during next summer. The vessels will be driven by gasoline power, and will have accommodation for about 12 passengers and five tons of freight. The service will be from the opening of navigation about the end of May, to the close of navigation early in October. The trip occupies about three days.

The Alaska Steamship Co's s.s. Mari-

posa, which was wrecked in the Lama Passage, Oct. 8, 1915, is being overhauled and repaired at Esquimalt. She was floated on Nov. 23, by the British Columbia Salvage Co., and repairs to the hull were made at Seattle, the balance of the work being undertaken by Yarrows Ltd. It is stated that the repairs will cost about \$250,000, and that when completed, the vessel will re-enter the Alaska trade.

The Grand Trunk Pacific Coast Steamship Co. announces that it will extend its service to Alaska next summer. It is stated that the service will probably be started by one of the company's smaller vessels, but during the tourist season, the steamships Prince George and Prince Rupert will be run through from Seattle, Victoria, Vancouver to Prince Rupert, Ketchikan, Wrangel, Juneau and Skagway. A tri-weekly service will be run between Seattle and Prince Rupert and a weekly service between Prince Rupert and Skagway.

British Control of Shipping.—An Imperial order in council has been issued providing for a more stringent control of shipping. After Mar. 1, no British vessel exceeding 500 tons, except it is engaged in the coasting trade, will be allowed to proceed on any voyage, unless a license to do so has been granted by the Board of Trade. Another order in council provides for a restriction of imports, so that a number of vessels may be released for war purposes. Almost the whole of the steamships engaged in Canadian trade are registered in Great Britain, but as these have been, more or less, engaged in war trade since the commencement of the war, it is not anticipated that they can suffer any further restriction.

The Wire Drag has revolutionized hydrographic surveying, says the annual report of the United States Coast and Geodetic Survey. It has long been realized that soundings with the leadline, no matter how carefully and closely spaced, were not infallible, and that submerged rocks and ledges were often missed, as has been demonstrated by numerous wrecks and frequent damage due to striking unknown rocks in surveyed waters; but with the development of wire drag hydrography, these submerged dangers have been discovered and charted.

The Huntsville, Lake of Bays and Lake Simcoe Navigation Co's annual meeting was held at Huntsville, Ont., Feb. 11, when the annual report was adopted. The balance remaining in hand for 1915 was carried to the credit of profit and loss, no dividend being declared. The directors were re-elected as follows:—C. O. Shaw, Huntsville, President; H. Foster Caffee, Brockville, Ont., Vice President; W. J. Moore, Huntsville, General Manager and Secretary; J. W. McKee, Huntsville, Treasurer.

Harbor Expenditure at Port Nelson.—Replying to questions in the House of Commons on Feb. 8, the Minister of Railways and Canals stated that expenditures on dredging, lighting and other improvements at Port Nelson, Hudson Bay, so far as his department was concerned, were, to Jan. 1, 1916, \$5,018,711.74, and estimated amount required to complete the work, \$5,000,000.

Montreal Transportation Co. Ltd.—The board of directors elected for the current year at the recent annual meeting, is as follows:—B. McLennan, President; Farquhar Robertson, Vice President; L. L. Henderson, Managing Director; H. A. Calvin, A. Kingman, G. L. Ogilvie and A. G. Thomson. The Secretary is W. Crawford.

Montreal Harbor Commissioners Propose Railway Electrification.

An important feature of the Montreal Harbor Board's annual report is the section dealing with the electrification of the existing harbor railways, and the necessary future extension of the same. The report says:—"The increase in the railway traffic of the port and the mileage of trackage in operation makes it important to proceed with the utmost dispatch in establishing facilities which will not only retain Canadian trade, but which, by their superiority over those provided at competitive ports, will attract additional business. With this object in view the commissioners have, during the past year, devoted much time and thought to a study of a scheme for the complete electrification of the harbor railway terminals, visiting and inspecting in the meantime the electric freight terminals of the New York Central, Pennsylvania, and New York, New Haven & Hartford Railroads at New York, Oak Point, New Rochelle, etc., where the application of electricity had proved successful in the movement of freight at the various terminals. It was also ascertained that, in addition to the primary object of overcoming the smoke nuisance, the application of electricity had proved that it had, among many other, the following advantages over steam for railroad traction:—Economy in operation and maintenance; flexibility of control; availability for immediate service; fewer units required for equal service; elimination of corrosion of steel and galvanized iron by acid gases; fire danger reduced; and standby losses much lowered. As a result of this investigation, an expert electrical engineer has, for some time

past, been engaged in studying on the ground the railway conditions of the port, and preparing a report as to designs, types and estimates, upon receipt of which it is proposed, should the report confirm the conclusions arrived at by the commissioners, to proceed at once with the work of completely electrifying the Montreal harbor terminals, upon the consummation of which Montreal will have the distinction of being the first port in the world possessing a complete system of electrified freight terminals."

The report also deals with the question of the extension of the harbor works in order to cope with the growing necessities of the port. One part of the plans under consideration includes the erection of a bridge from the Mackay Pier to St. Helens Island and thence to the south shore of the St. Lawrence. This bridge, it is suggested, will be 90 ft. wide, providing for 2 footpaths, street railway tracks and railwa ytracks, the latter being electrified in the same manner as it is proposed the rest of the harbor tracks will be, and these railways will be connected up with the lines now in operation on the south shore. The proposed extension of the Bickerdike and Mackay Piers will permit the building of a railway which will give direct communication with the main shore wharves of the harbor and the two piers, instead of the traffic having to go almost up to the G.T.R. yards and the Victoria Bridge before getting to the piers.

The traffic returns show an increase of more than 15 per cent.; the total cars handled being 157,480 against 114,449 in 1914. The commissioners' railway department was organized in 1907, in which year 70,856 cars were handled. The disbursements on capital account during 1915 so far as the railway is concerned were \$145,065.93.

Grain in Store at Terminal Elevators, Interior Terminal Elevators and at Public Elevators in the East.

Week ending Feb. 11, 1916.	Wheat. bushels.	Oats. bushels.	Barley. bushels.	Flax. bushels.	Totals. bushels.
Port William—					
C.P.R.	3,651,794	819,775	321,802	.....	4,793,371
Consolidated Elevator Co.	1,157,957	322,881	43,616	80,203	1,604,657
Empire Elevator Co.	1,544,450	475,469	110,426	171,912	2,302,257
Ogilvie Flour Mills Co.	940,673	198,099	58,138	.....	1,196,910
Western Terminal Elevator Co.	1,369,355	327,464	42,151	117,224	1,856,194
G.T. Pacific	3,443,331	2,055,338	126,670	114,316	5,739,655
Grain Growers' Grain Co.	1,618,983	617,718	173,937	.....	2,310,638
Port William Elevator Co.	996,502	400,404	42,796	31,463	1,471,165
Eastern Terminal Elevator Co.	761,726	182,734	48,675	.....	993,135
Port Arthur—					
Port Arthur Elevator Co.	4,551,343	2,028,023	343,624	94,525	7,017,515
D. Horn & Co.	157,137	103,057	13,913	138,878	412,985
Dominion Government Elevator	2,125,853	876,649	105,754	76,349	3,184,605
Grain afloat	1,973,657	973,311	.....	.....	2,946,968
Total Terminal Elevators	24,192,761	9,380,922	1,431,502	824,870	35,830,055
Calgary Dom. Govt. Elev.	12,192	94,199	5,339	.....	111,730
Saskatoon Dom. Govt. Elev.	1,439,404	235,453	16,095	30,587	1,721,539
Moose Jaw Dom. Govt. Elev.	644,069	93,236	5,354	9,658	752,317
Total Interior Terminal Elevators..	2,095,665	422,888	26,788	40,245	2,585,586
Depot Harbor	147,645	.....	.....	.....	147,645
Midland—					
Aberdeen Elevator Co.	355,152	.....	.....	.....	355,152
Midland Elevator Co.	63,804	151,860	.....	.....	215,664
Tiffin, G.T.P.	810,165	678,494	189	.....	1,488,848
Port McNicoll	1,938,968	98,847	22,703	.....	2,060,518
Collingwood ....	.....	.....	.....	.....	.....
Goderich Elevator & Transit Co.	671,953	115,218	.....	.....	787,171
Kingston—					
Montreal Transportation Co. ....	.....	.....	.....	.....	.....
Commercial Elevator Co.	8,624	41,590	.....	.....	50,214
Port Colborne	610,751	738,301	.....	8,920	1,357,972
Prescott ....	.....	.....	.....	.....	.....
Montreal—					
Harbor Commissioners No. 1	471,410	.....	.....	.....	471,410
Harbor Commissioners No. 2	535,839	1,001,995	112,079	.....	1,649,913
Montreal Warehousing Co.	32,387	1,101,086	1,391	.....	1,134,864
Quebec Harbor Commissioners	57,804	26,066	3,404	.....	87,274
West St. John, N.B.	963,788	133,633	183,712	.....	1,281,133
Halifax, N.S. ....	.....	.....	.....	.....	.....
Total Public Elevators	6,668,290	4,087,090	323,478	8,920	11,087,778
Total Quantity in Store	32,956,716	13,890,900	1,781,768	874,035	49,503,419

Canadian Lake Protective Association's Annual Meeting.

At the annual meeting in Toronto Feb. 3, the ex-officio Chairman, W. E. Burke, of the Canada Steamship Lines, President of the Dominion Marine Association, presided. The report, which is given in full below, was unanimously adopted. The following were elected as the executive committee: W. J. Bassett, Bassett Steamship Co.; R. Duguid, Canada Steamship Lines; G. E. Fair, Farrar Transportation Co.; Robt. Fraser, Montreal Transportation Co.; Gilbert Johnston, Canada Steamship Lines; A. E. Mathews, J. T. Mathews, Mathews Steamship Co.; W. L. Reed, Canadian Northwest Steamship Co.; J. Waller, Keystone Transportation Co.; A. A. Wright, St. Lawrence & Chicago Steam Navigation Co. The President of the Dominion Marine Association is ex officio Chairman of the Canadian Lake Protective Association.

Following is the annual report signed by A. E. Mathews, Chairman of the committee, and Francis King, Counsel for the Association.

In this brief summary of the Association's work during 1915, inasmuch as the chief purpose of the organization is to secure safe navigation and so cut down the losses due to preventable casualties, first place is given to the statement that once more the records show that no vessel enrolled has been lost within the waters over which the Association exercises any supervision. The committee is also pleased to note that the accidents which have occurred, with the exception of a few glaring cases of which special mention will be made, have been for the most part either unavoidable, excusable or of comparatively little moment. It is regrettable that the exceptions referred to mar the record, but even here one finds cause for congratulation in that the serious cases are so few in number and that in the analysis substantial fault is found to be attributable to so few of the master mariners with whom your committee has had to deal. Several lake vessels have been lost in foreign waters during the past season, but it must be noted here that these losses are purely incidental to existing war conditions, and have no bearing upon the records covered by this report, which, as will be again stated in a later paragraph, relate only to casualties occurring within the limits covered by a master's certificate for inland waters.

Weather conditions have on the whole been favorable, except during the late autumn, when heavy gales prevailed. But water has been low and a number of accidents are attributable to this cause. In the St. Lawrence this may have been particularly noticeable and draft permitted has in some cases been restricted to less than the customary canal limit.

An appendix sets out the casualties of the year under the usual headings. Strandings and groundings have again been grouped together according to the method adopted by the committee of 1914, and together they number 28, an increase of 10 over 1914. Under this heading are to be found all the serious casualties reported for the year, excepting one of grave moment which appears in the list of collisions, and one or two fairly serious but not so culpable in connection with locking in the canals. Of these 28 groundings or strandings, one at the opening of navigation in the Kaministiquia River was stated to be due to ice formed on the steamer's bottom during the winter, one was on a submerged obstruction close to a harbor dock, one was

a rubbing contact in the Rapide Plat of the St. Lawrence, one was a similar contact with the Maxwell Shoal in the St. Lawrence marked on the charts as having been removed, several of a similar nature and on account of low water conditions occurred in other narrow channels, five of comparatively slight importance were in the canals or canal approaches, one was a deliberate beaching of the ship at the difficult upper entrance to the Morrisburg Canal for the purpose of avoiding collision with an upbound tug and tow, and one was a deliberate beaching in a gale to avoid foundering when the ship sprang a leak which could not be controlled.

In addition to the above the list of groundings contained one or two cases of varying importance due to fog. The records are faulty in two cases in which the masters, having been summarily dealt with by owners, failed to report to the Association. The default of the master and the owner's action in each case has been noted in the records and may be considered later as occasion arises. A peculiar case that received special consideration and resulted in much correspondence and finally in a vote of censure was a stranding on Blake Point Shoal, Lake Superior, due to Blake Point gas buoy being mistaken for Passage Island Light which was not yet burning at the date of the accident. A stranding on Drummond Island eight miles east of Detour on a course from the Ducks is still under consideration. The remaining cases of special importance were strandings on Niagara Shoal in Lake Ontario, on Gull Island Shoal below Clayton in the St. Lawrence River, on the Olympia Shoal between Kingston and Knapp's Point in the St. Lawrence, and on a shoal adjoining Red Island off the mouth of the Saguenay River. All these four cases were considered quite inexcusable and votes of censure have been recorded against master or pilot. Wreck investigations have been held by the Dominion Wreck Commissioner in two of these cases and his judgments contain severe condemnation of the pilots. In one of the four cases an investigation asked for has only been delayed by the absence of the master, who left the lakes on one of the boats which went into the ocean trade.

The list of collisions, numbering 15 as against 23 in 1914, includes five cases of but slight importance which occurred in making landings at or moving near docks, seven involving comparatively light damage in one or other of the canals when with one unimportant exception steamers enrolled in this Association come in contact with dredges, scows, buoys or other vessels of outside classes, and two more of equally slight importance, one with an anchored schooner improperly lighted and one with a motor launch, in the rivers. In no one of these 14 cases referred to did your committee impute blame to the master, and in accordance with the settled rule in the one case involving two vessels enrolled in the Association consideration was deferred pending negotiation between the owners. The 15th case, however, was no light matter and on the contrary its serious character is a blot on what would have been an exceptionally clean collision record. On July 12, in a dead calm, about six miles off Presqu'île in Lake Huron, the Wahcondah rammed and sank the whaleback Choctaw while going full speed in a dense fog. There seem to have been no redeeming features

in the manoeuvres to avoid the impending collision or in the subsequent efforts to rescue the crew of the Choctaw, all of whom were nevertheless fortunately able to take to their boats and were ultimately picked up by the Wahcondah. The master of the Wahcondah was censured and brought before the Wreck Commissioner, with the result that his certificate was suspended for the remainder of the season.

There are 10 cases of canal damage reported, due to striking walls or gates. In one only were gates broken by a vessel enrolled in the Association. The case well exemplified the risk run through the failure of the canal authorities to equip the gates with safety devices. On May 3 the Rosemount, snubbing in ordinary course and in the usual manner in a lock of the Lachine Canal, touched the headgates by reason of the steel snubbing cable slipping in the steamer's compressor. Forced but a few inches out of mitre, the headgates fell back under the head of water above, and the Rosemount was swept out of the lock, serious damage being only averted by prompt action of the master, who brought the ship up on her anchors. The committee passed this case without censure, but in one other in which the steamer's engines, ordered astern, were put ahead, an engineer was censured. Fortunately in this case no serious damage resulted. The other eight cases were passed, after due consideration of each, making allowances in every case for the peculiar difficulties attendant upon canal navigation and especially for those due to the cross currents developed by waste weirs and power sluices. In none of the 13 cases also reported relating to contact with docks, bridges, and harbors and channel banks was the damage serious and in each of these cases the committee believed the circumstances such that no fault could be attributed to the navigator.

To review, after giving careful consideration to each case as it arose, the committee passed them all except the one collision above particularly mentioned, one striking of lock gates, and eight of the strandings or groundings. Nine votes of censure were recorded, three upon masters engaged as such, four upon masters engaged on lake vessels as pilots or sailing masters, one upon a mate, and one upon an engineer, while in three cases, through the Wreck Commissioner's Court, penalties were also imposed by way of suspension of certificates; in one case that of a master engaged as such, in one case that of a mate, in one case that of a master engaged as sailing master on a lake vessel. One serious stranding is still under consideration.

It devolved upon your committee to deal also with some six or seven reports relating to 1914 casualties which had either been held over during that year pending investigation of circumstances, or were filed after the close of the season too late for consideration and final action. These were in due course considered and all were passed with the exception of one case in which a vote of censure was recorded against the master on account of the absence of a certificated officer from the bridge when the ship grounded while making a bend in the St. Mary's River.

These casualty reports constantly raise questions as to the need of improvement or alteration of conditions with relation to currents, depths, obstructions or aids

to navigation and they form a fruitful source of information and suggestion with regard to all the travelled routes. The committee has endeavored to make good use of suggestions received in this way and has brought to the attention of the authorities whatever information or recommendations it seemed proper to present from time to time. In four cases where obstructions were reported arrangements were made for sweeping of channels and the necessary removal of boulders or other deposits. In certain other cases buoys were found to be improperly placed and their rearrangement with the addition of necessary extra spars was brought about. The plea of a master that no information is available at the Canadian ports at the head of the lakes as to the dates of lighting or discontinuing aids to navigation maintained by the United States led to correspondence with a view to having definite information in this respect furnished to The Lake Shippers Clearance Association at Fort William. Steps have also been taken in the hope of having Harbor Beach, Lake Huron, improved so as to permit its use as a harbor of refuge by vessels of any draft.

The canal casualties in particular have led to renewed efforts to improve conditions. The records by no means indicate the real extent of the damages received in canalling, and it would appear that masters continue to refrain from filing reports regarding their slighter accidents and the less embarrassing difficulties they encounter, but the reports filed indicate clearly enough the urgent need of various improvement for which this Association has repeatedly asked. The installation of comparatively simple and inexpensive devices would go far to lessen or prevent the difficulties complained of, and your committee has on several occasions during the season filed recommendations accordingly at Ottawa.

An urgent petition has been presented asking for attention to previous requests for the adoption of means to prevent lock gates from giving way under water pressure when forced slightly out of mitre. Very recently the matter has been followed up by letters to the superintendents of the various canals asking for a free expression of opinion and advice regarding the practicability of the proposal and as to the best method to adopt. The committee suggest that the answers received and the information already referred to in correspondence be made use of by a deputation in personal interview with the Minister and officials of the Department of Railways and Canals at Ottawa. The committee has also renewed the request for protection of lock entrances by clusters of spring spiles, floating booms or other devices, and as the recommendation has apparently received no attention it should also be discussed with the authorities at the proposed interview. Casualties arising from cross currents and low water in the canals have in some special instances revived complaints and correspondence during the past season, but apparently these questions must be dealt with chiefly in connection with the general discussion of power development, as to which a better and more definite understanding with the Dominion Government is being urged by the Dominion Marine Association.

Perhaps the most startling instances of the inadequacy of the protection given vessels in the canals is found in the system or lack of system in lighting lock gates at night. By a custom now practically universal, bridges when closed to navigation show a red light to approach-

ing vessels. One would expect a light of the same color to be exhibited to an approaching vessel on every pair of lock gates when they are closed against the ship. But while the red light is found in use on some of the canals it is found exhibited on the closed gate visible upstream and downstream at the same time with the apparent intention that a vessel approaching from either direction may distinguish which pair of gates, upper or lower, is closed, but with the result that an approaching pilot is not always able to distinguish readily which pair of gates carries the light. Again in other canals a white light is used and not always in the same position, and in some the light is merely carried out of the lock house on to the canal bank. The lack of uniformity in method is serious and the opportunity for trouble to arise through error or neglect of operators is all too apparent. The matter was called prominently to the attention of the committee by an accident in one of the canals this season which led to some dispute as to the proper character and location of the signal light, and the committee after investigation recommended to the Department the simple expedient of placing a red light, screened on three sides, on the top of the outer end of one of each pair of gates, to be visible only upstream on a pair of closed head gates, and only downstream on a pair of closed footgates, and invisible up or downstream when the gates are open. The absence of a red light would then indicate to an approaching vessel that the lock is open, while the presence of a red light must prove it closed. It is important that this recommendation should be pressed further upon the attention of the authorities.

The one serious collision which involved a vessel of this Association during the season, occurring as it did in mid-lake, causing the total loss of the other ship and almost entailing serious loss of life, revived discussion of the double courses in Lake Huron and led your committee finally to recommend to all masters of boats enrolled in the Association the adoption of the exact courses recommended to masters of ships enrolled in the sister association of the United States. In this connection the committee also took up the question of double courses for Lake Superior, suggesting that for that lake the courses in fog be laid east and west of Caribou Island. The Great Lakes Protective Association, to which the suggestion was submitted because of the entrance of U. S. tonnage into this trade at certain seasons of the year, recommended that the proposed courses be used in all weathers. The committee determined to consult masters on the subject before coming to any conclusion. Of the answers received, only one agreed in the proposal. The great majority objected strongly, alleging a variety of reasons, chief among which were the invisibility of Caribou Light to the eastward, and the suggestion that the inconvenience and loss of time would have no real compensating advantages. Under the circumstances your committee has not pressed the suggestion and at its last meeting determined to drop the proposal.

The stranding of the Glenmount on Gull Island Shoal below Clayton, N.Y., and the subsequent wreck investigation in which the pilot was severely censured, proved the inadequacy of the means adopted in 1914 to bring the pilots of the Upper St. Lawrence under the jurisdiction of the Wreck Commissioner. The regulation adopted during 1914 by this Association required that no one should

be engaged as a pilot for these waters unless he held a certificate as master which would be subject to suspension or cancellation by the Commissioner. But in the Glenmount case the Commissioner, while not sparing the pilot in his comments upon the navigation of the ship, nevertheless held that he could not impose a penalty on a man who was not "an officer of the vessel." The matter was later discussed by the Counsel for the Association with the Deputy Minister of Marine and by the Deputy Minister with the Department of Justice, and in the end with the consent of the Department, the committee recommended that these pilots must not only comply with the previous requirements as to holding master's certificates but must also be signed on the ship's articles as mate and pilot.

The officers of three vessels enrolled in the Association were under examination in the Wreck Commissioner's court this season. In the Glenmount case above mentioned the master was absolved and the pilot found in fault. The latter's certificate was not dealt with for the reason mentioned in the preceding paragraph. In the case of the Haddington, which grounded at Red Island off the mouth of the Saguenay, the regular officers of the ship were also absolved but the sailing master engaged for the lower St. Lawrence and Gulf was censured and his certificate suspended for six months. The third case was the Wahcondah-Choctaw collision and, as stated elsewhere, severe censure was passed upon master and mate of the Wahcondah and their certificates were suspended for twelve and six months respectively.

The insurance rate for 1915 risks was substantially reduced and policies contained some new concessions. It is understood that the standard rates paid on steel hulls covering to the foot of Lake Erie for a period of one year with a navigating season from April 15 at midnight to Nov. 30 at midnight was 3¼ per cent. The usual extra ½ per cent. for the season was charged for navigation not east of Kingston, with a further ½ per cent. for navigation not east of Montreal, while an additional ½ per cent. was charged for navigation as far as Cape Breton. A new and welcome provision in the policies this year extended the sailing season up to December 12 at midnight on payment of an additional 1 per cent., and permitted a boat to make a one-way trip after Nov. 30 at the following fractional charges:—Sailing up to midnight Dec. 5, ½ per cent.; sailing up to midnight Dec. 8, ¾ per cent.; sailing up to midnight Dec. 12, 1 per cent., or to make a one way trip on one lake after Dec. 12 at ¼ per cent. additional. The policies also gave the new privilege of navigating from April 1 to 15 in the ensuing season of 1916 at pro rata of the season rate.

Recently the committee has again had under consideration the form of the policy and has taken action by way of protest against the deductible average clause, recommending to underwriters that the clause serves no good purpose and that its omission from the policy would be in the best interest of all parties. The committee also recommended to underwriters that the layup rebate clause should be amended to provide for additional proportionate rebate for any number of days in excess of the 15 day period covered by the clause. Brokers have been advised of these recommendations and asked to assist.

On account of the withdrawal of a great number of boats from ordinary trade routes by the exigencies of the war,

quite a number of vessels enrolled in this Association left the lakes during 1915 to engage in trade on the ocean, some of them going under charter along the Atlantic coast and as far in some cases as the coast of South America, while others crossed the ocean and in some cases engaged more or less permanently in European trade. A considerable number of these vessels returned to the Great Lakes for the fall trade, not only because of the ordinary inducements in that trade, but also because the Minister of Trade and Commerce raised the question of the possibility of shortage of Canadian tonnage on the lakes and consequent suspension of the coasting laws. A considerable number remain at sea and five unfortunately have been totally lost, one of them having been torpedoed, one not reported, two foundered, and one stranded in the West Indies. Questions arose naturally as to the extent of the jurisdiction this Association should exercise under these circumstances, and underwriters having also made enquiry on the subject, the committee decided at a meeting in Toronto on Aug. 11 that the Association should deal only with casualties occurring within the limits covered by certificates issued to masters for inland waters. No doubt all members of the Association will concur in this at the annual general meeting.

The bulletins issued in 1915 have been sent to all masters of enrolled steamers, to all members of the Association, and to the various underwriters and brokers interested. Circular letters have been issued to members as occasion arose, and a mass of correspondence has been conducted regarding the special questions raised by the casualty reports and in connection with the various other matters referred to in the foregoing paragraphs. No general meetings have been held since the annual meeting as the matters dealt with have been all within the powers of the committee. Members of the Association have nevertheless been kept advised of special action taken at any time, and have corresponded fully on subjects of special or general interest. If all would make full use of the privileges of membership and co-operate with the officers by suggestion and advice as to the conduct of the Association's work, it would be of great advantage to the undertaking.

Special benefits will come from strict compliance with the rule as to filing reports and all members are asked to see that their masters are supplied with forms and use them on all occasions. This is a matter peculiarly within the power of the management of ships, and co-operation in this respect is essential. Owners receiving reports should also see that they are promptly filed with the Association and should themselves send in notice where for any reason the master is known to have failed or to be likely to fail in complying with the rule.

ANALYSIS OF ACCIDENTS REPORTED. 1915.	
Groundings	28
Collisions	15
Striking locks or gates	10
Striking bridges, docks, piers and harbor and channel banks	13
Accidents to machinery or other gear through stress of weather or otherwise	9
Damage by ice	1
Watchman killed	1
Total	77

Groundings.	
St. Lawrence canals	4
St. Lawrence River	9
Lake Ontario	3
Welland Canal	2
St. Clair River	2
Lake Huron	1
Georgian Bay	1
North Channel	1
Straits of Mackinac	1

St. Mary's River	1
Lake Superior	2
Kaministiquia River	1
Total	28

Collisions.	
Harbors	4
St. Lawrence canals	2
Welland Canal	1
Detroit River	1
Lake Huron	1
St. Mary's River	1
Total	15

Striking Locks or Gates.	
Lachine Canal	1
Cornwall Canal	4
Morrisburg Canal	1
Welland Canal	4
Total	10

Striking Bridges, Docks, Piers and Harbor and Channel Banks.	
Bridges	2
Docks and piers	8
Banks	3
Total	13

Accidents to Machinery or Other Gear Through Stress of Weather or Otherwise.	
(All in open water in one or other of the Lakes)	9

Ice Damage.	
Lake Superior	1

Watchman Killed.	
St. Lawrence River	1

Correspondence was read regarding alterations asked for in the 1916 marine insurance policy with respect to the deductible average and layup rebate clauses and the matter was referred to the executive committee for the current year.

Dominion Marine Association's Annual Meeting.

The annual meeting was held in Toronto Feb. 3, the President, A. E. Mathews, of the Mathews Steamship Co., in the chair. The executive committee presented a comprehensive report over the signatures of the President and of the Counsel, F. King, showing that the tonnage enrolled continues to increase, the steam tonnage being now over 210,000 net registered tons against about 200,000 tons in 1914, although naturally enough the barge or sailing tonnage shows some slight decrease, the figures being just over 32,000 as against 33,500 in 1914. The report dealt in full detail with the past year's work, including the following subjects: Legislation; Canada Shipping Act; bill to place carriers by water under Board of Railway Commissioners; Seamen's Bill, United States; grain cargoes, discrepancies in weights and the bill of lading; amendment of the Grain Act; trimming of cargoes; elevator hours; coasting laws; sessions of the Grain Commission; rules of the road, piloting on the Upper St. Lawrence; U. S. customs report of entry into Lake Michigan; masters for British registered ships in the coasting trade; competition of unregistered and unlicensed small craft, including motor boats; screening of bituminous coal in bond; power development; the canals, New Welland Canal, Lake Ontario entrance, Morrisburg Canal upper entrance, lighting of the Cardinal Canal, military regulations for canal protection, bulletin boards, general improvements; harbor and channel improvements, Kaministiquia River, channel at Algoma Central dock, Little Current, Goderich Harbor, Port Colborne Harbor, Port Dalhousie, Port Weller, Trenton Harbor, Kingston Harbor, St. Lawrence River, Lachine cut; aids to navigation; new school of navigation; lake vessels in ocean trade, general business, membership and tonnage. The report was unanimously adopted.

It was decided that the executive com-

mittee seek a continuance of the method of adjustment of grain cargo outturns in force during 1915.

The question of trimming arrangements at Fort William, including that of installing mechanical devices, was referred to the executive committee with a request for prompt action. The President announced the withdrawal of the trimming charges at Port Colborne.

The question of procuring authority to sign river pilots on ships' articles in advance of their boarding the vessels, and if possible for a number of ships and for considerable periods, was referred to the Canadian Lake Protective Association with request for action and with the suggestion that the Association's counsel discuss the matter with the Marine Department and endeavor to procure a favorable ruling upon some practical method.

The competition of unlicensed motor boats and other small craft was discussed and it was decided to request the speedy enactment of the provisions of the bill to amend the Canada Shipping Act, which would to some extent provide the desired remedy.

The decided opinions of the Association previously expressed at various times, are to be again presented to the Dominion Government, in the general terms that no water should be diverted from the St. Lawrence River for power purposes unless in accordance with some comprehensive scheme for the development of the whole river worked out by commission or otherwise, and that the interests of navigation be consistently treated as paramount.

The executive committee was asked to seek an interview with the Minister of Marine and to urge upon him the installation of safety devices on lock gates, spring spiles or guiding booms at lock entrances and properly adjusted automatically operated signal lights on lock gates, as recommended in the report.

A resolution from the Kingston Board of Trade, calling attention to the need of immediate preparation of Kingston harbor, to accommodate vessels which will pass through the Welland Ship Canal, and asking the Association to assist in bringing the matter before the Government, was approved and the executive committee was asked to petition for surveys, plans and proposals and for such further action as the Government may feel able to take.

The President reported upon the new 14 ft. Canadian channel through the Thousand Islands and presented plans of the same. It was decided to congratulate the authorities upon the completion of the undertaking. Later in the day the Canadian Lake Protective Association agreed to endeavor to bring about the use of this channel and to co-operate in testing it and proving its practicability.

Four members of the executive committee retired by effluxion of time, namely, L. Henderson, Montreal Transportation Co.; G. E. Fair, Farrar Transportation Co.; H. H. Gildersleeve, Northern Navigation Co., and H. W. Richardson, Great Lakes Transportation Co. Messrs. Henderson & Fair were re-elected, and James Playfair, Great Lakes Transportation Co., and J. F. M. Stewart, Lake Commerce, Ltd., and Point Anne Quarries, Ltd., were elected to succeed Messrs. Gildersleeve and Richardson. The other members of the committee are as follows: Term expiring in 1917—H. W. Cowan, Canada Steamship Lines; C. B. Harris, Canadian Lake & Ocean Navigation Co.; W. J. McCormack, Algoma Central Steamship Co. (who was elected to succeed S. V. McLeod, who is on active

military service); A. A. Wright, St. Lawrence & Chicago Steam Navigation Co. Term expiring in 1917—A. E. Mathews, Mathews Steamship Co.; W. L. Reed, Canadian Northwest Steamship Co.; D. Murphy, Ottawa Transportation Co.; W. E. Burke, Canada Steamship Lines.

The executive committee elected the following officers: President, W. E. Burke, Canada Steamship Lines; First Vice President, G. E. Fair, Farrar Transportation Co.; Second Vice President, A. E. Mathews, Mathews Steamship Co.

The following were elected as a committee on aids to navigation. A. A. Wright, St. Lawrence & Chicago Steam Navigation Co.; Robt. Fraser, Montreal Transportation Co.; Gilbert Johnson, R. Duguid, Canada Steamship Lines; James Playfair, Great Lakes Transportation Co.; J. F. Sowards, Kingston, Ont.; A. E. Mathews, Mathews Steamship Co.

Among the Express Companies.

J. H. Whitehouse has been appointed agent, Dominion Ex. Co., Cranbrook, B.C., vice C. Potter, transferred to the messenger service.

E. J. Wearing, who has been acting General Agent, Canadian Ex. Co., Liverpool, Eng., since the death of W. Cuthbertson, has been appointed General Agent.

The Canadian Northern Ex. Co. has placed its service in effect over the Canadian Northern Ry. from Luxton to Estevan, Canora to Sturgis Jct., Elrose Jct. to Dumblane, Elrose to Eston and Laird to Carlton, Sask.

The Assistant Adjutant and Quarter Master General of the Canadian Training Division at Shorncliffe, England, has written the Canadian Ex. Co., in complimentary terms regarding the handling of parcels for the troops at that point.

The Canadian Northern Ex. Co. has opened offices at Bolger, Caramat, Devlin and Mowat, Ont.; Amaranth, Man.; Bienfait, Dumblane, Estevan, Eston and Plato, Sask.; Carrot Creek, Alta., and Ashcroft, Langley, Lytton and Matsqui, B.C.

The Toronto City Council is asking that the matter of the extension of express collection and delivery limits for the city, which has been before the Board of Railway Commissioners for some time, be taken up, and the Board requested to expedite a judgment.

The Dominion Ex. Co. has opened offices at Dragon, Que.; Nicholson, Ont.; Storthoaks, Man., and Portreeve, Sask.; and has closed its offices at Penfield and Jardine Brook, N.B.; Burnside, Oberon and Stockton, Man.; Yeomans, Sask., and Edgewood and Westholme, B.C.

The British Government has dropped the case against E. Wienacht, formerly Manager, Adams Ex. Co., London, Eng., for trading with the enemy. The charge was that he had transferred about 5,000 marks from London to the company's agent at Hamburg, Germany. For the defence it was claimed that the transaction was completed at Rotterdam, Holland, and that the intention in transferring the money was to utilize it in Holland, as it was worthless in England.

The Canadian Ex. Co.'s receipts and expenditures for Sept., 1915, compared with those for Sept., 1914, are as follows:

	1915	1914
Mileage covered	10,238	9,676
Charges for transportation....	\$374,451	\$296,134
Express privileges, Dr.	197,200	150,184
Operation other than transportation	4,881	5,187
Total operating revenue	182,132	151,137
Operating expenses	144,075	132,607
Net operating revenue	38,056	18,529
Express taxes	4,200	4,000
Operating income	33,776	14,529

The American Ex. Co. has readjusted its divisions in New England states and Quebec, as follows,—all offices in Maine hitherto in the Massachusetts division, now constitute the Maine division; all offices in New Hampshire hitherto in the Massachusetts division, now form the Vermont, New Hampshire and Quebec division; all offices in Massachusetts and Connecticut, hitherto in the Vermont, New Hampshire and Quebec division, now form the Massachusetts division; and American Ex. Co. and National Ex. Co. offices in Greater Boston form the Boston division.

Telegraph, Telephone and Cable Matters.

The Great North Western Telegraph Co. has opened offices at Bas les Ebolements, Capucins, Daaquam, English Lake and Les Ebolements wharf, Que.; Amaranth and Fisher Branch, Man., and Plato, Sask., and has closed its office at Parry, Sask.

Belvidere Brooks, Vice President Western Union Telegraph Co., died suddenly at New York, Feb. 10. He was born at Wheelock, Tex., July 6, 1859, and entered Western Union service in 1879 as an operator.

The Montreal Telegraph Co.'s report for the past year gives the total assets as \$2,311,683. Cash, accounts, receivable and securities make up \$159,859 of this amount. The lines are operated under lease by the Great North Western Telegraph Co. The excess in value of property operated by the G. N. W. T. Co. over shareholders' capital is given at \$151,895.85.

The Anglo-American Telegraph Co. has paid a balance dividend of 1½ per cent. on the ordinary consolidated stock, for 1915, making a total dividend of 3¼ per cent.; a balance dividend of 1½ per cent. on the preferred stock, making a total of 6 per cent. for the year, and a first and final dividend of 1½ per cent. on the deferred stock. In addition, a bonus of 1s. 9d. per cent. on the undivided ordinary stock and 3s. 6d. per cent. on the deferred stock, was declared payable Feb. 1 to shareholders of record at Dec. 31, 1915.

Various reports from different sources state that seven of the telegraphic cables connecting America with Great Britain have been cut recently, and that this has caused some delay in the transmission of messages, by overloading other cables. This report has been denied by several of the companies interested, and they also state that any delay which may have occurred has been caused by general congestion of business, which caused the temporary suspension of deferred messages at lower rates, which latter have now been resumed.

Questions asked in the House of Commons, Feb. 10, relating to the suspension of deferred cablegrams with Great Britain, elicited the information that the Western Union Telegraph Co.'s rates for soldiers cabling from Europe were not interfered with, and the suspension of deferred rates and week end messages from Canada had been cancelled. The Commercial Cable Co. accepts no deferred or week end cables to or from Canada, but soldiers messages are not interfered with. The Marconi Wireless Telegraph Co. suspended all deferred and week end rates, the special rate for soldiers still being in operation. The Anglo-American Telegraph Co. is not accepting deferred cables for dispatch from Europe, but is receiving such matter from Canada. The Board of Railway Commissioners announced that the C.P.R. had announced its inability to accept deferred cables, and this resulted in the business being turned over to the Great North Western Telegraph Co. and the Marconi Wireless Telegraph Co., and these latter companies were unable to handle it. For this reason they temporarily suspended the acceptance of these cables, but since Feb. 1, the G.N.W.T. Co. has accepted them. The Board of Railway Commissioners has no authority over cable or wireless telegraph companies operating across the oceans.

Hotel Dennis

ATLANTIC CITY, N.J.

An American Plan Hotel that for the past fifteen years has been under the same management and developed on lines that appeal to people of refined taste.

It has a superior location. It is thoroughly modern. It is a recognized standard of excellence.

Capacity 600.

WALTER J. BUZBY

Ottawa Traction Company, Limited

Second Annual Report for Year Ending December 31, 1915

Your directors have much pleasure in submitting their second annual report for the year ending 31st December, 1915, including the operation of The Ottawa Electric Railway Company.

Gross earnings of The Ottawa Electric Railway Company were ..\$1,041,100 26
Operating expenses and maintenance 657,325 68

Net earnings\$ 383,774 58
Net earnings, 1914 431,232 41

Decrease 1915\$ 47,457 83
The net earnings were disposed of as follows:—
Four quarterly dividends of 3% and a bonus of 3%\$ 281,535 00
Interest on bonds and loans 47,926 54
Mileage payments 17,216 71
Taxes 19,654 87
Transferred to credit or profit and loss 17,441 46

Passengers carried in 1915 24,361,867
Passengers carried in 1914 25,321,547

Decrease 1915 959,680
In common with all other street railways throughout the country the depressing effects of the war were felt by this company during the past year, but not to as great an extent as might have been anticipated. The month of August showed the greatest falling off in receipts, since which time business has been normal, and generally showing a slight increase over 1914. In the meantime no new work is contemplated, our efforts being directed to the maintenance of the road bed and equipment in an efficient state in order to give the best service possible to the public.

All of which is respectfully submitted.

T. AHEARN,
President.

Ottawa, 7th February, 1916.

THE OTTAWA ELECTRIC RAILWAY COMPANY.

STATEMENT OF ASSETS AND LIABILITIES, 31ST DECEMBER, 1915.

Assets.

Roadbed and equipment,
water power property

and plant, real estate
and buildings\$3,281,211 80
Cash 6,695 00
Stores 53,545 60
Insurance paid on account of period beyond December 31, 1915.... 5,000 00
Accounts receivable 1,750 00
\$3,348,202 40

Liabilities.

Capital stock\$1,876,900 00
First mortgage bonds .. 440,000 00
Bills payable 423,600 00
Dividend No. 87, payable January 2nd, 1916 ... 112,614 00
Interest on bonds, payable January 5th, 1916 8,800 00
Bank of Ottawa 16,318 77
Accounts payable 51,734 12
Unpaid dividends 520 67
Contingent account 10,000 00
Rest account 200,000 00
Profit and loss account.. 207,714 84
\$3,348,202 40

Profit and Loss Account.

Balance at credit of profit and loss, 31st December, 1914\$ 190,273 38
Net earnings, year ending 31st Dec., 1915 ... 383,774 58
\$ 574,047 96

Dividend No. 84, April 1st, 1915, 3%\$56,307.
Dividend No. 85, July 1st, 1915, 3% 56,307.
Dividend No. 86, Oct. 1st, 1915, 3% 56,307.
Dividend No. 87, payable Jan. 2, 1916, 3% and bonus 3% .. 112,614.
\$ 281,535 00
Taxes 19,654 87
Mileage payments 17,216 71
Interest on bonds and loans 47,926 54
Balance at credit of profit and loss, 31st December, 1915 207,714 84
\$ 574,047 96

Certified correct,

JAMES D. FRASER,
H. T. BURPEE,
Auditor.

Ottawa, 7th February, 1916.

OTTAWA TRACTION COMPANY, LIMITED.

STATEMENT OF ASSETS AND LIABILITIES, 31ST DECEMBER, 1915.

Assets.

17,224 shares of The Ottawa Electric Railway Company. Par value \$100 each\$5,167,200 00

Liabilities.

Capital stock\$5,167,200 00

RECEIPTS AND PAYMENTS FOR YEAR ENDING 31ST DECEMBER, 1915.

Receipts.

Dividends received from The Ottawa Electric Railway Company .. \$ 257,910 00

Payments.

Dividend No. 4, April 1st, 1915, 1%\$51,354.
Dividend No. 5, July 1st, 1915, 1% 51,606.
Dividend No. 6, Oct. 1st, 1915, 1% 51,606.
Dividend No. 7, payable Jan. 2, 1916, 1% and bonus 1% ... 103,344.
\$ 257,910 00

Certified correct,

JAMES D. FRASER,
H. T. BURPEE,
Auditor.

Ottawa, February 7th, 1916.

OTTAWA TRACTION COMPANY, LIMITED.

Directors.

T. AHEARN - President.
WARREN Y. SOPER, Vice-President.
T. F. AHEARN. R. QUAIN.
E. N. SOPER. J. F. SMELLIE.
T. WORKMAN. JAS. D. FRASER.

THE OTTAWA ELECTRIC RAILWAY COMPANY.

Directors.

T. AHEARN - President.
WARREN Y. SOPER, Vice-President.
T. F. AHEARN. T. WORKMAN.
E. N. SOPER. R. QUAIN.
JAMES D. FRASER.
JAMES D. FRASER - Sec'y-Treas.

Sessions-Standard
Friction Draft Gear

Simplest and Best

Both
Made by

Standard Coupler Co.

30 CHURCH STREET, NEW YORK

Standard Steel
Platforms

Used by all Canadian Railways

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Franklin Railway Supply Co., New York and Montreal, has issued a booklet, *McLaughlin Flexible Conduit, Franklin Ball Joints and Franklin Single Water Joint*, 28 pgs., 6 x 9 ins., describing and illustrating the specialties named.

Goldschmidt Thermit Co.—The quarterly *Reactions* contains a number of illustrated descriptions of thermit welds on railway rolling stock, and also on stern wheel shafts and rudder stocks of steamships. Results of prize contests for articles on thermit welding are also announced.

The Brown Hoisting Machinery Co., Cleveland, Ohio, has issued a catalogue, *Brownhoist Tramrail Systems, Trolleys, Electric Hoists*, 68 pp., 6 x 9 ins., illustrated. Among the illustrations, is one of two Brownhoist monorail man trolleys, each equipped with a Brownhoist patented grab bucket, as installed for the Ottawa Gas Co., Ottawa, Ont.

The Scherzer Rolling Lift Bridge Co., Chicago, announces that following the death of Albert H. Scherzer, President, the entire stock of the company has been purchased by a syndicate of its officials who have been connected with the business from its inception, and that there will be no change in the personnel of the organization, Mr. Scherzer having taken no active part in the company's affairs for several years.

Goldschmidt Thermit Co., 103 Richmond St. West, Toronto, have issued a large wall calendar containing a map of most of the United States and Canada, on which is shown territories in which eastern, central, mountain and Pacific times respectively are in use. In addition to a monthly calendar there are also given a number of illustrations of the use of the Thermit process for welding, etc.

Lyman Tube & Supply Co., Ltd.—F. D. Lyman, who bought recently from John Millen & Son, Ltd., their railway supply department, announces that it will be conducted hereafter as Lyman Tube & Supply Co., Ltd., instead of the name first chosen, Lyman & Lyman Ltd. The head office is at 323 St. James St., Montreal, with a branch at 90 Adelaide St. West, Toronto.

The Shipmasters' Association of the Great Lakes, at its recent annual meetings at Toronto, elected the following officers for the current year:—President, W. J. Crosby, Detroit, Mich.; First Vice President, A. W. Stalker, Toledo, Ohio; Second Vice President, J. B. Mann, Toronto; Treasurer, J. H. MacDonald, Toledo, Ohio. The next annual meeting will be held at Cleveland, Ohio.

The C. P. R. steamship service from Summerland, on Okanagan Lake, B.C., has been temporarily suspended on account of ice, and tickets are now being sold via Okanagan Landing beyond Summerland.



“There is Satisfaction in Using the Best”

ROBERT'S AND SCHAEFER CO.

ENGINEERS AND CONTRACTORS
CHICAGO, U. S. A.

“Fulfill the Contract” “Satisfy the Client”

We Sell "Automatic" Car Ventilators

"Intake-and-Exhaust" and "Exhaust" types. Write for "Car Ventilation" booklet.

"Flower" Brush Holders

For all standard G. E. and Westinghouse motors; also Bushed Controller and Air Handles, D-Shaped, Steel Tubing, etc.

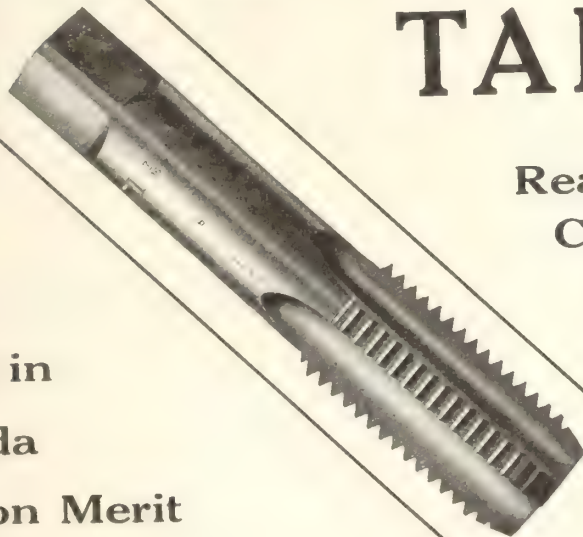
"Universal" Trolley Wheels and Harps

"Avco" Ball-and-Socket Strap Hangers
The kind that prevent strap breakage and save law-suits.

Automatic Ventilator Company

2 Rector Street

New York, N.Y.



TAPS

Reamers
Cutters
Drills
Dies

Made in

Canada

Sold on Merit

Ask for our new catalogue No. 8

Pratt & Whitney Co.

of Canada, Limited

DUNDAS

ONTARIO

Montreal

Vancouver

Winnipeg

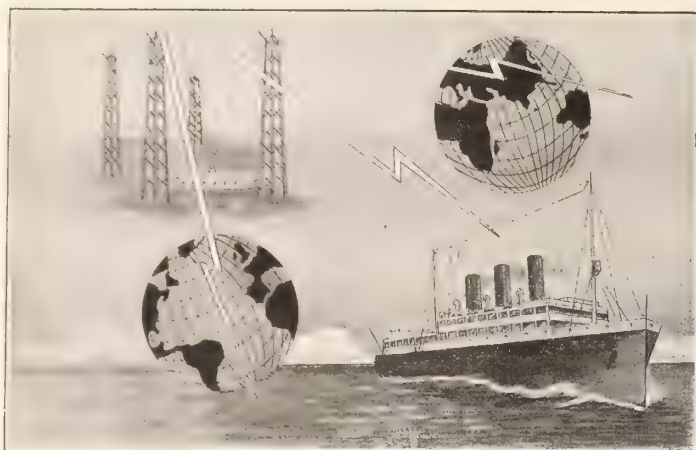
Transportation Conventions in 1916.

March 21-23.—American Railway Engineering Association, Atlantic City, N.J.
May.—International Railway Fuel Association, Chicago, Ill.
May, 2-5.—Air Brake Association, Atlanta, Ga.
May 17.—Freight Claim Association, Washington, D.C.
May 19.—Association of Railway Claim Agents, Atlantic City, N.J.
May 23-26.—Master Boiler Makers' Association, Cleveland, Ohio.
June 14-17.—Master Car Builders' Association, Atlantic City, N.J.
June 19-22.—American Railway Master Mechanics' Association, Atlantic City, N.J.
June 20-22.—Association of Railway Telegraph Superintendents, St. Paul, Minn.
June 20-23.—American Association of Freight Agents, Cincinnati, Ohio.
June 21.—Train Despatchers' Association of America, Toronto.
June 21.—American Association of General Baggage Agents, Boston, Mass.
June 28.—Association of American Railway Accounting Officers, Detroit, Mich.
July.—International Railway General Foremen's Association.
August.—International Railroad Blacksmiths' Association, Chicago, Ill.
September.—Master Car and Locomotive Painters' Association of United States and Canada, Wilmington, Del.
September.—Railway Signal Association, Mackinac Island, Mich.
September 19-22.—Roadmasters and Maintenance of Way Association, Chicago, Ill.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated:
Canadian Car Service Bureau—J. Reilly, Manager, 401 St. Nicholas Building, Montreal.
Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.
Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.
Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.
Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July, and August.
Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.
Canadian Ticket Agents' Associations—E. de la Hooke, London, Ont.
Dominion Marine Association—F. King, Counsel, Kingston, Ont.
Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.
Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.
Engineers' Club of Toronto—R. B. Wolsey, 91 King Street West, Toronto.
Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.
Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.
Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.
International Water Lines Passenger Association—M. R. Nelson, New York.
Niagara Frontier Summer Rate Committee—James Morrison, Montreal.
Nova Scotia Society of Engineers—A. R. McCreave, Halifax, N.S.
Quebec Transportation Club—A. F. Dion, Quebec.
Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.
Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.
Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.
Western Canada Railway Club—Louis Kon, Box 1707, Winnipeg. Meetings at Winnipeg, 2nd Monday each month, except June, July, and August.
Winnipeg Traffic Club, James Gehrey, Bannatyne Avenue, Winnipeg, Man.

Tides in Hudson Bay and Strait.—The Department of Naval Service has issued a pamphlet giving details of the tides in Hudson Bay and Strait, with tables showing high and low water conditions at Port Nelson for July, Aug., Sept. and Oct. of this year. The material was prepared under the direction of W. Bell Dawson, D.Sc., M.Inst.C.E., Superintendent of Tidal and Current Survey.



MADE IN CANADA

Marconi Wireless Telegraph Apparatus

Ship sets suitable for liners, yachts, tugs, freighters and scows our speciality.

Have you considered the advantage of connecting up factory or mine to head office by wireless? We will sell or rent you a system to cover all your requirements.

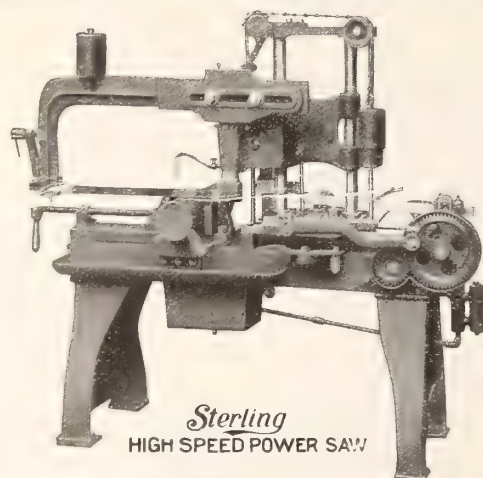
Of the world's wireless stations 80% are **Marconi**.

Consult: "**Marconi**" the World-Wide Wireless

Canadian Marconi Company

Head Office, 137 McGill St., Montreal

"STERLING" Hack Saws



Sterling
HIGH SPEED POWER SAW

A Combination that will save money for you.

Manufactured by

Diamond Saw & Stamping Works
Buffalo, N.Y. U.S.A.

Car Closets

Flush or Dry

DUNER CO.

101 S. CLINTON ST.
CHICAGO

The Toronto, Hamilton, and Buffalo Railway Company.

Notice is hereby given that The Toronto, Hamilton & Buffalo Railway Company will apply to the Parliament of Canada, at the present session thereof, for an act ratifying and confirming an agreement between The Toronto, Hamilton & Buffalo Railway Company, the Michigan Central Railroad Company, the Canada Southern Railway Company, the New York Central Railroad Company, the Canadian Pacific Railway Company, and the Trust Company, dated 1st February, 1915, making certain traffic arrangements or agreements authorized by section 364 of The Railway Act, for a term of fifty years, and providing for the guarantee of the payment of the consolidated mortgage bonds to be issued by The Toronto, Hamilton & Buffalo Railway Company, and for other purposes.

Dated at Hamilton, this 3rd day of February, A.D. 1916. **E. D. CAHILL,**

Solicitor for the applicant.

CANADIAN PACIFIC RY. COMPANY.

DIVIDEND NOTICE.

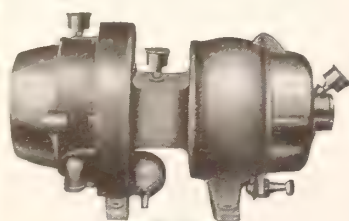
At a meeting of the Board of Directors, held today, the following dividends were declared:—

On the Preference Stock, two per cent. for the half-year ended 31st December last.

On the Common Stock, two and one-half per cent. for the quarter ended 31st December last, being at the rate of seven per cent. per annum from revenue and three per cent. per annum from Special Income Account.

Both dividends are payable 1st April next to Shareholders of record at 3 p.m. on 1st March next.

By order of the Board,
W. R. BAKER, Secretary.
Montreal, 14th February, 1916.



70 Schroeder Incandescent Headlights

In Service

270 days without any expense for repairs.

As a result of this exceptional service 150 more have just been ordered.

The HIRAM L. PIPER CO., Limited

MONTREAL, Sole Agents for Canada

Dominion Bridge Company, Limited

Head Office and Works,
MONTREAL, P. Q.

Branch Offices and Works,
TORONTO, OTTAWA and WINNIPEG



Lachine Bridge

Engineers, Manufacturers and Erectors of Steel Structures.
CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

Large Stock of Standard Structural Material at all Works.

"BEATTY" HOISTS

For situation where the work is severe and the service exacting "a Beatty always fills the bill"



Derrick car engaged with an 8 x 12 four drum Beatty Hoist placing an 80 foot deck plate girder span in Skugog River Bridge.

Let us know your requirements for
Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

We will gladly send full information.

M. Beatty & Sons Limited - Welland

Toronto Office—Goodyear Bldg. Telephone Adelaide 208.

Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg, Winnipeg.



STANDARD Signal Wires

include a complete line of high grade products among which are

Copper Wire

C.C.C. Wire
(Colonial Copper Clad)

Bronze Wire
High Strength

We can supply them bare or insulated with weatherproof braid or rubber.

Write our nearest office.

Standard
Underground
Cable Co. of
Canada,
Limited

Hamilton, Ont.

Montreal, Que.

Winnipeg, Man.

Seattle, Wash.

Rails, Cars, Locomotives

and Contractors' Equipment

IMMEDIATE
SHIPMENT

John J. Gartshore

58 Front St. West
TORONTO

When a Patron Leaves
the Choice of a Beer

to your good judgment, serve him with

DREWRY'S American STYLE RICE BEER

He'll remember your house with pleasure,—and will come again.

E. L. Drewry, Ltd., Winnipeg



Which Method

prevails in your plant? Does it take two men to do one man's work.

Why don't you replace that old antiquated tool with a new up to date

Reece's New Screw Plate

These pictures do not exaggerate conditions as you can actually see them, if you will visit Machine Shops throughout the country.

Lessen your cost by giving your mechanics a REECE'S NEW SCREW PLATE.

Butterfield & Co., Inc.
Rock Island, Que.

Hunt-Spiller Gun Iron

IN

Locomotive Castings

SAVES MONEY

INCREASES: Engine Efficiency—Engine Mileage.

DECREASES: Engine Failures—Engine Repairs.

MADE ONLY BY

Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.

J. G. Platt,
Sales Manager.

Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.

ESTABLISHED 1849.

BRADSTREET'S

Capital and Surplus, \$1,500,000.
Offices throughout the Civilized World.

Executive Offices:
NOS. 346 and 348 BROADWAY,
N.Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished, and are available only by reputable wholesale, jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA:

Halifax, N.S.; Hamilton, Ont.; London, Ont.;
Montreal, Que.; Ottawa, Ont.; Quebec, Que.;
St. John N.B.; Toronto, Ont.; Vancouver, B.C.;
Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.;
Victoria, B.C.

THOS. C. IRVING,

Gen. Man. Western Canada, Toronto.



Capital Authorized.....\$10,000,000
Capital Paid up.....7,000,000
Reserve Fund.....7,000,000

Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the World.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.

Consolidated

600 volt—Switches—1800 volt

ARE

MECHANICALLY AND ELECTRICALLY
CORRECT

Write us for further information.

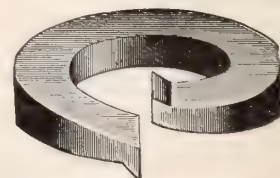
Consolidated Car-Heating Co.

New York — Albany — Chicago

DAWSON & CO., AGENTS
148 McGill Street, MONTREAL, QUEBEC.

The Positive Lock Washer

is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks

The Positive Lock Washer Co.

Sole Mfrs., Newark, N.J.

F. H. HOPKINS & CO.,

Agents, Montreal

Professional Cards

The Terry & Tench Co., Inc.

Bridge Builders, Manufacturers of Derricks, Erection Plant and Shipyard Cranes. Contractors, Structural Steel, Erection.

Grand Central Terminal, Room 517,
New York, N.Y.

THE ARNOLD COMPANY

ENGINEERS—CONSTRUCTORS.
ELECTRICAL—CIVIL—MECHANICAL
REPORTS, DESIGN AND CONSTRUCTION
Complete Railway Shop and Terminal Properties—
Electrification of Steam Railroads.
OUR EXPERIENCE COVERS THIRTY-FIVE PLANTS
Chicago, Illinois.

JACOBS & DAVIES, Inc.
Consulting Engineers

MONTREAL LONDON NEW YORK
Foundations, Subaqueous and Land Tunnels, Subways, Railways, Harbours, Waterpower Development, Examinations, Reports.
Montreal Office: Eastern Townships Bank Building

ANGUS SINCLAIR, C.E.

Railway Contractor

Office: Imperial Bank Building,
King and Sherbourne Sts., Toronto.

Patent Solicitors

VAN-HALLEN & O'NEIL

REGISTERED ATTORNEYS

at Washington and Solicitors of Canadian and Foreign Patents, Copyrights, Trade Marks, Searches.

Head Office, 103 Farmer Building, 333 Main Street,
WINNIPEG, MAN., Canada

ROSS THOMSON & CO.

MECHANICAL AND ELECTRICAL ENGINEERS,
PATENT ATTORNEYS.

Send for free book Patent Protection.

HOPE CHAMBERS - - OTTAWA, ONT.

PATENTS

HERBERT J. S. DENNISON

Mechanical Engineer, Patent Attorney and Expert.
Patents, Trade Marks, Designs, Copyrights, and Infringements. 20 Years experience in Patents and Practical Engineering.

Star Building, 18 King Street West, Toronto
WRITE FOR BOOKLET.

PATENTS SECURED OR OUR FEES RETURNED.

Being next door to the Patent Office; we have personal interviews with Examiners, thus earlier allowance of your Patents. We have access to all Records and solicit the business of Manufacturers, Engineers and others who realize the advisability of having their Patent business transacted by Experts.

HAROLD C. SHIPMAN & CO.

Reg. Patent Attorneys. Ottawa, Canada



Showing the construction of our geared jacks.

**Celebrated
"H & E"
Lifting Jack**

Our Patent Ball-Bearing Geared Jacks are Ideal in Railroad and Heavy Construction Work.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

SHERBROOKE, QUE.

Sole Agents for Brakeshoes for Canada outside of B.C., Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for B.C., The B.C. Equipment Co., Vancouver, B.C. Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.

High Grade Electric
**STEEL CASTINGS
MANGANESE STEEL**

For Crusher Jaws and Heavy Wear Parts

BRONZE

M.C.B. Standard Journal Bearings and Engine Bearings

Improved Reinforced Steel-Backed

BRAKESHOES

Locomotive Driver and Truck Shoes. Freight and Passenger Car and Electric Car Shoes.

ROBERT W. HUNT
THOS. C. IRVING, JR.

CHARLES WARNOCK
JAS. W. MOFFAT

Robert W. Hunt & Co., Limited

Consulting and Inspecting Engineers
Chemists and Metallurgists

Expert examination and tests of all steel and iron products; Bridges, Buildings, Cement; Electrical and Mechanical Plant Equipment; Rails and Fastenings; Cars; Locomotives; Pipe; Lumber; Paving Materials.

Resident inspectors at all important manufacturing centres in Canada, the United States and Great Britain.

REPORTS ON PROPERTIES AND PROCESSES.

Head Office and Laboratories:

McGill Building,

Branches: TORONTO

VANCOUVER

MONTREAL, QUE.

LONDON, ENGLAND

Malleable Iron Castings

Our experience and unexcelled equipment assure you the best service in high class castings.

We also manufacture a full line of malleable cast iron and flanged pipe fittings.

International Malleable Iron Co., Limited
Guelph, Ontario

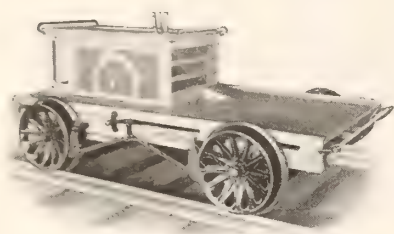
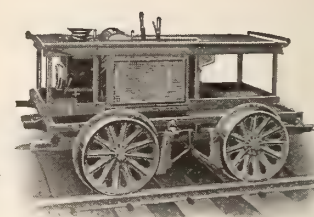
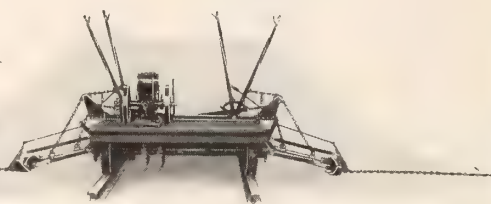
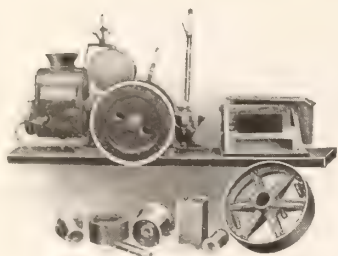
Complete Hydraulic Equipment

For Railway and Shipbuilding Plants

Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc. Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast Iron Pipe, Hydrants, Valves and Fittings, etc

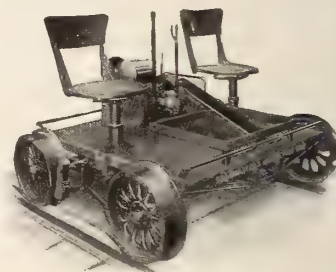
R. D. WOOD & CO. Philadelphia, Pa.

FAIRMONT WINS GOLD MEDAL



The excellence of FAIRMONT Railway Motor Cars is attested by their receiving the highest competitive award, a gold medal, at the Panama-Pacific International Exposition, San Francisco.

Years of good service on Canadian railroads has proven the justice of this award. When you need a motor car, specify "FAIRMONT". Instalment terms to private buyers.



FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

Formerly Fairmont Machine Co.

445 N. MAIN ST., FAIRMONT, MINNESOTA, U.S.A.

KINNEAR

FOR

PIER SHEDS-FREIGHT HOUSES-ROUND HOUSES & SHOPS

STEEL ROLLING DOORS & SHUTTERS
BI-FOLDING & SLIDING DOORS
APPROVED FIRE DOORS

THE KINNEAR MFG. CO.
COLUMBUS, OHIO. U. S. A.

CANADIAN REPRESENTATIVES

EASTERN & CENTRAL
MUSSENS LTD. MONTREAL

BRITISH COLUMBIA
W. N. O'NEIL & CO. VANCOUVER



NICKEL SHOT-HIGH AND LOW CARBON
INGOTS-TWO SIZES, 25-LB., 50-LB.

Electrolytic Nickel-99.80 p.c.

Prime Metals for the manufacture of Nickel Steel, German Silver, Anodes, and all remelting purposes. Our Nickel is produced as rods, sheets, strip stock, wire, and tubes.

MONEL METAL We are Sole Producers of this natural stronger than steel, non-corrodible alloy. Manufactured forms are rods, flats, castings, tubes, sheets, strip stock and wire. Ask for descriptive booklet.

Send Inquiries direct to us.

The International Nickel Company, 43 Exchange Place, New York

It Pays to carry an advertisement in the Canadian Railway and Marine World every issue of the year because you obtain proportionately better **Results**

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies.

ACETYLENE

Commercial Acetylene Ry., Lt. & Sig. Co.

AERATED WATERS

E. L. Drewry

AIR BRAKES AND FITTINGS

Canadian Westinghouse Co.

ALLES

E. L. Drewry

ANGLE BARS

Steel Co. of Canada

AUTOMOBILES

Preston Car & Coach Co.

AXLES

Nova Scotia Steel and Coal Co.

Jas. W. Pyke & Co.

Steel Co. of Canada.

BATTERIES, DRY

Canadian National Carbon Co.

BATTERIES, SIGNAL

Canadian National Carbon Co.

BATTERIES, STORAGE

Canadian National Carbon Co.

BATTERIES, TRACK

Canadian National Carbon Co.

BATTERY SUPPLIES

Canadian National Carbon Co.

BEACONS

Safety Car Htg. & Ltg. Co.

BOILER COMPOUND

Dearborn Chemical Co. of Canada

BOILERS

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

BOILERS, PORTABLE

F. H. Hopkins & Co.

Polson Iron Works

BOILERS, STATIONARY AND MARINE

Polson Iron Works

BOILERS, STEAM

Polson Iron Works

BOILERS, WATER TUBE

Babcock & Wilcox

Polson Iron Works

BOLTS AND NUTS

Steel Co. of Canada

BOLTS, TRACK

F. H. Hopkins & Co.

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

BORERS, CAR WHEEL

John Bertram & Sons Co.

BRAKE BEAMS

Buffalo Brake Beam Co.

BRAKE SHOES

Canadian Brakeshoe Co.

Dominion Brakeshoe Co.

BRIDGE NUMBERS

Acton Burrows, Limited

BRIDGES

Canadian Bridge Co.

Dominion Bridge Co.

BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION

Canadian National Carbon Co.

BUCKETS, COAL, ORE AND CONCRETE

M. Beatty & Sons

Brown Hoisting Machinery Co.

F. H. Hopkins & Co.

BUILDINGS, STEEL

Canadian Bridge Co.

Dominion Bridge Co.

BUMPING POSTS

F. H. Hopkins & Co.

CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED

Standard Und. Cable Co. of Can.

CARBONS, ARC LAMP, FLARE ARC AND PHOTOGRAPHIC

Canadian National Carbon Co.

CARBON SPECIALTIES

Canadian National Carbon Co.

CAR SIGNAL SYSTEMS

Ohio Brass Co.

CASTINGS

Crossen Car Co.

CASTINGS, BRASS

Canadian Bronze, Limited

CARS

Crossen Car Co.

J. T. Gardner

Hart-Otis Car Co.

National Steel Car Co.

Ottawa Car Mfg. Co.

Preston Car & Coach Co.

CASTINGS, CAR

Dominion Brakeshoe Co.

CASTINGS, IRON

Hunt-Spiller Manufacturing Corp.

CASTINGS, IRON AND STEEL

Dominion Brakeshoe Co.

Dominion Steel Foundry Co.

CASTINGS, MALLEABLE

International Mall. Iron Co.

Taylor & Arnold

CASTINGS, MANGANESE STEEL

Canadian Steel Foundries, Ltd.

CASTINGS, STEEL

Dominion Steel Foundry

CATENARY MATERIALS

Ohio Brass Co.

CHAINS

B. J. Coghlin Co.

F. H. Hopkins & Co.

CLOSETS, CAR

Duner Co.

COAL

Nova Scotia Steel and Coal Co.

COMPRESSORS, AIR

F. H. Hopkins & Co.

CONCRETE MIXERS & ROCK CRUSHERS

F. H. Hopkins & Co.

CONTRACTORS' SUPPLIES

F. H. Hopkins & Co.

Rice, Lewis & Sons

CONVEYORS, COAL AND ASH

Babcock & Wilcox

COPPER, RODS AND WIRE

Standard Und. Cable Co. of Can.

COUPLERS, CAR & LOCOMOTIVE

Canadian Steel Foundries, Ltd.

Ohio Brass Co.

Taylor & Arnold

CRANES

Brown Hoisting Machinery Co.

Coles, Henry J.

F. H. Hopkins & Co.

CRANES, WRECKING

Coles, Henry J.

F. H. Hopkins & Co.

CRANES, ELECTRIC

Babcock & Wilcox

Coles, Henry J.

Dominion Bridge Co.

F. H. Hopkins & Co.

CRANES, TRAVELLING

Coles, Henry J.

F. H. Hopkins & Co.

CROWBARS

B. J. Coghlin Co.

CULVERTS

Pedlar People, Ltd.

CURTAINS AND FIXTURES, CAR

Du Pont Fabrikoid Co.

Preston Car & Coach Co.

CUTS

Acton Burrows, Limited

DERRICKS

M. Beatty & Sons

F. H. Hopkins & Co.

DIES

Butterfield & Co.

DITCHERS

M. Beatty & Sons

F. H. Hopkins & Co.

DIVING OUTFITS

John Date

F. H. Hopkins & Co.

DOORS, STEEL ROLLING

Kinnear Manufacturing Co.

DOOR SIGNS

Acton Burrows, Limited

DRAFT GEAR

Standard Coupler Co.

DREDGES

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

DRIERS

John Morrow Screw & Nut Co.

DRILLS, AIR

F. H. Hopkins & Co.

Independent Pneumatic Tool Co.

DRILLS, WELL

F. H. Hopkins & Co.

DUMP CARS, CONTRACTORS'

Hart-Otis Can. Co.

F. H. Hopkins & Co.

DYNAMO AND ELECTRIC CASTINGS

Dominion Brakeshoe Co.

ECONOMIZERS

Babcock & Wilcox

ELECTRIC CAR ROUTE SIGNS

Acton Burrows, Limited

Preston Car & Coach Co.

ENAMELED IRON SIGNS

Acton Burrows, Limited

ENGINES, AUTOMATIC

Polson Iron Works

ENGINES, HOISTING

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

ENGINES, STATIONARY AND MARINE

Polson Iron Works

ENGINES, STEAM

F. H. Hopkins & Co.

EXPRESS OFFICE SIGNS

Acton Burrows, Limited

FARE BOX HOLDERS

Coleman Fare Box Co.

FARE BOXES, P.A.Y.E. OPERATION

Coleman Fare Box Co.

FARE BOXES, PORTABLE AND STATIONARY

Coleman Fare Box Co.

FILES

Nicholson File Co.

FORGINGS

Champion Machine & Fdry. Co.

Crossen Car Co.

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

FURNACES, OIL AND GAS

Railway Materials Co.

GAUGE COCKS

Ohio Brass Co.

GAUGES, LOCOMOTIVE

Taylor & Arnold

GRATES, SHAKING

Babcock & Wilcox

Polson Iron Works

HAMMERS, CAST STEEL

Dominion Brakeshoe Co.

HANDCARS

F. H. Hopkins & Co.

Crossen Car Co.

F. H. Hopkins & Co.

Rice, Lewis & Sons

HANGERS, CABLE

Standard Und. Cable Co. of Can.

HEADLIGHTS

Commercial Acetylene Ry. Lt. and Sig. Co.

Safety Car Htg. & Ltg. Co.

HEADLININGS

Crossen Car Co.

HEATING, CAR

Chicago Car Heating Co.

Consolidated Car Heating Co.

Safety Car Htg. & Ltg. Co.

HOISTS, PNEUMATIC

Taylor & Arnold

HOISTS, STEAM

M. Beatty & Sons

HOOKS

Steel Co. of Canada

HOPPERS, CAR, WET OR DRY

Duner Co.

HOSE, AIR BRAKE AND STEAM

Safety Car Htg. & Ltg. Co.

ILLUSTRATIONS

Acton Burrows, Limited

INSPECTIONS

R. W. Hunt & Co.

INSULATORS, PORCELAIN

Ohio Brass Co.

INSURANCE, ACCIDENT

Imperial Guar. & Acc. Ins. Co.

INTERLOCKING PLANT AND SIGNALS

Canadian Steel Foundries, Ltd.

Gen. Railway Signal Co. of Can.

IRON AND STEEL BARS

Steel Co. of Canada

IRON, PIG

Nova Scotia Steel and Coal Co.

Steel Co. of Can.

IRON SIGNS

Acton Burrows, Limited

JACKS

Canadian Brakeshoe Co.

Flange Lubrication Should be Automatic

Flange lubrication to be efficient should be automatic, absolutely independent of your engineer, and at the same time the device itself should be so simple and yet so accurate that it will be practically trouble proof. The

Detroit Automatic Flange Lubricator (Pendulum Type)

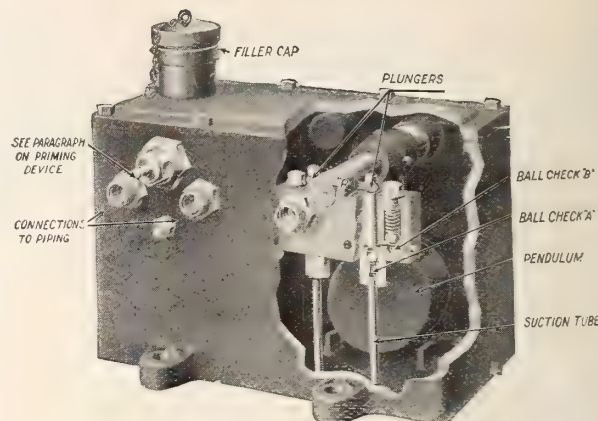
is absolutely automatic and at the same time simple. It is all in the pendulum. Any lateral movement of the locomotive causes the pendulum to swing. This oscillation rotates, rocker-like, the pendulum shaft, which produces alternating strokes of the two plungers in the pumping unit.

The use of the Detroit Automatic Flange Lubricator insures positive lubrication just when it is needed. May we send booklet F-O 81? It contains all the facts as well as drawings. Write to-day.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.

WALKERVILLE, ONT.

Canadian Sales Agents: Taylor & Arnold, Ltd., Montreal.



The Canadian Bridge Co., Limited

Walkerville, Ontario

Locomotive
Turntables
Roofs
Steel Buildings

Manufacturers of

Railway and Highway
BRIDGES

Structural
Iron Work
of all
Descriptions

RAILWAY EXCHANGE

CHICAGO

FERGUSON SHOP FURNACES
MANUFACTURED IN CANADA
THE RAILWAY MATERIALS CO.

SINGER BUILDING

NEW YORK

CHICAGO CAR HEATING CO.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES

Canadian Factory and Office—61 Dalhousie St., Montreal

GENERAL OFFICES:
RAILWAY EXCHANGE, CHICAGO, U.S.A.
NEW YORK, GRAND CENTRAL TERMINAL BLDG.
ATLANTA GA., CANDLER BLDG.
WASHINGTON, D.C., MUNSEY BLDG.

A. D. BRUCE, Agent

C. W. Sherman, Pres. and Gen. Mgr.

F. W. Baillie, Vice-Pres.

J. E. Hammond, Secy.-Treas.

Dominion Steel Foundry Company, Limited, Hamilton, Ont.

Locomotive Frames

Car Bolsters

Car Castings

Heavy Machinery Castings

J. S. COFFIN
President

SAMUEL G. ALLEN
1st Vice-President

W. H. COYLE
2nd Vice-President

C. L. WINEY
Sec'y. and Treas.

FRANKLIN RAILWAY SUPPLY COMPANY

Specialists—In Devices That Make for Economy

MAIN OFFICE, 30 CHURCH ST., NEW YORK

CHICAGO OFFICE: 332 South Michigan Ave.

MONTREAL OFFICE: 625 Transportation Bldg.

SAN FRANCISCO OFFICE: 795 Monadnock Bldg.

MILEPOST NUMBERS

Acton Burrows, Limited

MONEL METAL

International Nickel Co.

MOTOR CARS

Fairmont Gas. Eng. and Ry.

Motor Car Co.

MOTORS, TURNTABLE

Taylor & Arnold

NAILS, CUT AND WIRE

Steel Co. of Canada

NICKEL, SHEET, ROD, WIRE & TUBE

International Nickel Co.

NICKEL, METALLIC SHOT & INGOTS

International Nickel Co.

NUMBERS

Acton Burrows, Limited

NUT LOCKS

Positive Lock Washer Co.

OFFICE FITTINGS

Can. Office & School Furn. Co.

OFFICE SIGNS

Acton Burrows, Limited

OILS

Galena-Signal Oil Co.

PACKING

Garlock Packing Co.

PILE DRIVERS, RAILWAY

F. H. Hopkins & Co.

PIPE, STEAM

Babcock & Wilcox

PIPE STOCKS

Butterfield & Co.

PIPE, WROUGHT, LEAD AND GALVANIZED

Steel Co. of Canada

PLANERS

John Bertram & Sons Co.

PLATFORMS, STEEL

Standard Coupler Co.

PLOUGHS, CONTRACTORS'

F. H. Hopkins & Co.

PORTER

E. L. Drewry

PUMPS

F. H. Hopkins & Co.

PUMPS, CENTRIFUGAL

M. Beatty & Sons

F. H. Hopkins & Co.

PUNCHES AND SHEARS

Long & Allstatter Co.

PUTTY

Steel Co. of Canada

RAIL BONDS

Ohio Brass Co.

Elec. Railway Improvement Co.

RAIL BENDERS

Canadian Steel Foundries, Ltd.

RAIL JOINTS

Goldschmidt Thermit Co.

The Rail Joint Co. of Canada

RAILS, NEW

Algoma Steel Corporation

Dominion Iron & Steel Co.

J. T. Gardner

J. J. Gartshore

F. H. Hopkins & Co.

RAILS FOR RELAYING

J. J. Gartshore

Jas. W. Pyke & Co.

RAILWAY SUPPLIES

Franklin Railway Supply Co.

F. H. Hopkins & Co.

Rice, Lewis & Sons

The Hiram L. Piper Co.

REAMERS

Butterfield & Co.

REPLACERS, CAR AND LOCOMOTIVE

F. H. Hopkins & Co.

RIVETS

Steel Co. of Canada, Ltd.

ROCK CRUSHERS

F. H. Hopkins & Co.

ROPES, DERRICK

Dominion Wire Rope Co.

ROOFING, CAR

Franklin Railway Supply Co.

F. H. Hopkins & Co.

RUBBER GOODS

Can. Consolidated Rubber Co.

SANDERS, PNEUMATIC

Ohio Brass Co.

SAWS, HACK

Diamond Saw & Stamping Co.

SCOWS, DUMP AND DECK

M. Beatty & Sons

SCREW PLATES

Butterfield & Co.

SCRAPERS, WHEEL AND DRAG

F. H. Hopkins & Co.

SCREWS, WOOD AND MACHINE

John Morrow Screw and Nut Co.

Steel Co. of Canada

SEMAPHORE ARMS

Acton Burrows, Limited

SHIPS

Polson Iron Works

SIGNAL HOUSE NUMBERS

Acton Burrows, Limited

SIGNALS

Gen. Railway Signal Co. of Can.

The Hiram L. Piper Co.

SIGNS

Acton Burrows, Limited

SKYLIGHTS

Kinnear Manufacturing Co.

SNOW PLOUGHS

Crosen Car Co.

F. H. Hopkins & Co.

SPIKES, RAILWAY, SHIP OR PRESSED

Nova Scotia Steel and Coal Co.

Steel Co. of Canada

SPICING TUBES AND COMPOUNDS

Standard Und. Cable Co. of Can.

SPREADER CARS

F. H. Hopkins & Co.

SPRINGS

Canadian Steel Foundries, Ltd.

B. J. Coghlin & Co.

SPRINKLERS, ELECTRIC

Preston Car & Coach Co.

STAPLES

Steel Co. of Canada

STATION NAME SIGNS

Acton Burrows, Limited

STAYBOLT IRON

Taylor & Arnold

STAYBOLTS, FLEXIBLE

Flannery Bolt Co.

STAYBOLTS, LOCOMOTIVE

Flannery Bolt Co.

STAYBOLT TAPS

Butterfield & Co.

STEAM HAMMERS

John Bertram & Sons Co.

STEAM SHOVELS

M. Beatty & Sons

F. H. Hopkins & Co.

STEAMSHIP SIGNS

Acton Burrows, Limited

STEAM TRAPS

Safety Car Htg. & Ltg. Co.

STEEL

F. H. Hopkins & Co.

Nova Scotia Steel and Coal Co.

STEEL, FIRE BOX

Taylor & Arnold

Canadian Steel Foundries, Ltd.

STEEL FOR AXES

Canadian Steel Foundries, Ltd.

STEEL FOR SAWS

Canadian Steel Foundries, Ltd.

STEEL FOR TIRES

Steel Co. of Canada

STEEL SHAFTING

Nova Scotia Steel and Coal Co.

STEEL PLATES

Jas. W. Pyke & Co.

STEEL, TOOL

Canadian Steel Foundries, Ltd.

F. H. Hopkins & Co.

STOKERS, MECHANICAL

Babcock & Wilcox

STRAINERS

Babcock & Wilcox

SUPERHEATERS

Locomotive Superheater Co.

SWITCH TARGETS

Acton Burrows, Limited

TACKS

Steel Co. of Canada

TANKS AND TANK FIXTURES

F. H. Hopkins & Co.

Polson Iron Works

TANKS, PORTABLE ACETYLENE, WELDING

Commercial Acetylene Ry. Lt. and Sig. Co.

TAPS

Butterfield & Co.

TELEGRAPH AND TELEPHONE OFFICE SIGNS

Acton Burrows, Limited

TERMINALS, JUNCTION BOXES

Standard Und. Cable Co. of Can.

THERMIT

Goldschmidt Thermit Co.

TIE PLATES

Algoma Steel Corporation

B. J. Coghlin

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

TICKET CASES

Canadian Office & School Fur. Co.

TIRES, STEEL

Jas. W. Pyke & Co.

TOOLS AND SUPPLIES

F. H. Hopkins & Co.

Pratt & Whitney Co.

TOOLS, CAST STEEL

Dominion Brakeshoe Co.

TOOLS, TRACK

John Bertram & Sons Co.

Canadian Steel Foundries, Ltd.

B. J. Coghlin Co.

F. H. Hopkins & Co.

TOOLS, PNEUMATIC

Independent Pneumatic Tool Co.

TRAMWAY EQUIPMENT

J. J. Gartshore

F. H. Hopkins & Co.

TRUCK EQUIPMENT

F. H. Hopkins & Co.

TROLLEY BASES

Ohio Brass Co.

TROLLEY GUARDS

Ohio Brass Co.

TROLLEY RETRIEVERS

Ohio Brass Co.

TRUCKS, ELECTRIC CAR

Canadian Steel Foundries, Ltd.

TRUSSES, ROOF

Canadian Bridge Co.

Dominion Bridge Co.

TUBES, BOILER

F. H. Hopkins & Co.

TUBE CLEANERS

F. H. Hopkins & Co.

TURNBUCKLES

Canadian Steel Foundries, Ltd.

TURNTABLES

Canadian Bridge Co.

Dominion Bridge Co.

UPHOLSTERY, CAR

Du Pont Fabrikoid Co.

VALVES

Canadian Detroit Lubricator Co.

R. D. Wood & Co.

VALVES, ANGLE AND GLOBE

Ohio Brass Co.

VALVES, BRASS GATE

Ohio Brass Co.

VALVES, LOCOMOTIVE POP

Taylor & Arnold

VARNISHES

Berry Bros.

VENTILATORS, CAR

Automatic Ventilator Co.

VESSELS

Polson Iron Works

WASHERS

Steel Co. of Canada

WASTE

B. J. Coghlin Co.

WATER SOFTENERS & PURIFIERS

Babcock & Wilcox

Dearborn Chemical Co. of Can.

WELDING

Goldschmidt Thermit Co.

WHEELBARROWS

F. H. Hopkins & Co.

WHEEL GRINDERS

Griffin and Brinkerhoff

WHEELS, CAR

Jas. W. Pyke & Co.

WHITE LEAD

Steel Co. of Canada

WIRE AND WIRE ROPE

Dominion Wire Rope Co.

WIRE, BARE COPPER

Standard Und. Cable Co. of Can.

Steel Co. of Canada

WIRE, BRASS, IRON AND STEEL

Steel Co. of Canada

WIRE, INSULATED COPPER

Standard Und. Cable Co. of Can.

Steel Co. of Canada

WIRE GOODS, BRIGHT

Steel Co. of Canada

WIRE, TELEGRAPH AND TELEPHONE

Standard Und. Cable Co. of Can.

Steel Co. of Canada

WIRE, TRANSMISSION AND TROLLEY

Standard Und. Cable Co. of Can.

WRENCHES, CAST STEEL

Dominion Brakeshoe Co.

YACHTS

Polson Iron Works

The Ottawa Car Manufacturing Co., Limited

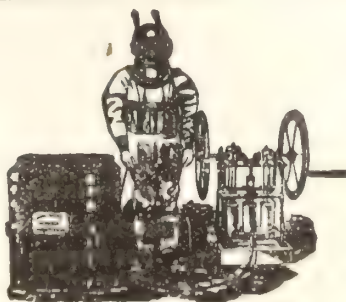
Builders of

Electric Cars, Snow Sweepers and Plows

Also

Producers of Brass Castings of Every Description.

Slater Street - Ottawa



JOHN DATE

Manufacturer of

Diving Apparatus

For Sale or Hire

Brass Founder and Coppersmith
13-15 Concord St., Montreal

The Preston Car & Coach Co., Limited

Preston, Ont.

Manufacturers of

Steam and Electric Railway Cars and Special Cars.

Alphabetical List of Advertisers

A		D		M	
Algoma Steel Corporation	22	Date, John	81	Montreal Locomotive Works	2
Arnold Co.	77	Dearborn Chemical Co. of Canada	15	Morrow, John, Screw & Nut Co..	20
Automatic Ventilator Co.	73	Dennis Hotel	126		
B		Dennison, H. J. S.	77	N	
Babcock & Wilcox	25	Diamond Saw & Stamping Works	74	National Steel Car Co.	84
Beatty, M. & Sons, Co.	75	Dominion Brakeshoe Co.	24	Nicholson File Co.	11
Berry Bros.	12	Dominion Bridge Co.	75	Norton, A. O., Inc.	12
Bertram, John & Sons, Co.	1	Dominion Iron & Steel Co.	21	North American Life Ins. Co....	19
Bradstreet Company	76			Northern Electric Co.	20
Brown Hoisting Machinery Co...	7			Nova Scotia Steel & Coal Co....	17
Buffalo Brake Beam Co.	24				
Burrows—Acton Burrows, Ltd...	20			O	
Butterfield & Co.	76			Ohio Brass Co.	9
C				Ottawa Car Manufacturing Co...	81
Canadian Brakeshoe Co.	77				
Canadian Bridge Co.	80			P	
Canadian Bronze, Ltd.	20			Pedlar People, Ltd.	15
Canadian Consolidated Rubber Co.	26			Piper, The Hiram L., Co.	74
Canadian Detroit Lubricator Co...	80			Polson Iron Works	18
Canadian Government Railways...	25			Positive Lock Washer Co.	76
Canadian Locomotive Co.	18			Pratt & Whitney Co. of Canada..1 & 73	
Canadian Marconi Co.	74			Preston Car & Coach Co....	81
Canadian National Carbon Co. ..	21			Pyke, J. W. & Co.	23
Canadian Northern Railway	10				
Canadian Office & School Furni- ture Co.	19			R	
Canadian Pacific Railway	16			Rail Joint Co. of Canada	83
Canadian Steel Foundries, Ltd...	17			Railway Materials Co.	80
Canadian Westinghouse Co.	2			Roberts & Schaefer Co.	72
Champion Machine & Forging Co.	22				
Chicago Car Heating Co.	80			S	
Coghlin, B. J., Co.	23			Safety Car Heating & Light. Co.	13
Commercial Acetylene Ry., Light & Signal Co.	23			Shipman, Harold C., & Co....	77
Consolidated Car Heating Co....	76			Sinclair, Angus	77
Crossen Car Co.	16			Standard Coupler Co.	71
				Standard Underground Cable Co. of Canada	75
				Steel Co. of Canada	4
				T	
				Taylor & Arnold	24
				Terry & Tench Co.	77
				Thomson, Ross & Co.	77
				V	
				Van-Hallen & O'Neil	77
				W	
				Wood, R. D., & Co....	77
				*Advertisements marked with an asterisk appear in alternate issues.	
E					
Electric Railway Improvement Co.	21				
F					
Fairmont Gas Engine & Ry. Mo- tor Car Co.	78				
Flannery Bolt Co.	14				
Franklin Railway Supply Co.	80				
G					
Galena-Signal Oil Co.	3				
Garlock Packing Co.	10				
Gartshore, J. J.	75				
General Ry. Signal Co. of Canada	5				
Goldschmidt Thermit Co.	14				
Grand Trunk Railway	13				
Griffin and Brinkerhoff.....	19				
H					
Hart-Otis Car Co.	9				
Hopkins, F. H. & Co.	8				
Hunt, Robert W. & Co.	77				
Hunt-Spiller Mfg. Corporation...	76				
I					
Imperial Bank of Canada.....	76				
*Imperial Guar. & Acc. Ins. Co...	—				
Independent Pneumatic Tool Co..	25				
International Correspond. Schools	19				
International Malleable Iron Co...	77				
International Nickel Co.	78				
J					
Jacobs & Davies	77				
K					
Kinnear Manufacturing Co.	79				
L					
Lewis, Rice & Son	82				
Locomotive Superheater Co.	22				
Long & Allstatter Co.	11				

The Parmelee Pipe Wrench



Price List C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	¾, ½, ¾, 1 in.	\$5.00	\$2.25	¾, ½, ¾, 1 in. \$.75
20 in.	2½	¾, 1, 1¼, 1½, 2 in.	7.50	2.50	¾, 1, 1¼ in. 1.00 1½, 2 in. 1.25
25 in.	3½	1½, 2, 2½, 3 in.	7.50	3.00	1½, 2, 2½, 3 in. 1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Limited
Toronto, Canada

"The Toothless Wonder"

Designed Especially to handle pipes spaced closely as in coil work. No. 2½ wrench illustrated requires but three-quarter inch space between pipes.

Positive Grip instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

Ratchet-like Action. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

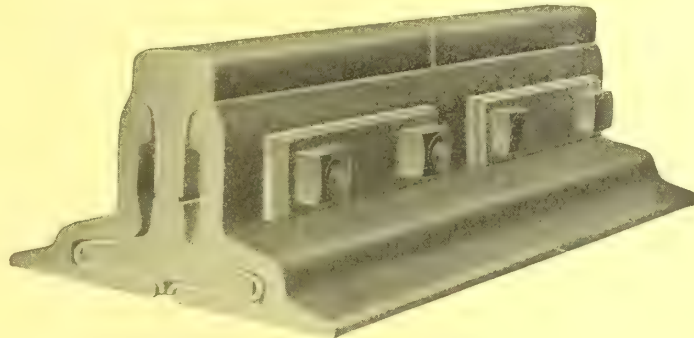
Can't Chew. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

Can't Crush. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.

The Rail Joint Company of Canada Limited

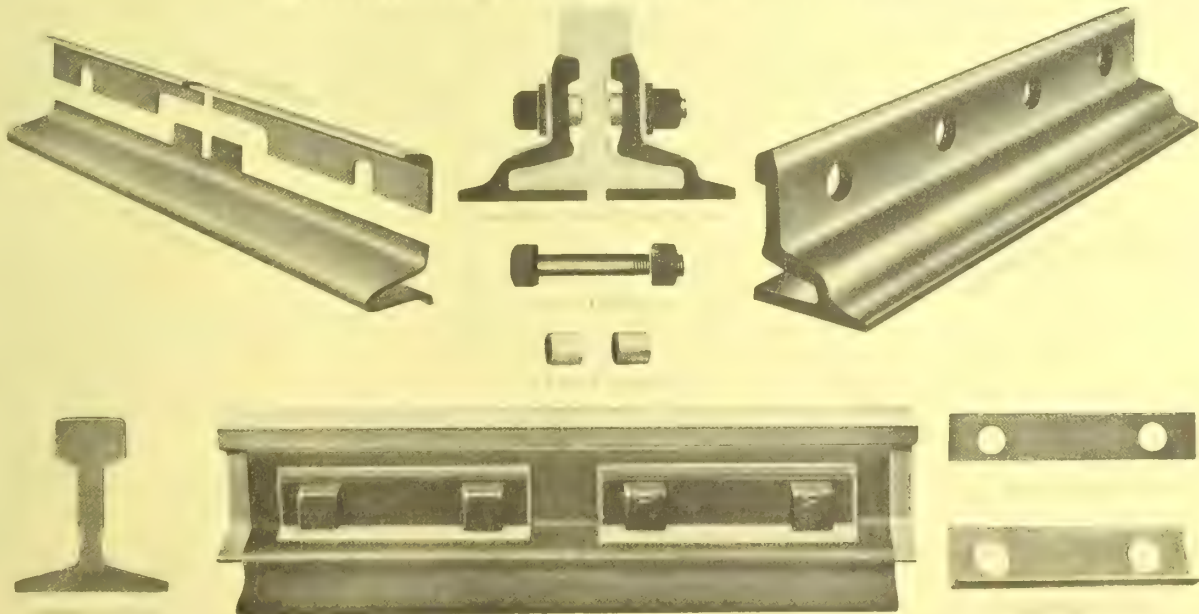
606 McGill Bldg., MONTREAL, CANADA

Makers of Base-Supported and One Hundred Per Cent. Rail Joints for Standard, Girder, and Special Rail Sections. Also Joints for Frogs and Switches; Insulated Rail Joints, and Step or Compromise Rail Joints. Patented in Canada and the United States. Catalogue on Request.



CONTINUOUS INSULATED JOINT AND

CONTINUOUS INSULATED JOINT PARTS



Agencies:

Boston, Mass., India Bldg.; Chicago, Ill., Railway Exchange Bldg.; Denver, Colo., Equitable Bldg.; New York City, N. Y., 185 Madison Ave.; Philadelphia, Pa., Pennsylvania Bldg.; Pittsburg, Pa., Oliver Bldg.; Portland, Ore., Wilcox Bldg.; St. Louis, Mo., Commonwealth Trust Bldg.; Troy, N. Y., Burden Ave.;

London, E. C., Eng., 36 New Broad Street.



Motorize Your Hauling With NATIONAL Worm Drive Trucks

One of the four NATIONAL Models will meet your requirements for hauling and delivery purposes up to three-and-a-half tons capacity.

The superiority of the design, materials and workmanship in the NATIONAL MOTOR TRUCKS is acknowledged by competent engineers to have set a new standard for Motor Trucks in Canada.

The NATIONAL MOTOR TRUCK is built to give every-day-year 'round service to Canadian business houses. Actual conditions have been fully taken into consideration by our Engineering Department through a thorough study of load capacities required, condition of streets and roads, length of haul and continuity of service.

The Truck as a method of transportation is acknowledged to be the most economical means of hauling that can be employed. NATIONAL TRUCKS are in daily use giving splendid service, and cutting the cost of deliveries. Why not investigate? A copy of the NATIONAL TRUCK Catalogue is yours for the asking. Mention the nature of your business, capacity required, and average length of haul when writing.

National Steel Car Company, Limited

Operating Offices and Works : HAMILTON, CANADA

Montreal Office,
Shaughnessy Building

Foreign Offices,
London, Eng. Paris, France. Petrograd

Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 218

TORONTO, CANADA, APRIL, 1916

Subscription Rates, Page 147

Railway

Track

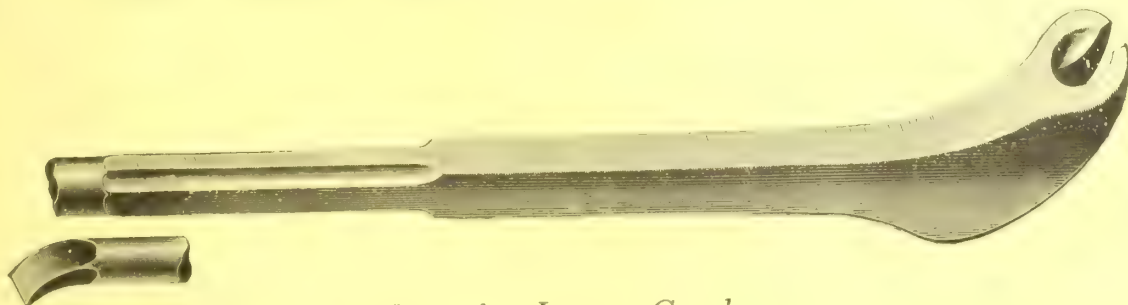


Tools

"Made In Canada"



We offer you the "BEST" Tools in Material, Design and Workmanship, with a Canadian Guarantee and can ship your requirements from stock, the day the order is received.



Write for Latest Catalogue.

B. J. COGHLIN CO., Limited

Office and Works, Ontario Street East, MONTREAL

Westinghouse Small, Direct-Current Turbo-Generators For Marine Lighting

This unit will supply current for forty 25-Watt Lamps.

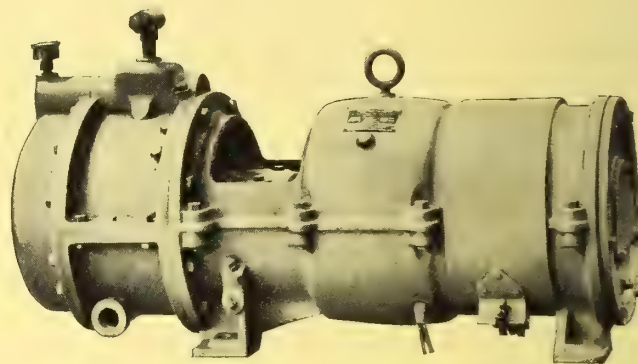
Hard service has proven beyond a doubt the reliability of these lighting sets.

They will operate satisfactorily on compressed air.

Practically no attention is needed when running.

Full rating may be developed on 75 pounds, and pressures up to 200 pounds may be developed.

An idea of their compactness may be had from the dimensions given beneath the picture.



Westinghouse 120 Volt, Direct Current Unit
Length 35", Width 14", Height 17"; Weight 400 lbs.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

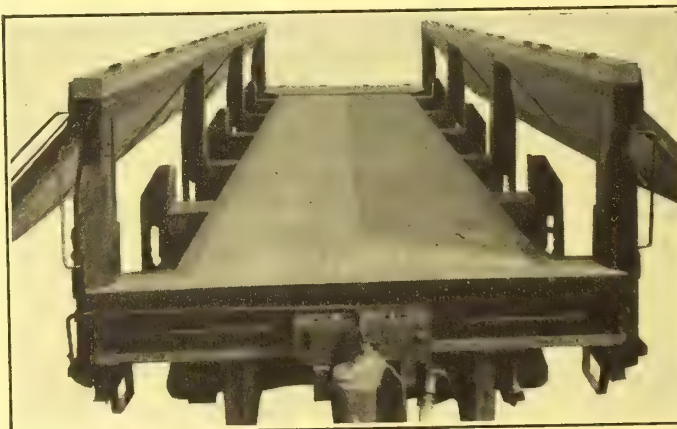
TORONTO, Traders Bank Bldg. MONTREAL, 52 Victoria Sq. OTTAWA, Ahearn & Soper, Ltd. HALIFAX, 105 Hollis St. FT. WILLIAM, Telfer Bldg.
WINNIPEG, 158 Portage Ave. E. CALGARY, Grain Exchange Bldg. EDMONTON, Dominion Bldg. VANCOUVER, Bank of Ottawa Bldg.

Side Ballasting With One Side Closed The Latest in Ballast Cars

33 $\frac{1}{3}$ % More Door
Opening Area

Less Stakes to
Obstruct the
Dumping Material

No clogging of the
Material or Boulders
Between the Plow
and Stakes



Dumps Clean and
Quicker in Any
Material

No More Breaking
of Stakes or Cables

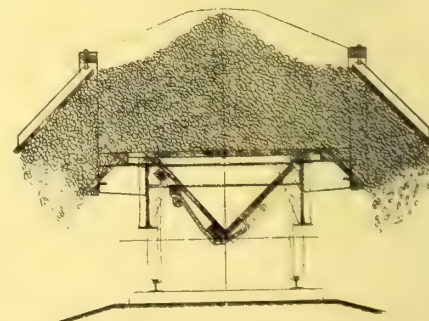
The Car That Will
Give Maximum
Service With
Minimum Repairs

The Pockets At Each Side Allow
the Material to Get Away Relieving
the Car Side and Stakes of Strain.

ACTUAL SERVICE HAS PROVEN ITS EFFICIENCY
LET US SHOW YOU THIS CAR

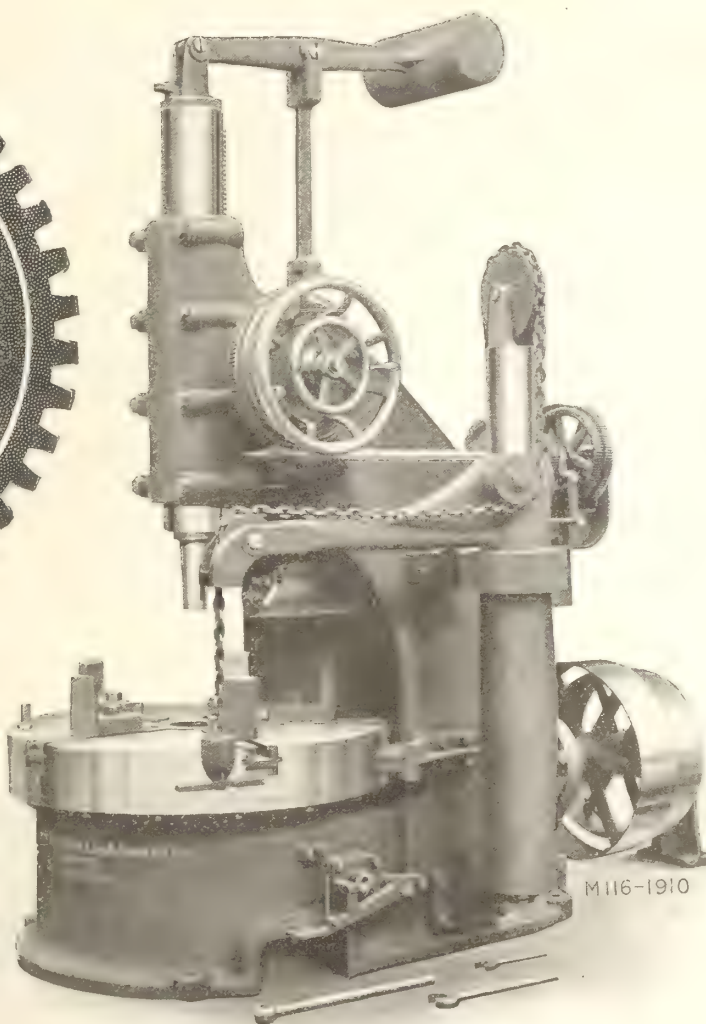
DESIGNED, BUILT, AND PATENTED IN CANADA

The HART-OTIS CAR CO. Limited, MONTREAL





42-inch Car Wheel Borer



Equipped with Air Crane for Wheels,

We Manufacture a Full Line of Locomotive and Car Shop Machinery

Write us about the machine or machines in which
you are interested—we gladly send photographs
and full specifications.

The John Bertram & Sons Co., Limited

DUNDAS, ONTARIO, CANADA

MONTREAL
723 Drummond Bldg.

VANCOUVER
609 Bank of Ottawa Bldg.

WINNIPEG
1205 McArthur Bldg.



The Steel Company of Canada, Limited

HAMILTON, CANADA

Special Steel Marine Forgings

When forgings are required to stand the strain of rough weather, and to prove themselves reliable and dependable, write us for particulars and prices.

We have the facilities for the production of heavy steel forgings of all kinds, including:

Connecting Rods
Crank Shafts
Eccentric or
Cam Forgings
Marine Engine
Forgings
Piston Heads
Piston Rods
Shafting



Stern Frame of Steamship Hamonic

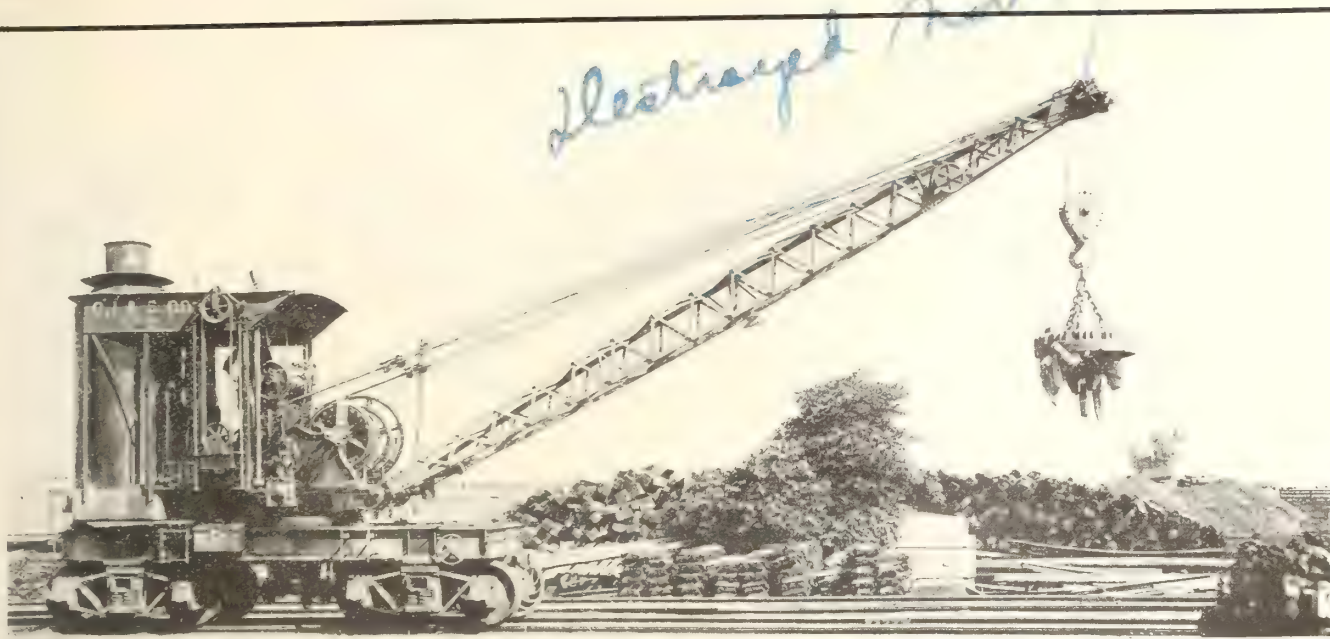
Rounds
Squares
Rudder Frames
Stern Frames
Side Rods
Steam Engine
Forgings

District Sales Offices:

HAMILTON MONTREAL TORONTO WINNIPEG

W. A. MacLennan, Vancouver, B.C.
J. B. H. Rickaby, Victoria, B.C.

H. G. Rogers, St. John, N.B.
Geo. D. Hatfield, Halifax, N.S.



Why employ 20 to 40 men to handle your material? A

BROWNHOIST Locomotive Crane

will do the same amount of work with a decided saving to you. Its cost, including 6% interest on investment, depreciation, and operating costs, is only \$6.00 to \$10.00 per day. It is one man operated, powerful, quick-acting, and built to withstand hard and continuous service. Records prove this.

Adaptability. The equipment is interchangeable. It only takes a short time to apply the Grab Bucket, Bottom Block, Drag-Line Bucket, Pile Driving Attachment, Lifting Magnet, or Shovel Equipment. This makes practically six machines in one.

Railroads all over the country are realizing more and more the advantage and economy of having a Brownhoist Locomotive Crane on the job, because it is always ready to work in case of emergency. A Brownhoist Crane can be relied upon. One road uses thirty of them.

*INVESTIGATE TO-DAY. Catalogue I shows how
and where some of these cranes are used.*

The Brown Hoisting Machinery Co.

CLEVELAND, OHIO

MONTREAL OFFICE, 145 St. James Street

GALENA OILS

HAVE NO EQUAL IN
QUALITY, EFFICIENCY and ECONOMY

SOLE MANUFACTURERS OF
Celebrated Galena Coach, Engine and Car Oils
LUBRICATION ON A GUARANTEED BASIS

ELECTRIC RAILWAY LUBRICATION
A SPECIALTY

Perfection Valve and Signal Oils

Galena Railway Safety Oil—Made especially for use in headlights, marker and classification lamps.

Galena Long Time Burner Oil—For use in switch and semaphore lamps, and all lamps for long time burning, avoiding smoked and cracked chimneys and crusted wicks.

TESTS AND CORRESPONDENCE SOLICITED

Galena Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.



Railroad
Switch Ropes,
Wrecking Cables,
Ballast Cables,
Crane Cables

The Dominion Wire Rope Company, Limited, Montreal
St. Catharines and Winnipeg

Immediate Shipment from
Warehouse Stock of

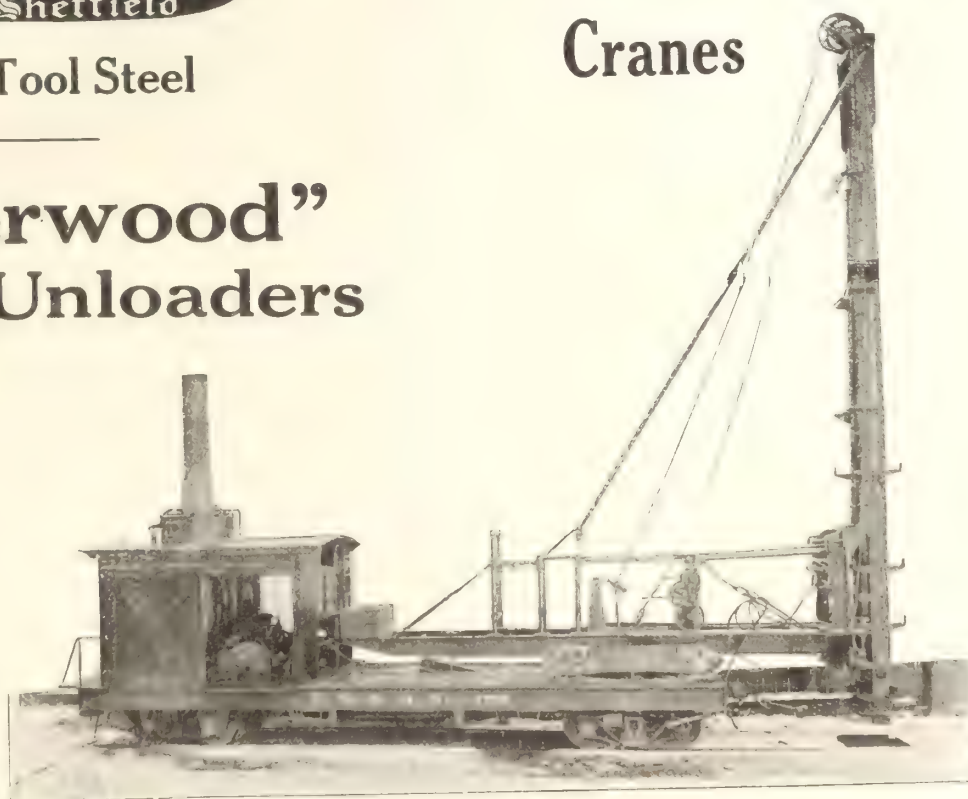
Andrews **"Toledo"**
Sheffield

Drill and Tool Steel

"Lidgerwood"
Ballast Unloaders

"Jordan"
Spreaders.

"Marion"
Steam Shovels
Ballast Plows
R.R. Ditchers



"Industrial"
Pile Drivers

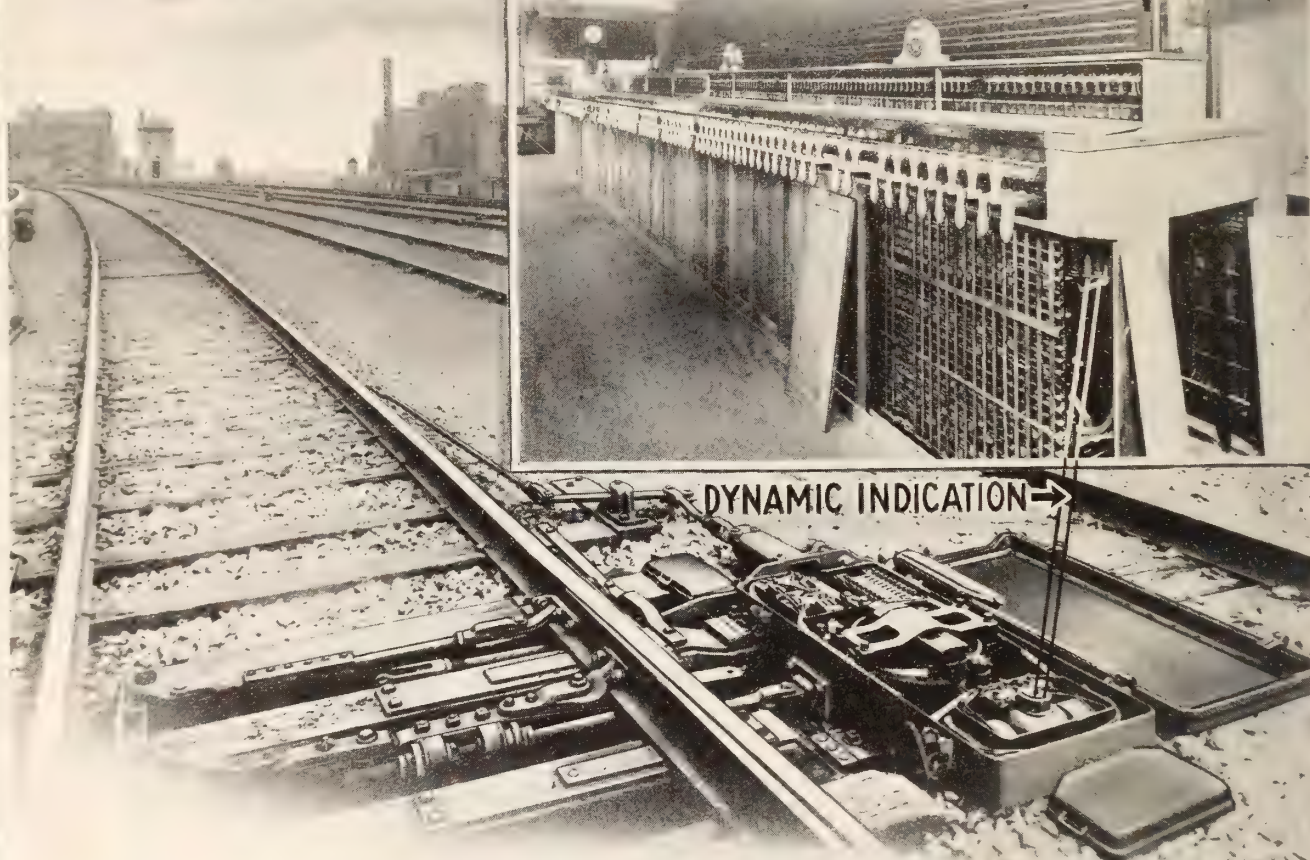
Locomotive and Wrecking
Cranes

Branch :
St. Catharines, Ont.

F.H.Hopkins & Co

Head Office :
MONTREAL

Why Dynamic Indication is the always-safe principle in G R S Electric Interlocking



The fundamental safety first principle of **G R S Electric Interlocking Dynamic Indication** remains as it was invented 13 years ago. This test of years is the most convincing evidence in the unfailing integrity of Dynamic Indication.

This indication is not secured from energy existent at the function prior to the movement of that function and dependent only on closing of a single break in the indication circuit, as is the case in A. C. and battery indication systems; but being a dynamic current generated by the momentum of the motor, **it can be secured only after actual operation of the function.** Since it is impossible to obtain an indication upon the lever controlling the function in any other way than by this generated current pro-

duced by the motor after the completed movement of the function, this system is **always safe.** Furthermore, dynamic indication is solely and **only a G R S principle.**

This **only — always — safe** principle of Dynamic Indication with several other features has brought this system into marked favor with the result that 80% of the power interlocking in use to-day is **G R S Electric.**

This system is equally suited to the 8 and 24 lever plant as it is to the Grand Central Terminal which is the largest interlocking in the world.

Why not install the **only — always — safe — system,** the **G R S Electric Interlocking** employing Dynamic Indication?

“ Safety First ”

GENERAL RAILWAY SIGNAL COMPANY
OF CANADA LIMITED

Office and Works, Lachine, Quebec

Branch Office, Winnipeg, Manitoba
9126C



The Vital Spot

Protect your cars with the National Trolley Guard at the vital spot—the grade-crossing.

When the trolley jumps the inverted trough catches it and furnishes power to carry the car out of danger.

The large mesh offers small resistance to locomotive exhaust and cannot collect ice or snow.

Sold Only by

The Ohio Brass Co.

Mansfield, Ohio, U.S.A.

New Route to the West

Between

TORONTO AND VANCOUVER

By

Canadian Northern Railway

Via

Port Arthur, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Prince Albert, North Battleford, Calgary, Edmonton, Kamloops, New Westminster, Vancouver, Victoria, and All Western Points.

Leave Toronto 10.45 P.M.
Mon., Wed., Fri.



Connections to and from
all points.

Electric Lighted Sleepers, Dining Cars and First-Class Coaches.

For full particulars, through tickets to all points and Berth reservations, apply or write to R. L. FAIRBAIRN,
General Passenger Agent, 68 King St. E., Toronto, Ont.



Permanent Construction Starts With Your Plan
PEDLAR'S "PERFECT" TONCAN METAL CULVERTS

in your specifications mean no culvert repairs or replacements for generations. Pedlar's Culverts bring you the safest, quickest, easiest construction, and as for economy—well—why not make comparisons?

Pedlar's Culverts are made from anti-corrosive **TONCAN METAL** which cannot crack, rust or corrode. Made in all sizes from 8 in. to 84 in. in diameter

and in lengths up to 40 feet. Coupling bands supplied free for longer lengths.

Ask us to send you the complete Culvert Reference Book No. 4 R.M. containing valuable drainage tables and full details as to culvert construction. Write now!

THE PEDLAR PEOPLE, Limited

(ESTABLISHED 1861)

Executive Office and Factories, OSHAWA, ONT.

Branches :

MONTREAL

OTTAWA

TORONTO

LONDON

WINNIPEG

Cut Filing Costs in Half



Filing is like drilling. The moment the file wears smooth, it takes twice, or three times, the energy to accomplish the desired result. Engineers have got it down to a scientific basis in drilling. The moment a drill reaches its "inefficient point," it is discarded and this "efficient point" is determined by the amount of power used to drill a certain dimension.

Workmen are not machinery; consequently you have to depend upon

the personal element and educate your men up to the point where they will know at once when their files have reached the "inefficient point". If you can educate your men to do this you will get double the results at the bench, compared by results when men have been working with files that are inefficient.

Write for our booklet "File Philosophy." It is well worth reading by any manufacturer, shop superintendent, shop foreman or workman who is concerned with the use of files.



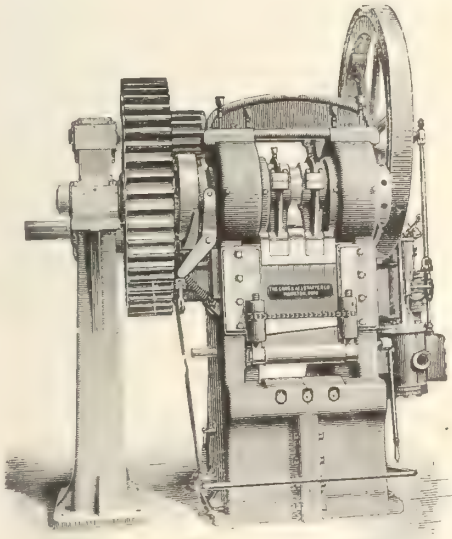
Nicholson File Company

Port Hope

(Dealers Everywhere)

Ontario

Power Punching and Shearing Machinery



Gate Shear---Steam-Driven

Over 350 sizes and styles for all kinds of light and heavy work designed and manufactured by

The Long & Allstatter Co.

Hamilton, Ohio, U. S. A.

Riveting Machines Tire Welding Machines
Armature Disc Notching Machines
Tire Bending Rolls Beam Coping Machines
Bending and Forming Machines

Write for Catalogue if interested. Correspondence invited.



Berry Brothers' Railway Varnishes

Represent Nearly 60 Years of Varnish Making Experience

Berry Brothers' extensive line of Railway Varnishes makes it possible for you to purchase the right varnish for any demand.

Here are a few finishes you should know.

Locomotive Black

A fossil gum varnish of the highest grade--- for the best attainable finish on locomotives, tenders and valuable rolling stock, combines excellence with durability-- efficient because its use is true economy--- a case of the best being the cheapest.

Front End Black

For the front end of locomotives. It covers well, makes a handsome jet black finish, and stands a high degree of heat without injury.

Smoke Stack Black

Made especially for use on smoke stacks, producing a jet black and brilliant lustre, and resisting heat of a high degree without injury.

Let us send you a copy of our Railway Varnish catalog, just issued

BERRY BROTHERS

(INCORPORATED)
World's Largest Varnish Makers

WALKERVILLE

ONTARIO



Don't Pump Your Jack Down

Lower the Load by "Pressing the Button"

The Norton Self Lowering Jack

is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

Send for Illustrated Catalogue No. 28.

A. O. Norton, Limited
Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents :
MUSSENS LIMITED

Montreal Toronto Winnipeg Cobalt Calgary
Vancouver



The Double Track Route

Provides

Service	Comfort
Safety	Courtesy
Speed	Convenience

Grand Trunk Hotels

The Chateau Laurier, Ottawa, Ont.

Accommodation 350 Rooms. Rates \$2.00 per day and upwards. European Plan.

The Fort Garry, Winnipeg, Man.

Accommodation 300 Rooms. Rates \$2.00 per day and upwards. European Plan.

The Macdonald, Edmonton, Alta.

Accommodation 250 Rooms. Rates \$2.00 per day and upwards. European Plan.

Hotels under construction—

The Qu' Appelle, Regina.

The Prince Rupert, Prince Rupert.

Winter Tours to California and all Pacific Coast Points. Florida, Texas, New Orleans, Etc.

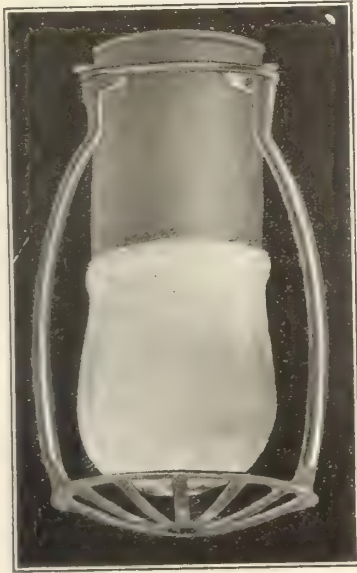
Winter Tours Tickets now on sale. Stop over privilege allowed.

The New Way West

Via the Transcontinental and Grand Trunk Pacific Railway affords new scenery, new interests. Write to any Agent of the Company for advertising matter, rates, and all particulars.

G. T. BELL,
Passenger Traffic Manager, Montreal

W. S. COOKSON,
General Passenger Agent, Montreal



Pintsch Mantle Light

No other system of car lighting gives clean, safe and efficient light without intricate mechanism, subject to defects and failures. Pintsch Mantle Light is the only absolutely dependable method of lighting railway cars.

The Safety Car Heating and Lighting Company

2 Rector Street, New York

718 Transportation Building, Montreal

465 Railroad Shops in the United States and Canada Use the Thermit Welding Process



Let us send you this pamphlet.

This comprises practically all the shops of importance in North America, and it can be said without exaggeration that the list of railroads using Thermit includes practically every system from the small road having only three or four locomotives to the largest system in the world having many thousand locomotives.

If by any chance your shop is not using Thermit, you should investigate the process and see how effectively and economically it will handle the many repairs on locomotive frames and other sections.

Remember that the greatest railway systems in the world use hundreds of thousands of pounds of Thermit. They do not use it for any reason except that it "delivers the goods" and has proven itself a profitable investment.

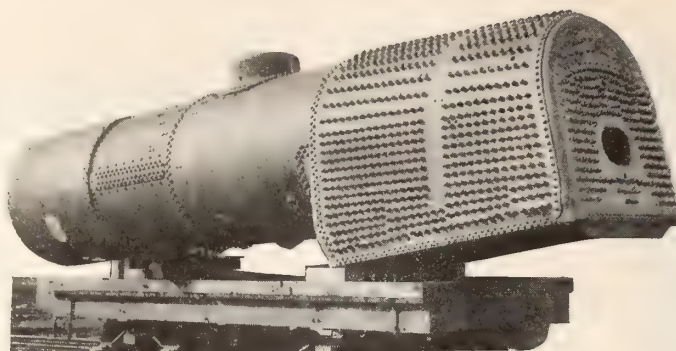
Let us mail you our new pamphlet, No. 2144, which contains full information on the use of Thermit in Railroad Shops.

We have a well equipped shop in Toronto, Ont., for the manufacture of Thermit and appliances used with it.

Goldschmidt Thermit Company

103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco 7300 So. Chicago Ave., Chicago
90 West Street, New York



It is an Established Fact

That fireboxes of all types equipped with the Tate Flexible Staybolt show the lowest maintenance cost and highest earnings.

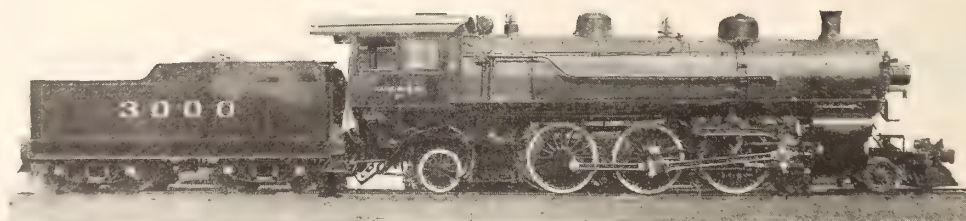
The Flexibility in the bolt serves to accommodate the relative expansion of plates under working operations of the fire box and boiler in a manner that has afforded less destruction to the sheets and seams than were found under conditions where fireboxes were rigidly stayed.

The Tate Flexible Staybolt is designed and made to give satisfactory results in the final measure of its usefulness, as an economic, safe and reliable factor in reducing the costs of firebox repairs and maintenance.

In use on all the prominent railroad systems of Canada.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.



Scientific Treatment of Boiler Waters Dearborn Service to Railroads

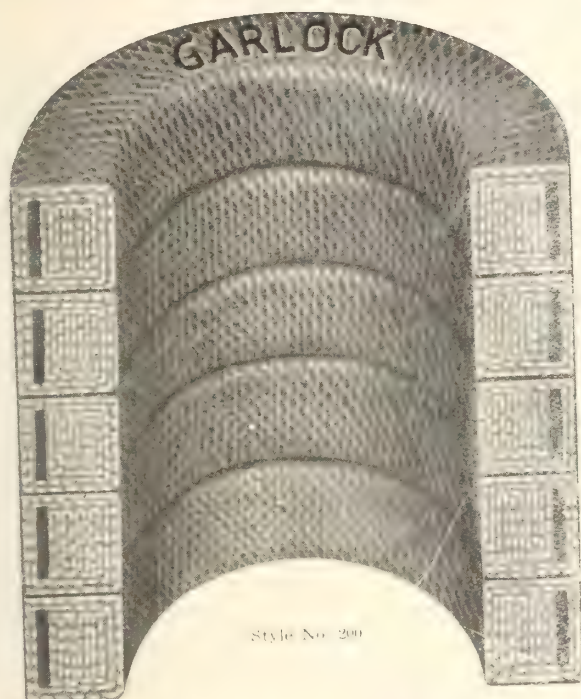
Every time an engine failure takes place it means a large expense in dollars to the railroad company in time lost, impairment of service, and cost to send another engine to the rescue. Every time a locomotive goes to shop for repairs, it represents many thousands of dollars invested capital which is earning no revenue.

By the use of Dearborn Treatment engine failures due to the boiler foaming or leaking can be entirely eliminated. Dearborn Treatment counteracts the foaming tendency in waters of that type, and prevents scale formation, and the corrosive and pitting action that results in leaks. By thus overcoming the bad effects of the waters used, and keeping the boiler tubes and sheets free from

incrustation, the engine may be kept in service longer between boiler washings, and the period between shop-pings for repairs of this character will be much longer. There are also great savings in fuel and lubricating oil, and the engine will always be in condition to haul full tonnage.

Dearborn Chemical Company of Canada, Limited

Office and Works : 1220-1230 Dundas Street, Toronto, Canada



Garlock High Pressure Piston Rod Packing

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.

THE GARLOCK PACKING COMPANY

- Hamilton, Ontario



Branches :

Montreal, Que., 342 St. James St. East Toronto, Ont., Continental Life Bldg.
Winnipeg, Man., Galt Building



Modern High-Class

ROLLING STOCK



Passenger, Freight
and
Electric Railway
Car Castings,
Forgings
and Repair Parts.

Crossen Car Company, Limited
Cobourg - Ontario

Canadian Pacific

For WINNIPEG and VANCOUVER

Leave TORONTO 6.40 P.M. Daily

Via the TRANSCANADA

Through equipment including Electric Lighted
Compartment Observation Car, Standard
and Tourist Sleepers, Dining Car,
First-class Coaches.

"The frequent C. P. R. Service passing through the Business
Centre of each City is an asset to the Traveller."

Particulars from Canadian Pacific Ticket Agent, or write, W. B. Howard,
D. P. A., Toronto

CANADIAN STEEL FOUNDRIES LIMITED

STEEL CASTINGS - MANGANESE STEEL CASTINGS
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK
BAR STEEL

GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
BRANCH OFFICE — TORONTO

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL

Nova Scotia Steel and Coal Co., Limited

Manufacturers of

MARINE, RAILWAY AND GENERAL ENGINEERING FORGINGS OF ALL SHAPES AND UP TO 40 TONS IN WEIGHT, MADE FROM BEST ORDINARY OR HARMET FLUID COMPRESSED OPEN-HEARTH STEEL. OUR FORGE IS EQUIPPED WITH THE MOST MODERN STEAM HYDRAULIC PRESSES.

RAILWAY TRACK MATERIAL, fish plate, tie plate, track bolts, spikes, tee rails—12 to 40 lbs. per yard.

ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

ALSO MINERS AND SHIPPERS OF THE CELEBRATED "OLD SYDNEY" COAL.
HIGH CALORIFIC VALUE—LOW ASH—UNEXCELLED FOR STEAM-RAISING PURPOSES.
BEST HOUSE COAL MINED IN CANADA.

Collieries, Iron and Steel
Furnaces:
SYDNEY MINES, C.B.

Coal Shipping
Piers:
NORTH SYDNEY, C.B.

Finishing Mills, Forge, and
Engineering Shops:
NEW GLASGOW, N.S.

INQUIRIES SOLICITED

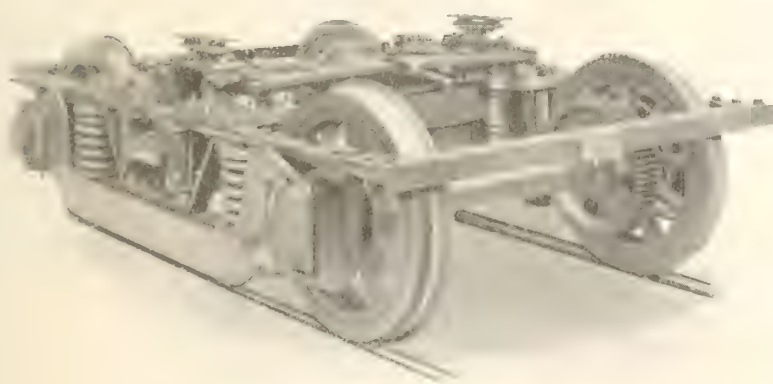
Western Steel Sales Office:
Room 14, Windsor Hotel,
Montreal, Que.

Western Coal Sales Office:
219, Board of Trade Bldg.,
Montreal, Que.

Head Office:
New Glasgow, N.S.

Canadian Baldwin Electric Trucks

Interurban Service



Canadian Baldwin Trucks, Class 84-30-AA, built for Lake Erie and Northern Railway, Ontario.

The truck illustrated is designed for high speed on electric railways, and has a rated carrying capacity of 30,000 pounds on the centre plate.

It has frictional side bearings and is of the equalized pedestal type.

Canadian Baldwin trucks, solve the problem of minimum weight, economical maintenance, simple construction, noiseless operation and easy riding.

There is comfort in riding on roads where Canadian Baldwin Trucks are used.

Manufactured in Canada by

Canadian Locomotive Company, Limited
KINGSTON, ONTARIO



REG. U. S. PAT. OFF.

Every square inch of Du Pont FABRIKOID is as good as the inch next to it; rarely ever so with the finest leather and never with coated splits.

Examination of a leather hide in various places shows plainly that the strength is never the same in any two places in the hide.

Uniformity in strength of materials used by railroads for curtain bindings, cab cushions and vestibule curtains, is an absolute essential when you consider the extremely hard wear to which this class of material is subjected and there can be no other conclusion than "Buy Du Pont FABRIKOID," when you compare its cost and the length of service, with all other materials on the market.

It will pay you to take time, today, to ask for samples and prices.

Du Pont Fabrikoid Company

Du Pont Building, Wilmington, Del.

WENDELL & MacDUFFIE COMPANY

Railroad Department Representatives

59 Broadway, New York

STEEL SHIPBUILDERS

Engineers and Boilermakers



24-inch Suction Dredge built for Canadian Government Harbor service on Hudson Bay.
This is the second largest dredge built in Canada.

Marine Engines and Boilers, All Sizes

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto

Are You in the Market for Trolley Catchers Retrievers, Bases or Headlights

We have appointed the **Allen General Supplies Limited, 205 Yonge Street, Toronto**, who are well known to the traction interests of Canada by reason of their hard and fast policy of handling only the best and standard lines of Electric Railway equipment our Agents for Canada.

Equipment for our Canadian customers is "Made in Canada."

Our Catalogue will be in your hands in a few days.

Trolley Supply Company

Canton, Ohio

Address all Correspondence to

Allen General Supplies Limited, 205 Yonge Street, Toronto

Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE—INTERCOLONIAL RAILWAY

Total weight of engine, 24,000 pounds; weight on drivers, 15,000 pounds; diameter of drivers, 7' inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

Montreal Locomotive Works, Limited

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

For Safety's Sake Specify—



Northern Electric "R. S. A." Wire

- ☐ Buying wire for railway signalling purposes on a price basis is a crime.
- ☐ Climatic conditions, especially in Canada, seriously affect the wire connecting the signals. Extremes of heat and cold, gases, acids, and oils are some of the many elements, that railway signal wire is subjected to and must combat.
- ☐ Northern Electric Railway Signal Wire stands the tests of time. It not only meets but exceeds the "R. S. A." Specifications. It is backed by the largest makers of wires and cables in the country, and sells on a quality instead of a price basis.

Northern Electric Company LIMITED

MONTREAL HALIFAX TORONTO WINNIPEG REGINA CALGARY VANCOUVER



A Clear Track To Promotion

How to get off the side track—how to break the couplings that hold them near the bottom of the pay roll—is the one big problem that troubles most railroaders.

There's a clear track to promotion—without grade or curve—open to the man that has the backbone and grit to take it. Before you can travel this track to promotion and bigger pay you must "coal up" with knowledge—you must be specially trained.

The Railway Instruction Department of the International Correspondence Schools is able and ready to give you the training you must have. You can get it right at home without losing an hour's time from your present job.

It will not cost anything to find out how the I.C.S. can train you for a better job. Put an "X" near the class of work you would like to follow, in the attached coupon, and mail it to the I.C.S. This won't obligate you in the least. It will simply bring full information by return mail.

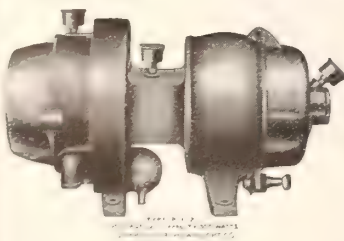
Mark the Coupon NOW

International Correspondence Schools
Box 8403, Scranton, Pa.

Please explain, without obligation to me, how I can qualify for the position before which I mark X.

Locomotive Engineer	Marine Engineer
Air-Brake Inspector	Ocean Navigation
Air-Brake Repairman	Lake Navigation
R. R. Shop Foreman	Coastwise Navigation
R. R. Traveling Engineer	Electrical Engineering
R. R. Traveling Fireman	Electric Car Running
R. R. Construction Eng.	Heavy Electric Traction
R. R. Accounting	Tel. and Tel. Engineer
Bookkeeper	Mechanical Engineer
Stenographer	

Name _____
St. and No. _____
City _____ State _____
Present Occupation _____
Employed by _____



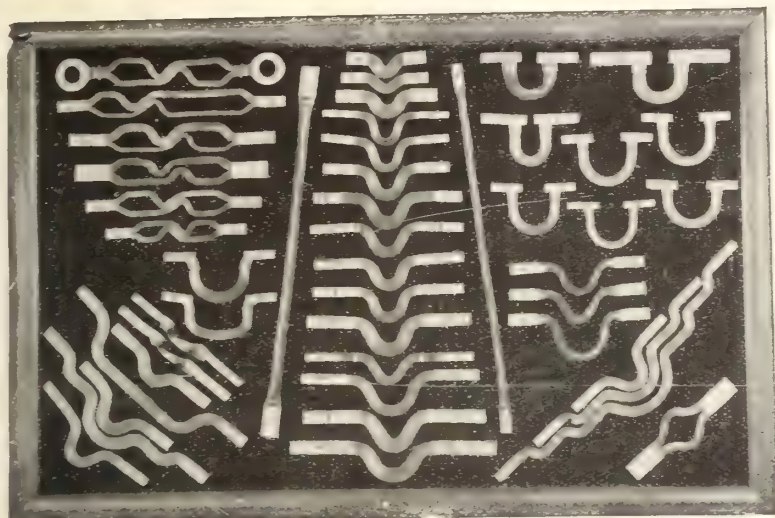
70 Schroeder Incandescent Headlights

In Service
270 days without any expense for repairs.
As a result of this exceptional service
150 more have just been ordered.

The HIRAM L. PIPER CO., Limited
MONTREAL, Sole Agents for Canada

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. BABBITTS. Miscellaneous Brass Castings for Railroads.
Works and Office: 69 Delorimier Avenue, MONTREAL, QUE.



Electric Weld Rail Bonds

meet every condition.

Neither do they corrode at the terminals.

The Electric Railway Improvement Co.

Cleveland, Ohio

Drop Forgings

Made in the Champion Way

Also Steam Hammer and Heading Machine Forgings

Let us have your Blue Prints

The Champion Machine & Forging Company
CLEVELAND, OHIO

New York Office:
30 Church St.

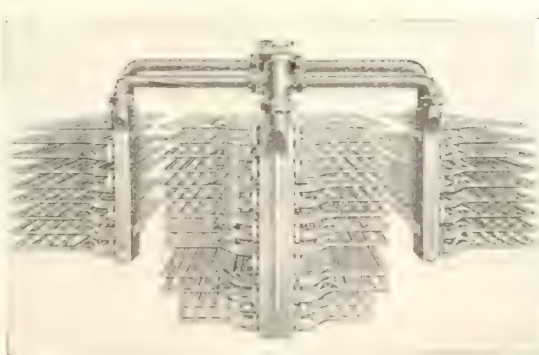
Philadelphia Office:
Bourse Building.

Detroit Office:
H. B. Kendal, 56 Cadillac Sq.

Chicago Office:
1623 Monadnock Block

Fire Tube Marine Superheater -- Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler h.p. from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, New York, N.Y.

Peoples Gas Bldg., Chicago, Ill.

Algoma Steel Corporation, Limited

Manufacturers of
Steel Rails, Splice Bars, Tie Plates, Forging Billets, etc.

We would be pleased to have your enquiries for 1916 deliveries.

Works and Sales Department: Sault Ste. Marie, Ontario, Canada

The Light of Day on the Right of Way

Headlights

Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

Car Lighting

Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency with economy. Standard cylinder supplies from one to two months' lighting of the average car.

Signals

Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

Commercial Acetylene Railway Light and Signal Company

103 BAY STREET, TORONTO

Main Office, 80 Broadway, New York

Branches, Atlanta, Boston, Chicago, San Francisco

American Flexible Staybolts

Manufactured in Montreal



Made of the best standard staybolt iron, adding flexibility by process of making as shown above---closely approximating a rope structure.

Write for booklet on subject.

TAYLOR & ARNOLD, Limited
MONTREAL WINNIPEG

Jas. W. Pyke & Company, Limited

Iron, Steel and Metal Merchants

Locomotive, Driving, Engine and Tender Truck Axles, Passenger, Freight, and Electric Tram Car Axles—To Standard or Railway's own Specification.

Staybolt and Engine Bolt Iron—Quality and Service Unexcelled.

Steel Plates—Firebox, Flange and Tank Qualities.

Structural Shapes—Beams, Channels, Angles, Tees, Zees, etc.

Steel Billets and Forgings—of all descriptions.

Locomotive Boiler and Superheater Tubes—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
232 St. James Street,

Montreal



These Reinforced Brake Shoes weighed approximately twenty pounds each when put in service. When ready for the scrap heap, after long and satisfactory use, they weighed about six pounds each.

Just compare this record with that of ordinary unreinforced brake shoes. Almost invariably they go to pieces before being half worn out, and their average scrap weight is about fifteen pounds.

No argument for ordinary shoes can meet the demonstrated facts that stand behind Reinforced Brake Shoes.

Manufactured in Canada.

Dominion Brake Shoe Company, Limited

The HOLDEN CO., Limited, Agents.
350-356 St. James Street, MONTREAL

Thor

Single Valve Pneumatic Chipping Hammer

5 Sizes 1 to 5 in. Stroke



Equipped with a single valve with mechanism so perfectly balanced as to eliminate all vibration.

Light Durable
Powerful.

For all work from the lightest chipping and scaling to heavy chipping and calking.

Shipped on Trial—FREE.

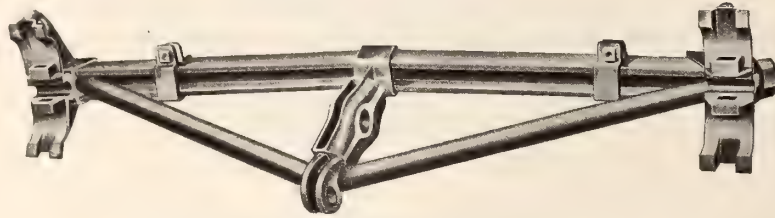
Independent Pneumatic Tool Company

334 St. James St., Montreal, Que.

Buffalo Brake Beam Company

BUFFALO BEAMS ARE BEST BEAMS

Offices:
NEW YORK
 30 Pine Street
ST. LOUIS
 Syndicate Trust Bldg.
MONTREAL
 195 Commissioner St.



Works:
BUFFALO,
N.Y.

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment

Linking Prairie With Ocean

Winnipeg **Cochrane** **Quebec**
Montreal **St. John** **Halifax**
Charlottetown **The Sydneys**

Canadian Government Railways

Operate Over 4,000 Miles of Railway

Transcontinental Ry., Intercolonial Ry., Prince Edward Island Ry., St. John and Quebec Ry.

Montreal and Halifax—Maritime Express,
 Daily—Connection for St. John, Prince Ed-
 ward Island, Newfoundland except Sunday.

**THROUGH
EXPRESSES**

Toronto and Winnipeg—The National
 (tri-weekly service)—A NEW train via a
 NEW route through a NEW country.

F. P. Gutelius, General Manager. C. A. Hayes, General Traffic Manager. H. H. Melanson, General Passenger Agent.

Head Offices: MONCTON, N.B.

Canada Iron Foundries, Limited

Chilled Tread Cast Iron Car Wheels for All Services
 Cast Iron Water, Gas and Culvert Pipe,
 Flanged Pipe and Specials
 Railway Castings

HEAD OFFICE:

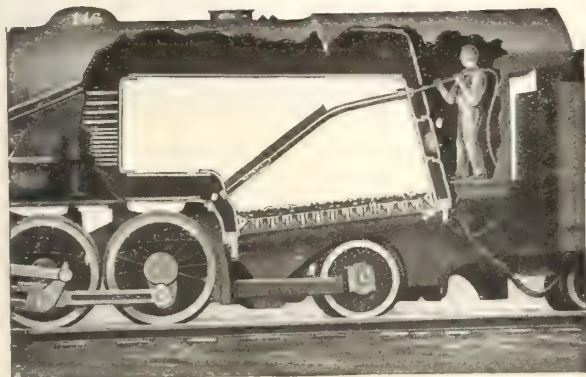
Mark Fisher Building

- - -

Montreal



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes.

Lagonda Arch Tube Cleaners

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

Other Lagonda Boiler Room Specialties are described in our General Catalogue L-8. Send for Copy.

Babcock and Wilcox, Limited

Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Building

THE STAR BRASS WORKS
KALAMAZOO, MICH.

The Star Brass Works

Largest Exclusive Trolley Wheel Makers in the World.

Kalamazoo

Michigan



REAMERS

Cutters, Taps, Dies
and Drills

"P. & W. Co." Insures QUALITY

See that it is on the tools you buy.

Pratt & Whitney Co. of Canada, Limited

Dundas, Ontario
Vancouver

Winnipeg

Montreal



28 "Service" Branches Throughout Canada

Canadian Consolidated
Rubber Co., Limited
Montreal, P. Q.



Efficient Service

Our constant aim is to give you EFFICIENT and RELIABLE SERVICE, the kind that leaves an impression of personal attention.

"Service" Branches throughout Canada, with complete stocks, make quick and prompt deliveries possible.

**If It's Rubber
The Dominion Rubber System
Has It.**

Write for catalogue, and let us show you how well we can serve you.



Canadian Consolidated
Rubber Co., Limited
Montreal, P. Q.

28 "Service" Branches Throughout Canada



Canadian Railway and Marine World

April, 1916.

Toronto Hamilton and Buffalo Ry. Grade Separation in Hamilton.

The question of raising or depressing the T.H.&B.R. main line through Hamilton, Ont., or of moving the tracks to another location altogether, has been agitated for several years. In 1914, Westinghouse, Church, Kerr & Co., who were employed by the company to investigate the matter, prepared a scheme for track elevation, and in 1915, W. F. Tye, M.Can.Soc.C.E., of Montreal, on behalf of the applicants for grade separation, presented an alternative plan of depression. The question was before the Board of Railway Commissioners on several occasions and was referred to its Chief Engineer, G. A. Mountain, who made two reports, copies of which we have been favored with.

In the first report dated Jan. 15, 1915, Mr. Mountain said: In accordance with the Board's instructions, at a meeting held in Hamilton, on Dec. 14, 1914, in connection with the application of Sealey and others for track depression of the T.H.&B.R., from the tunnel across James, John and other streets in Hamilton, to Victoria St., a conference of engineers was held in my office, presided over by the Engineer, on Jan. 13 and 14, 1915. The representatives were W. F. Tye, M.Can. Soc.C.E., for the applicants, A. F. McCallum, City Engineer, for the city and R. L. Latham, Chief Engineer for the T.H.&B.R. Associated with the latter were L. W. Tucker, and G. W. Burpee, of Westinghouse, Church, Kerr & Co. There was also present J. W. Pfau, C.E., Engineer of Construction, New York Central Rd., A. L. Sarvey, Assistant Valuation Engineer, Michigan Central Rd., J. W. Orrock Principal Assistant Engineer, C.P.R., A. S. Going, Engineer of Construction, G.T. Ry., E. G. Hewson, Division Engineer, G.T.R., Toronto, the latter road being interested in the connection of the branch line from Ferguson Ave. Subsequently, the railway company filed a plan for track elevation instead of track depression, along the same section. We went thoroughly into the merits of both track elevation and track depression and the cost of the same, and Mr. Tye, representing Sealey and others, decided he would want more time to revise some estimates and check over some of the estimates submitted by the T.H.&B.R. on the cost of track depression. I suggested a modification of both plans and that the parties get out estimates on that suggestion, which they thought was well worth considering. It was also decided to make a test pit at the mouth of the tunnel.

Mr. Mountain's second report dated Jan. 18, 1916, is as follows: The parties met again in Hamilton, in April, 1915 and went thoroughly into the examination of the test pit that had been opened by the T.H.&B.R. authorities at a point designated and satisfactory to all parties. We found material in this test pit that might be considered of a quick sand nature and also that water rose in the pit to pretty near the surface of the ground. We then continued to work out the actual cost of the work and on this all parties have agreed.

The cost of the track elevation is

\$673,000. The cost of the track depression is \$965,000. R. L. Latham, Chief Engineer of the T.H.&B.R., agreed to this cost with a proviso that no unforeseen conditions arose. I understand from that that he means from this such conditions as we felt were indicated by this test pit in excavating for lowering the tunnel 12 ft. at its portal. The engineers associated with Mr. Latham, and Mr. Tye, acting for the city, felt that business could be continued through this tunnel during the time that it was being lowered for a length of 800 ft. from nothing to 12 ft. at the portal. My opinion is that this would be a very difficult thing to do and I have very much doubt whether it would be possible to continue traffic through while it was being lowered. In addition to the construction there is the cost of the right of way. I have spent a lot of time on this and have not been able to arrive at a very satisfactory result. It is very difficult to estimate the value of land when it is to be purchased for this purpose. However, there is no doubt that the land required for the track depression exceeds the land required for the track elevation, and I roughly estimate the land damage on the track elevation at \$331,000 and on the track depression at \$537,000. It was stated that owing to the fact that the track depression would carry the railway away from its present station facilities, they would be available for sale, but to give the company the equivalent of the land it already has on its present facilities, would add an increased cost to the land expenses, which would be about even to the sale of the present station property. In addition to that there would be consequential damages, which are only estimated, and which I have put in for the track elevation at \$151,000 and for track depression at \$148,000. Adding these I make the approximate cost of track depression \$1,650,000 and the track elevation at \$1,161,000. While there has been a good deal of discussion as to the amount of the land damages, and I have made several trips and gone thoroughly over the ground several times, I feel that I am unable to arrive at any other conclusion as to the land damages but that it is only approximate and may vary \$100,000 one way or the other. The items on the cost of construction are, I think, as close as it is possible to get and the land damages are what might be termed an approximation.

As to the merits of the case. The track depression suggested by the city lends itself to the opening of Hunter St. its entire distance, except that the crossings by overhead bridges would slope well out on Hunter St. at several places, for instance at Charles, McNab, James, John and Catherine. Hunter St. would then be like an up and down grade at these points, but nevertheless open for traffic. At present Hunter St. stops at Park St. and then the tracks run on the level from Park St. to practically Catherine St., but vehicular traffic has been allowed to use it, driving alongside the tracks. This is a pretty dangerous pre-

cedure and should not have been allowed, but apparently it has been going on for years. Most of the traffic is in connection with railway work along Hunter St. between John and James Sts., to express company's warehouses which are situated in that section.

The track elevation scheme would practically cut out the use of Hunter St. from Park to Catherine; that is it would prevent any use of that portion of the street for vehicular traffic and, in addition, would leave Charles and McNabb Sts. at grade level, protected by gates as they are at present, or else closed to vehicular traffic and opened by pedestrian subway, which is all that could be got at these points. These streets are not important and would not, unless the whole question of grade separation came up, be over considered as points warranting subways, as practically all the business is done first on James St. and second on John and other streets to the east, which would all be taken care of by track elevation or depression as far as Ferguson Ave.

In connection with the operation of trains, I attach a plan which is explanatory of the conditions as they are on the level, as they would be elevated, and as they would be depressed. The present station facilities lie between James and John Sts. and whether it be track elevation or depression, that location would not be changed. The operation of trains is easier at their present location, at ground level than either of the other means, elevation or depression. Elevating the tracks would continue a 1% grade rising from the mouth of the tunnel to James St., about 1,000 ft. Depressing the track from the tunnel to James St. for 1,300 ft., would give a falling grade of 9/10%. This depressed grade would then continue level for 1,800 ft. approximately 16 ft. below the present level of the ground, and would then rise 1,750 ft. by a 1% grade to the surface at Victoria Ave. This, to my mind, would make a tremendous difference in the operation of the railway. Heavy trains coming through, both freight and passenger, particularly if they had to stop at the station, which all passenger trains would have to do, would have great difficulty in making these grades in either direction and would be a most serious drawback to the operation of the railway. It would make it one of the worst places conceivable for the location of a station and would hamper the operation of the road through Hamilton to a very great extent.

The city's second idea was that the T.H.&B.R. be moved to the location of the G.T.R. present tracks, and that, to my mind, would be the proper solution of this question but it has been found impossible to do it. The T.H.&B.R. has spent a great deal of money in building its tunnel and on other works in connection with its present location, which could not be picked up and moved easily.

The noise from trains running in track depression in this locality would be less than on track elevation, but the smoke

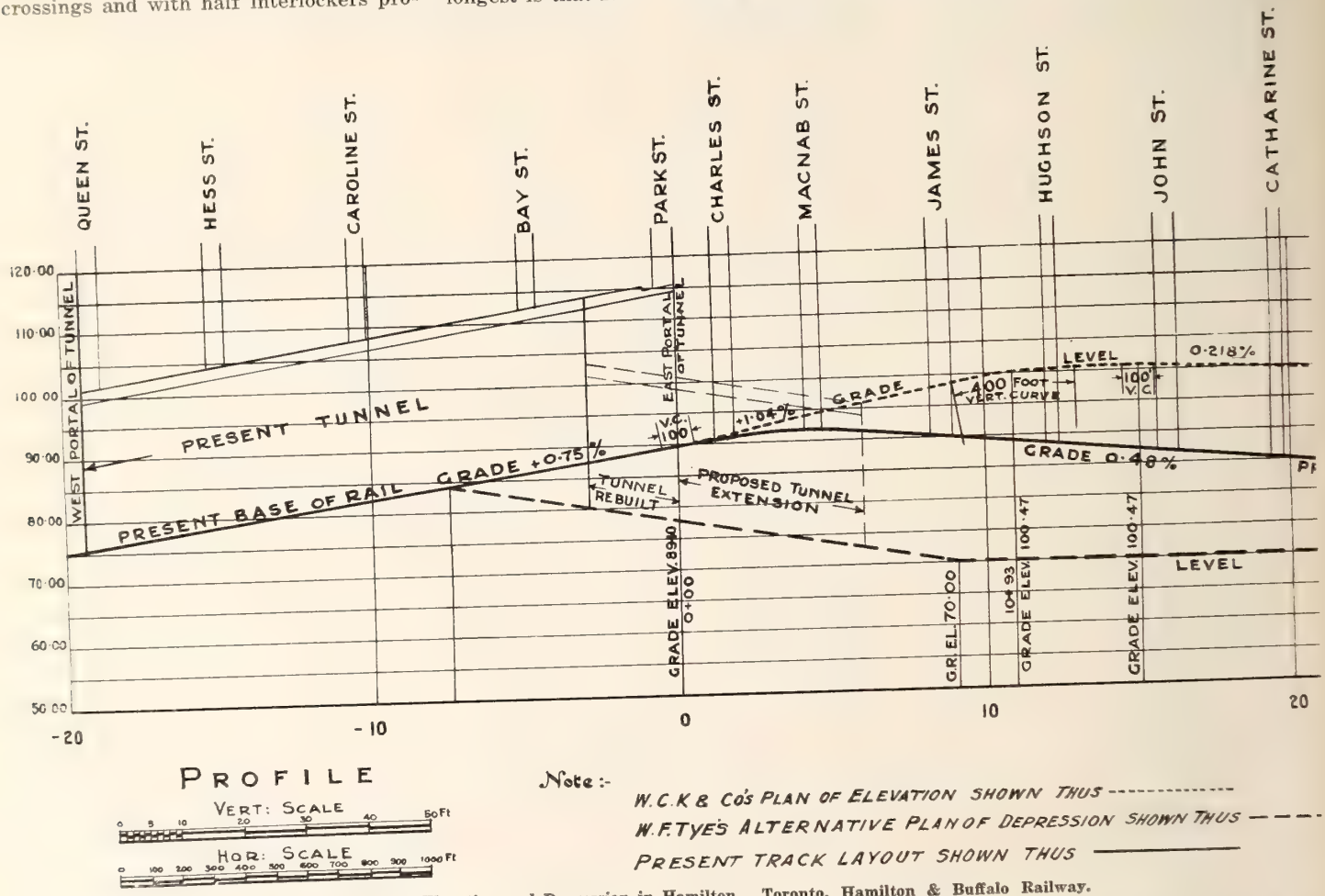
there is one of the big nuisances complained of in the application, and it would be greater in track depression than on elevation so long as steam power is used; and it does not seem to me that the density of the T.H.&B.R. traffic would warrant going to electric motors through this section at present. Taking everything into consideration that I can think of, I am of opinion that if grade separation is to be made at this point, then in the greater interest of all parties, track elevation is the proper method for economy of operation, business interests adjoining the railway and for relief from the smoke nuisance, but I do not think that the T.H.&B.R. business at present time through the City of Hamilton, with gates protecting practically all its level crossings and with half interlockers pro-

portal of the tunnel, but it has not advanced any suggestions officially. It is added that the question of eliminating the smoke is rather a difficult one, that the installation would be expensive and the operating cost extremely high.

The Railways of Venezuela.

H. K. Wicksteed, M.Can.Soc.C.E., Chief Engineer of Surveys, Mackenzie, Mann & Co., Ltd., Toronto, who spent some time in Venezuela last year in connection with a railway and coal mining proposition, wrote an interesting article on the country, which was published in Canadian Courier, from which the following is reproduced: "Of the railways, the longest is that from Caracas to Valencia,

an extraordinary descent along the mountain slopes of Las Tejas. There are 86 tunnels and over 100 steel viaducts on this piece of line; or, roughly, two of each for each mile of road, and the scenery is magnificent. But in a tropical climate, windows must of necessity be open, and in the long tunnels the smoke and gases from the engine make one imagine himself in a Belgian trench, and are somewhat trying to lungs and throat. It is possibly in the operation of this railway that the Germans got their ideas of asphyxiation. At Las Tejas, the railway reaches the bottom of the valley, in which is situated Valecia, its lake and many smaller towns, and the construction is comparatively easy and cheap. As a financial venture, the railway is a failure."



tecting the electric car system at crossings with the T.H.&B.R. warrants any change being made in the location of the tracks.

There is an objectionable feature in the way smoke comes out of the tunnel after trains have passed through, particularly at the portal next to James St. It can be noticed curling for some time after a train has passed through and is objectionable. I suggest that the company consider the advisability of putting a shaft near the upper end of the tunnel, which is the easterly portal, and fanning the smoke up into the air where it would disperse instead of coming out of the roof of the tunnel and flowing over Park St. This is merely a suggestion which might be looked into.

In reference to Mr. Mountain's suggestion as given above, we are advised that the T.H.&B.R. management has considered the question of providing ventilation to prevent smoke rolling out of the east

some 220 kilometers, or 130 miles, built and controlled by the Germans. The most lucrative is the English road from Caracas to its seaport, La Guayra, about 27 miles. The last is among the scenic and engineering curiosities of the world, climbing an elevation of 3,100 ft. in 25 miles, with grades of nearly 4%, and almost continuous curvature, as sharp as 140 ft. radius. In spite of these economic drawbacks, the traffic has been carried on continuously without accident for many years and pays good dividends on its stock. Considering that its passengers pay 10c. a mile, and freight in proportion, and that it connects a population of 150,000 or more people with the outside world, it should pay.

"The German railway is a much bolder conception, and cost over its mountain section of 40 or 50 miles a much larger sum of money. It winds up the canyons of the Guayra to its source, tunnels through the Andes and then commences

The Chicago Railway Terminal Problem is again to be taken up by the city with a view to the concentration of the present passenger terminal stations. Under ordinances passed some time ago the Illinois Central Rd., is required to build a new terminal station on a site adjacent to the present station, in order to make way for the extension of 12th St. to the lake front and for the improvement of Grant Park. The council committee on railway terminals has been directed to confer with the several railways entering from the south in order to determine upon the exact location of the new Illinois Central terminal and to provide for its use by other roads which now run beyond 12th St. and use the Dearborn, La Salle and Grand Central terminal stations.

V. J. Smith, heretofore at Windsor, Ont., has been appointed agent, Canadian Ex. Co., St. Thomas, Ont., vice C. W. Ward, resigned.

Freight Rate on Tank and Still Structural Material from Sarnia to Regina.

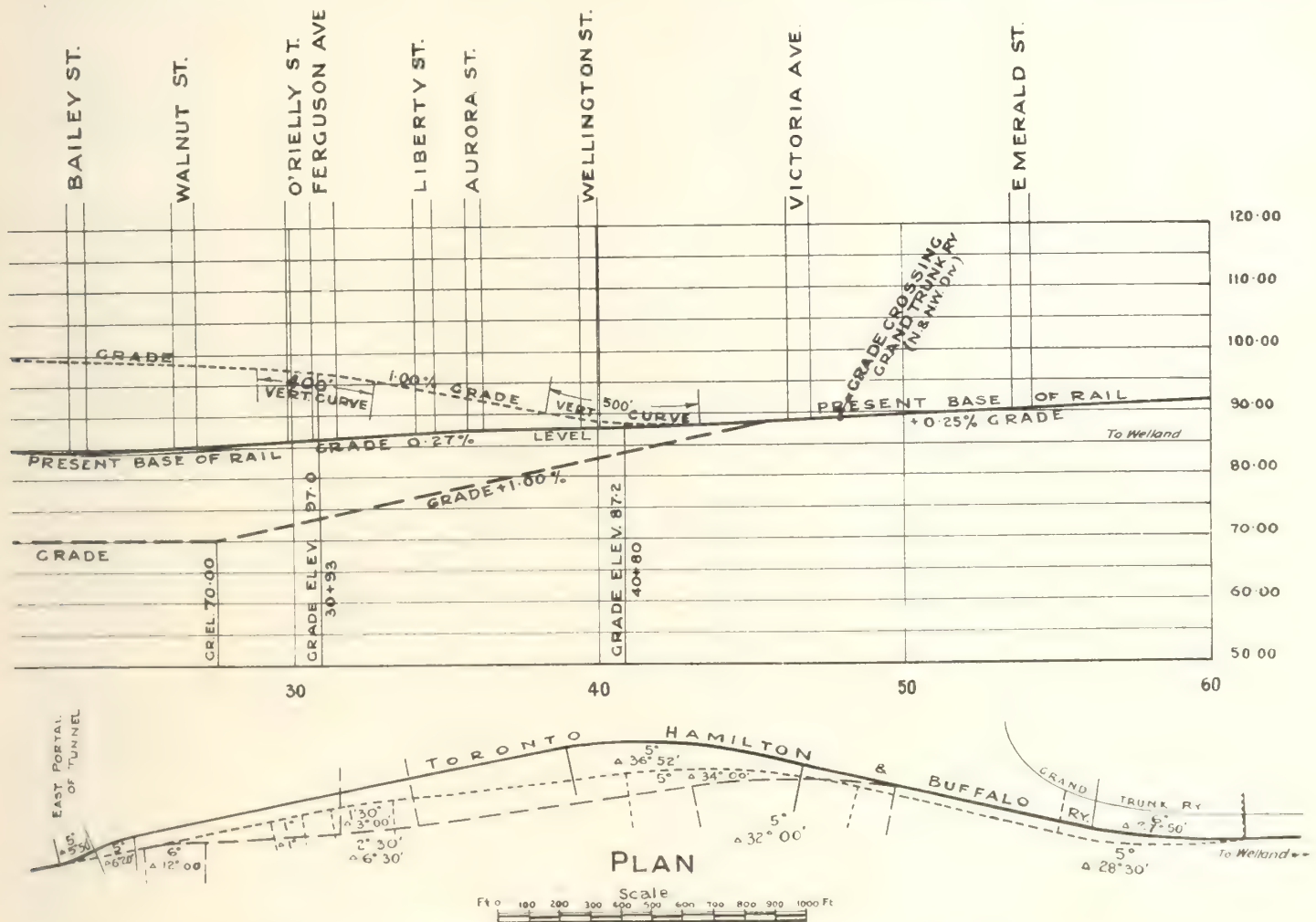
The Chief Commissioner of the Board of Railway Commissioners, Sir Henry L. Drayton, K.C., has given the following judgment, which has been concurred in by Commissioners McLean and Goodeve:

At the Board's sitting held in Ottawa on Feb. 9, two cases closely related were heard, and considered together. The one involved the consideration of Special Freight Tariff C.R.C. no. E. 732, issued by the Canadian Northern Ry., the company being required to support the tariff and show cause why it should not be cancelled as being made in contravention of

of oils and gasoline was confined to a three months period, and as during that period, which may be termed the "peak," three or four times the number of containers and transportation facilities (tank cars, and the like) are required than at other times of the year, it determined that it was necessary to erect a refinery in Regina and distribute from that point. Desiring to have the steel materials necessary for the erection of the plant fabricated in Canada and at their Sarnia works, the Imperial Oil Co. approached the Pere Marquette Rd. with

International Boundary refused to reduce their rate and probably brought pressure to bear upon the Pere Marquette, so as to prevent the long haul on the movement out of Sarnia being enjoyed by the United States companies.

The Canadian carriers were then approached, but the Imperial Oil Co. was unable to obtain any concessions from any of the carriers having connection with Sarnia. The Canadian Northern, however, subsequently agreed to put in the tariff in the question and filed it. The special rate of 75c. that the Imperial



Schemes for Track Elevation and Depression in Hamilton. Toronto, Hamilton & Buffalo Railway.

the "Equality" and "Joint Tariff" provisions of the act. The other application was one made by the Imperial Oil Co., for an order under sec. 344 of the Railway Act, requiring that a joint tariff should be filled from Sarnia to Regina, at a rate of 75c. per 100 lbs., applicable on tank and steel structural material. The Pere Marquette Rd. and the Canadian Pacific, Canadian Northern, and Grand Trunk Railways being interested, either in portions of through movements or in alternative routes. Reference to the circumstances under which the so-called Canadian Northern Proportional Special Tariff came to be put in is necessary.

The Imperial Oil Co., carrying on a very large business in the Northwest, stated that in view of the fact that by far the largest part of the distribution

the view of obtaining a special rate from the Pere Marquette of 75c. to Regina. The Pere Marquette representative agreed to make this special rate of 75c. transportation to be made via Chicago over the lines of the American companies connecting with that system, with the result that the American lines would get the long haul. The Imperial Oil Co. thereupon obtained its materials in Pittsburgh, shipped them to Sarnia, and have at least in part already fabricated them. The movement is considerable, some 5,000 tons being involved. The Pere Marquette then declined to maintain the rate, or indeed to put it into effect; and, while nothing is said as to the reason for it, I take it for granted that the Canadian roads over whose tracks the shipment would have to go to Regina from the

Oil Co. desired in the first instance from Sarnia to Regina was required so as to meet Pittsburgh rate of 93.9c. to Regina, the rate from Pittsburgh to Sarnia being 18.9c. As the Canadian Northern has no connection with Sarnia, the traffic from Sarnia to Toronto, moving on the Pere Marquette and Canadian Pacific railways would pay the established rate of 16½c. and, therefore, it became necessary that, in order to equal the 75c. rate as desired by the Imperial Oil Co., a special rate of 58½c. should be made by the Canadian Northern from Toronto to Regina. The tariff that company filed is said to be a Special Proportionate Freight Tariff of rate on Tank and Still Structural Material from Toronto to Regina, and is made applicable only on shipments originating at Sarnia and does not apply to points

intermediate to Regina. The required rate of 58½c. is made. The Canadian Northern supports the tariff as being proper under the provisions of sec. 326, s.s. 3, of the Railway Act, which reads as follows:

The special freight tariffs shall specify the toll to be paid, lower than in the standard freight tariff, as determined by the company for any particular commodity or commodities, or for each or any class or classes of the freight classification, or to or from a certain point or points on the railway; and greater tolls shall not be charged therein for a shorter than for a longer distance over the same line in the same direction, if such shorter distance is included in the longer."

This provision undoubtedly allows special freight tariffs and commodity rates. These tariffs, however, are just as much subject to the provisions of the act, relating to equality and to joint rate movements, as are the original standard tariffs. The section itself provides that greater tolls shall not be charged under such special tariffs for a shorter than for a longer distance over the same line in the same direction, if such shorter distance is included in the longer.

The tariff is confined in its operation to shipments originating in Sarnia, 232 miles from Toronto; and provides for the carriage of the material in question to Regina, 357 miles west of Winnipeg. The rate is not extended to Winnipeg, and the Canadian Northern tariffs, before the tariff under consideration was filed, provided a rate from Toronto to Winnipeg 62c. and to Regina 86c. The articles forwarded do not all take the same class, but 6th class to all intents and purposes applies and the rates quoted are those of the 6th class. The rate from Sarnia to Regina is 86c, the same as the rate from Toronto to Regina. The tariff in question reduces the rate applicable on the Canadian Northern lines 27½c. The Canadian Northern does not suggest that the 86c. rate is too high. On the other hand, the consistent position taken by that company in cases being considered by the Board, is that it requires every cent of revenue that it can get and that it should not be called upon to forego any. The tariff is sought, however, to be sustained as a competitive freight tariff. So far as the Canadian Northern line is concerned, it is difficult to see how any effect can be given to this argument. The Canadian lines have the right to differentiate any rates to the extent necessary to meet the advantages enjoyed by one company over the other that a shorter mileage creates. Carriers cannot go further than this without rendering their tariffs subject to attack, unless the tariff scheme is carried out in its entirety. In the regular existing tariff the Canadian Northern has already met the shorter Canadian Pacific mileage to Regina and publishes the same rate. It cannot be contended that Toronto—Regina business or Sarnia—Regina business is more highly competitive than business to Winnipeg, or that concessions granted to manufacturers at one point should be denied those at others when similar conditions prevail.

The Winnipeg Board of Trade has intervened. Its telegram read, at the hearing, is as follows:

"Informed Commission will tomorrow deal with reduced rate structural steel ex Sarnia, Toronto, Regina 58½c. On behalf members seriously affected, this Board protests strenuously against any reduction eastern to western points unless corresponding reductions made rates into and out of Winnipeg to keep manufacturers fabricating steel at Winnipeg at least in same relative position to eastern manufacturers that now exists under Commission's decision in Western Rates Case. Writings."

This telegram has been followed up by the following written submission:

"If reduced and special rates below those ordered

by your Commission in the Western Rates Case are made from manufacturing centres in Eastern Canada to points in Western Canada as occasion arises, without any corresponding reductions in rates into and out of Winnipeg, it must be readily apparent to your Commission that Winnipeg manufacturers will be deprived of their just rights to compete with Eastern manufacturers on requirements at Western points, and this section feels that the Commission should not, and no doubt will not, lend its sanction to any basis of rates that will bring about such disastrous results to Western manufacturers."

In this connection, the different mileages involved are as follows: Pittsburg to Sarnia and Sarnia to Regina, via Grand Trunk and Canadian Pacific, 2,163 miles. Pittsburg to Sarnia, and Sarnia to Toronto (P.M. & C.P.) Toronto to Regina, the route that the proposed tariff takes advantage of, 2,288 miles. Pittsburg to Sarnia, Sarnia to Regina, via Pere Marquette, Chicago Line, and Northgate, which would appear to be the route originally contemplated by the Pere Marquette, 1,958 miles. Pittsburg to Winnipeg, Winnipeg to Regina, 1,697 miles. It will be observed that the route covered by the tariff in question is 125 miles longer than if ordinary route from Sarnia to Regina had been adopted, while steel originating at Pittsburg, fabricated at Winnipeg instead of being fabricated at Sarnia, has a mileage of but 1,697 miles, 591 miles less.

One of the matters which received very careful consideration in the Western Rates Case, and an underlying principle applying to tariffs, is the right of distributing points or manufacturing centres to the advantages of their geographical situation which should not be taken from them by any artificial or discriminatory rates. Apart from some special circumstances or extraordinary rate, it is quite clear that there would have been an advantage in fabricating this steel in Winnipeg rather than in Sarnia. Had the shipment taken this course, the rate would have been \$1.01.2 6th class, against the regular Sarnia rate of \$1.04.9. Again the regular Canadian Northern rate from Toronto to Winnipeg is 62c, while the rate in question carries the same commodity over the same lines in the same direction through Winnipeg and 357 additional miles to Regina for 58½c. Apart from these considerations, sec. 333 of the Railway Act provides for joint traffic. The duty is cast on the railway companies to put in joint rates, a duty which can be enforced in case of failure under sec. 334. Joint rates were in effect applicable to the traffic in question—joint rates which the Canadian Northern does not attempt to show are excessive or improper. The whole answer is that of competition. Reference should be made in this connection to sec. 337, which provides:

"No company shall, by any combination, contract or agreement, expressed or implied, or by other means or devices, prevent the carriage of goods from being continuous from the place of shipment to the place of destination."

The scheme of the act is that traffic moving over the lines of two or more companies shall be considered and carried as through traffic on the one bill of lading, and not that local rates should be filed as proportionals and the traffic move under separate bills. The proportionals rate is something which the act does not provide for in terms at all; and, while it is quite true that through traffic shipped on a through bill of lading may move on the sum of the locals so that in a sense the local is a proportion of the through rate, it nevertheless is true that the local rate is open for every shipper to take advantage of and is not confined to a shipment originating at some particular point miles away on the one hand,

or to a particular destination on the other. The present rate, although claimed to be proportional, can hardly be so described when the result is not to maintain the joint rate out of Sarnia but to reduce it 27½c. Special arrangements cannot be given effect to between railways and shippers. Traffic must be moved on the tariffs filed—no more and no less; and these tariffs must be free of unjust discrimination and comply not only with the general sections but, in cases applicable, with the joint traffic sections of the Act.

There remains to be considered the application made by the Imperial Oil Co. for an order directing the companies affected to file through tariffs providing a commodity rate on the material in question from Sarnia to Regina of 75c. The application is urged in the public interest. The applicants show that the cost of fabricating in Sarnia amounted to \$9 a ton; so that fabricating in Sarnia resulted in an expenditure of \$45,000 in Canada, something unquestionably in the public interest. The position of the Canadian Pacific Ry. on the question of fabricating is that Customs Tariff, items 331 and 382, provides a tariff of \$3 and \$7 a ton on different classes of unfabricated iron and steel material, while item 391 provides for a duty of 35%, amounting as claimed by the Canadian Pacific to a duty of \$20 to \$24.50 a ton on the fabricated material. The applicants showed that on the material in question the difference in duty did not exceed \$7 a ton, and that of this \$7 a ton, the additional cost of fabricating in Canada absorbed over \$5, with the result that a sum less than \$2 represented the company of Canadian fabrication, with the further result that, on a freight basis, the economy worked would represent a sum not exceeding and possibly less than 10c. a 100 lbs.

There is, of course, another public interest to be considered. That is the transportation interest—possibly representing, next to the great agricultural industry of the country, the largest public interest. On the large movement in question, its carriage through the United States, instead of through Canada as originally arranged, would represent a loss to the Canadian railway industry, based on a 75c. rate, of \$75,000 of revenue, less, of course, the short local movement which would still remain available to the Canadian roads. The applicants give no evidence as to the unreasonableness or otherwise of the present Sarnia rate, except that which may be inferred from the fact that the Pittsburg-Regina rate is lower than the combination of the Pittsburg-Sarnia and Sarnia-Regina rates, amounting to \$1.04.9, and from the further fact that the Pere Marquette Rd. at one time voluntarily agreed to this 75c. rate. The larger part, however, of the earnings under that rate meant just so much found business to the United States lines; and it was a rate which they chose to put in, doubtless in order to get the business, and not a rate fixed by any rate regulating tribunal as reasonable. On the other hand the Pittsburg-Regina mileage is 1,591, while the Sarnia-Regina mileage is 1,773. At a rate of 93.9 the Pittsburg movement makes a mileage return of 1.18c. and the 86c. Sarnia movement 97 hundredths of a cent per ton mile. The Pittsburg rate proves nothing, except that iron and steel commodities can move west more cheaply out of Pittsburg direct than out via Sarnia. It affords no evidence whatever that the Sarnia rate is unreasonable.

The statement is also made that the

rate is only a paper rate, and that no traffic moves under it. The iron and steel rates of the country stand in a certain relationship one to the other. The commodity moves, speaking generally, under the 5th and 6th class in carloads; and, while there may or may not have been any traffic to move out of Sarnia and none moving from that point, there is no doubt at all that traffic of this character moves and is moving freely. The same 86c. rate applies from Hamilton and Montreal, and also from Walkerville, where there is also a bridge plant. The large viaducts and bridges in the west, many of them fabricated in the east, need only be instanced. At present, it is true, that a large portion of this business, perhaps indeed most of it, is now fabricated in the west for the west. The large plant of the Manitoba Bridge Co. and the branch factory established by the Dominion Bridge Co. in Winnipeg, may be taken as evidence of this fact. While this is true, no new tariff structure can be justified, the effect of which would be to favor the eastern fabricator of iron and steel as against his western competitor in the western market.

Before the Board can give effect to the application, the unreasonableness of the present rate must be established. If unreasonable ex Sarnia, they cannot very well be reasonable ex Hamilton, with its shorter mileage. The simple fact that the Imperial Oil Co. has a specially large shipment to make and on which large traffic returns could be earned cannot be considered by the Board as overruling other considerations. It is true that under the act the tolls for larger quantities may be proportionately less than the tolls for smaller quantities (s.315, s.s.3). Effect has been given to this section in the lower car lot rates—in the lower rate basis given the carload as against less than carload movements. Further than this the Board has not, and in my opinion ought not to go. There is no real handicap on the smaller manufacturer or dealer under this system. Practically all engaged in the handling of the different commodities that move in carloads have enough business to provide for a carload movement, which in turn represents a greater transportation facility and lessens railway expenses. On the other hand, were rates for movement of 5,000 tons, for example, less than for 2,500 tons, it would be simply handicapping the smaller dealers and bonusing the larger. If the system were applied to the movement of any commodities moving in large volume, such as coal, the only effect in the long run would be to work the extinction of the smaller dealers and place the business of the country in the hands of large distributors. The application must be dismissed.

To Protect Bottom Flanges of girders over railway tracks from the rapid deterioration due to the chemical action of smoke and gas, together with the erosive effects of engine blasts, it was found, after trying several other devices, that $\frac{3}{8}$ -in. plain oak sheathing held firmly in place by iron clamps, the sheathing being first covered on its upper side by a paste composed of red lead and Portland cement, was very satisfactory. As stated by L. M. Hastings, city engineer of Cambridge, Mass., the oak sheathing showed surprising resistance to the destructive action of the blast. Some pieces of oak taken from the bridge after 10 or 12 years exposure showed a loss of thickness of not more than $\frac{1}{4}$ in.

Tank Cars for Canadian Northern Railway.

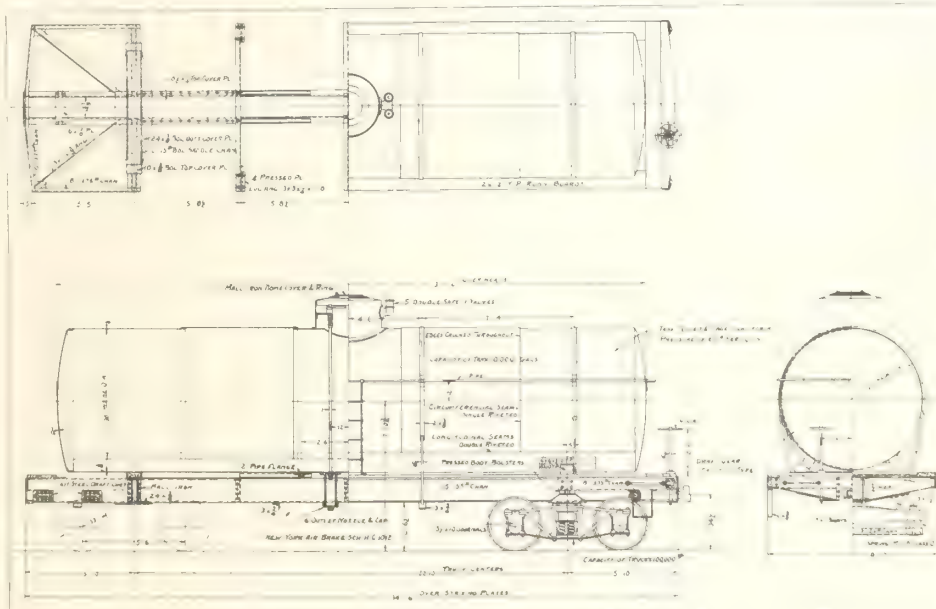
The C.N.R. has received recently, from the United States, 4 tank cars, nos. 7161 to 7164, of which the following are the principal particulars:—

Length over striking plates.....34 ft. 6 ins.
Width over side sill channels.....8 ft. 10 ins.
Diameter of tank inside.....90 ins.
Length of tank over heads.....31 ft. 2 ins.
Height top of rail to centre of tank.....7 ft. 10 $\frac{3}{16}$ ins.
Truck centres.....22 ft. 10 ins.
Truck wheel base.....5 ft. 6 ins.
Truck wheels.....33 ins. diameter, 725 lbs. each
Axles.....5 $\frac{1}{2}$ x 10 ins., MCB journal
Capacity.....10,000 U.S. gallons

The centre construction consists of two 15 in. 55 lb. rolled steel channels, spaced 12 $\frac{7}{8}$ in. apart, running continuous from end sill to end sill and reinforced on top by two cover plates 20 $\frac{1}{2}$ in. x $\frac{1}{4}$ in. running from bolster saddle to anchor. The end sills are formed from 8 in. 13.75 lb. rolled steel channels, with flanges facing inward, connecting at the corner through $\frac{5}{8}$ in. gusset plate, forming a tie for the 3 x 3 x $\frac{3}{8}$ in. rolled steel diagonal brace

The tank proper is made up of 5 circumferential sheets of $\frac{1}{4}$ in. plate and 1 bottom sheet of $\frac{3}{8}$ in. plate. Longitudinal seams are double rivetted and circumferential seams single rivetted. The dome is fitted with malleable iron cover, and ring $\frac{5}{8}$ in. double safety valves. The base of the tank is also provided with 6 in. outlet nozzle and cap. Sill steps formed from 2 x $\frac{3}{8}$ in. steel are provided and located according to Interstate Commerce Commission requirements. The draft gear is of friction type, the air brakes, New York schedule H-C, 1012. The trucks are of 50 tons capacity, having top bars 4 $\frac{1}{2}$ x 1 $\frac{1}{2}$, bottom bars 4 $\frac{1}{2}$ x 1 $\frac{3}{8}$ and tie-bar 4 $\frac{1}{4}$ x $\frac{5}{8}$. Wheels are 33 in. diameter, 725 lbs. each. The bolsters are fitted with class D, M.C.B. springs.

Each end of tank is provided with a head 7/16 in. thick, flanged and dished and single rivetted to shell. The dome sheet is of $\frac{1}{4}$ in. plate flanged and single rivetted. The dome head of $\frac{1}{4}$ in. plate is



Canadian Northern Railway Tank Car.

and side sill, the latter being of the same section as the end sill.

The bolster construction consists of two pressed steel diaphragms formed from $\frac{1}{4}$ in. plate and tied, at the bottom by a plate 24 x $\frac{3}{8}$ in., at the top by a plate 10 x $\frac{3}{8}$ in. The two tank saddles consist of 10 x 15 lb. rolled steel channels, located with flanges facing upward and having yellow pine filler to suit contour of tank. The four bottom anchors for tank, extending between the outside and centre crossties, are formed from 3 x 3 x $\frac{1}{2}$ in. U-shaped bracings. The three crossties, one being located at the centre of the frame, the others being spaced 5 x 8 $\frac{1}{2}$ in. each side of centre, consisting of $\frac{1}{4}$ in. steel plate pressings, and are connected to the side sill with 3 x 3 x $\frac{1}{4}$ in. angle plate. The running bars consist of 2 x 12 in. yellow pine and hand rails are provided 12 in. above the centre line of the tank, formed from 1 in. pipe. The end sill is reinforced at striking plate by a steel plate $\frac{3}{4}$ in. thick. The bolster is reinforced between centre sills by a malleable iron filler. Four hold down straps, formed from 2 x $\frac{3}{8}$ in. steel bars, terminating in 1 $\frac{1}{4}$ in. rods, are provided and located each side of centre of tank and 7 ft. 4 in. centre to centre of outside straps.

flanged and dished and single rivetted to dome sheet. The 5 in. double safety valve is rivetted directly to the dome sheet, and the tank outlet nozzle is fitted with valve and operating rod, valve being operated from dome with a malleable iron can. The tanks are tested before erection to 60 lbs. pressure per square inch, all seams being caulked.

Canadian Ticket Agents' Association.

The next annual meeting and outing will be held at Port Arthur, Ont., June 12. The party will start from Sarnia by Northern Navigation Co.'s steamship, returning by Canadian Pacific steamship to Port McNicoll.

Public Ownership of Public Utilities.

The Royal Commission on the high cost of living, in its report presented recently, advocates public ownership of all public utilities, including electric railways, water, gas and electric light in cities and towns.

The Montreal Warehousing Co.'s annual meeting was held at Montreal, Mar. 1.

The directors for the current year are E. J. Chamberlin, President; H. G. Kelley, Vice President; J. E. Dalrymple, Frank Scott and John Pullen. The Manager and Secretary is C. J. Smith.

Spring Track Work.

By J. W. Powers, Supervisor, New York Central Railroad.

With the advent of spring come many of the hardships of trackmen. The roadway, having passed through the rigors of winter, is frequently in a condition which requires vigorous and immediate attention. As the frost leaves the ground, the heaving often goes out in an irregular manner and shimmed track must be watched closely in order to avoid accident. This is particularly true where there are shims on curves, as any settlement which will effect the elevation must have prompt attention. Thick shims should be removed gradually as the frost leaves the ground. When necessary thin shims should be substituted until the track resumes its permanent position. The necessity of shimming is due to insufficient or poor ballast or drainage. Such points should be located and steps taken to eliminate the necessity of shimming.

During this season of the year, some roads are troubled with bank slides. Such slides sometimes occur in cuts, filling in ditches and burying the track. In some cases the embankment of the road will crumble away to such an extent as to endanger the safety of traffic. The magnitude of such slides depends on circumstances and varies from a few yards to landslides which interrupt traffic for several days, requiring service of steam shovel or ditcher to remove. In connection with land slides, washouts have to be contended with, as they usually occur at this season of the year, causing more or less damage, due to heavy rains together with melting snow. It is remarkable how quickly a flood of water under certain conditions can destroy the works of man. Embankments and bridges which required considerable labor and skill extending over years, perhaps only to be washed away in a few hours or minutes, showing how little man's efforts mean when attacked by natural forces. It also shows the necessity that in order to make our work of a permanent character, we must plan it so that it will not conflict with the unchangeable laws of nature.

While some washouts cannot be prevented by the efforts of trackmen, when the forces of nature combine to produce unusual volumes of water without adequate avenues of escape, there are, however, a great many washouts which can easily be averted if proper precautions are taken. Thus by keeping the ditches and waterways open, removing rubbish from under bridges and cleaning out culverts as often as obstructions may gather there, observant foremen can save the company many expensive washouts, which shows that safety of trains depends to a large extent upon the degree of energy, intelligence and integrity displayed by trackmen.

The most important regular work of the spring season is the renewal of ties, which should be taken in hand as soon as roadbed is in condition for it. The constantly increasing cost of new and suitable cross ties, coupled with their ever growing scarcity, makes it imperative that trackmen should handle the track question with the greatest circumspection and care, hence facts tending to reduce waste in this direction should be encouraged, as our timber resources are no longer boundless.

The best method of putting in ties is one of vital importance, but on account of the widely diverse conditions existing

on many roads, it is apparent that but few general remarks are applicable to all. A matter of great importance in the renewal of ties is to determine what ones should be taken out or just what ties, if left in another year, would by further decay weaken the track to such an extent as to be detrimental. Several weak ties should not be left together, the ties on curves should be inspected very closely and decayed ones should not be allowed to remain in curved track. A tie on a tangent will sometimes last much longer than on curves, thus a tie may be safe for one year in one place where it would not be safe in another. This means that the inspector when he condemns ties to be renewed must exercise good and clear judgment and should not injure good ties when testing for renewals. But it is false economy to allow ties to remain in track that are not sound enough to support the rail properly, for ties not furnishing their proportion of rail support increase the load on the adjacent ties and cause excessive rail cutting and rough riding track. Similar defects will be caused by new ties if not put in properly. The roadmaster or supervisor or their assistants should examine all ties which are to be removed, so that no good ones will be taken out, as many ties have to be prematurely removed from track on account of injuries inflicted upon them during renewals. Still more injury is done by not plugging spike holes, as an unplugged or improperly plugged spike hole in a tie is by far the quickest road to its destruction, as it acts as an easy avenue for the absorption of water, which very thoroughly permeates throughout the body of the tie. Great care should be used when putting in new ties. Much can be done during the process of renewal to shorten or lengthen the life of the tie. Tie tongs should be used to pull new ties in track and men should not be allowed to use picks for this purpose as the holes left by the picks will make an easy place for water to lodge. Neither should they be placed heart side up as this accelerates the destruction of the tie by the converging fibres. If placed heart side down, the fibres of the timber tend to shed water away from the inner timber.

The renewal of ties naturally causes disturbance in the general condition of the track that cannot be immediately corrected, therefore the old bed should not be disturbed unless it is absolutely necessary. In order to reduce the period of such disturbance to a minimum, the renewals should be carried on without interruption. It has been a matter of much discussion whether it is best to put the final surface on track as ties are renewed, or put in ties and leave track in fairly good condition in order to expedite the work of renewals. Both methods have very strong adherents and arguments to sustain them, but the most logical conclusion is that conditions govern as to which is the best course to pursue on any particular road. Where the old ties to be removed and the new ones to be installed are of different dimensions, much time can be saved by using new ties about the same sizes as the old ones, and if old ties were properly spaced it helps to keep the spacing uniform. To obtain the best results, ties should be of the same length and of uniform cross section. With perfectly uniform ties laid at right

angles to the track and evenly spaced, the maintenance expenses would, undoubtedly, be greatly decreased without incurring any heavier expense in the first cost of ties.

The necessity for using appliances and adopting methods of economy and efficiency in these days of sharp competition and adverse railway legislation must be apparent to all officers who are responsible for the expenses in their respective departments. With this idea in view, the maintenance of way departments are economizing by a more liberal use of chemically treated ties with tie plates. The necessity of properly constructed tie plates has become more and more apparent. With the increase in weight of motive power, carloads and speed of trains, the demand for good ties, chemically treated, is increasing as the forest supply decreases and prices advance. The life of a tie is shortened by two principal causes, that is by the chemical process of decay and the mechanical wear under the rail. The life of some ties can be doubled and trebled by proper chemical treatment. Yet this would by no means solve the tie question unless provision is made to prevent the rail from wearing away the tie. It is a fact that many ties are removed from track, not because of decay, but on account of being weakened by rail base cutting into the wood. A properly constructed tie plate will increase the life of the tie, decrease the cost of tie renewals, maintain the rails in their normal positions, prevent excessive wear on the side head of rail, affect a large saving in the labor of track maintenance and increase safety in operation.

There is a diversity of opinion among track men as to the economy and efficiency of using a bevel tie plate. If such plates were used on every tie, we believe they would give good results. But we all know that after an ordinary rail has lain in track for a period of time, it is not the same shape nor has it the same bearing on ties as when it was first laid, because the wheel loads passing over it have canted it to a certain extent. Opinions vary as to the practicability of their use in rails adjoining frogs and switches. If bevel plates are not placed on all ties, the rail bears on such plates only on the outside of the base of the rail, which places it in torsion and tends to cause half moon breaks. Therefore all of these things have to be considered and properly adjusted or else we have an imperfect device.

There is one feature which should be observed in all kinds of track work and that is the safety of trains and men. This forms the main part of a trackman's responsibility and attention has been called to it so often that it would seem unnecessary to do so again. Still, we believe that we cannot be reminded too often of the necessity of using extra precautions for the protection of the traveling public, our fellow workmen and ourselves. Safety of the track is all important, but we must have intelligent safety or safety that is not wasteful either in labor or material.—Maintenance of Way Bulletin.

M. E. McLeod has been appointed agent, Canadian Ex. Co., Prince George, B.C., vice A. Sholey, who has resumed his former position as messenger.

Birthdays of Transportation Men in April.

F. G. Adams, Commercial Agent, G.T.R., and Division Freight Agent, G. T. Pacific Ry., Winnipeg, born at St. John's, Nfld., Apr. 6, 1878.

W. H. Ardley, Comptroller, G.T.R., G. T. Pacific Ry., Montreal, born at London, Eng., Apr. 24, 1858.

Jas. Black, Freight Claim Agent, C.P.R., Vancouver, B.C., born near Seaforth, Ont., Apr. 19, 1858.

C. G. Bowker, General Superintendent Eastern Lines, G.T.R., Montreal, born at Medford, N.J., Apr. 21, 1871.

A. V. Collins, Canada Steamship Lines, Ltd., Toronto, born at Island Pond, Vt., Apr. 21, 1868.

R. J. Collins, Chief Dispatcher, District 4, Alberta Division, C.P.R., Edmonton, born at Winnipeg, Apr. 30, 1883.

Sir Henry L. Drayton, K.C., Chief Railway Commissioner for Canada, Ottawa, Ont., born at Kingston, Ont., Apr. 27, 1869.

A. E. Edmonds, General Agent, C.P.R., Detroit, Mich., born at Woodstock, Ont., Apr. 8, 1866.

B. C. Gesner, Moncton, N.B., formerly Air Brake Inspector, I.R.C., now Eastern Sales Agent, Galena Signal Oil Co., born at Cornwallis, N.S., April 23, 1859.

J. Murray Gibbon, General Publicity Agent, C.P.R., Montreal, born at Ude-wella, Ceylon, Apr. 12, 1875.

V. A. Harshaw, Assistant Superintendent, District 3, Eastern Division, C.P.R., Montreal, born at Mono, Ont., Apr. 26, 1865.

J. M. Horn, Assistant General Freight Agent, Canadian Northern Ry., Winnipeg, born at Allanton Mills, Lanarkshire, Scotland, Apr. 12, 1880.

B. S. Jenkins, ex General Superintendent, C.P.R. Telegraphs, Winnipeg, born Apr. 8, 1859.

J. H. Johnston, Superintendent of Bridges and Buildings, Eastern Lines, G.T.R., Montreal, born at Uxbridge, Ont., Apr. 22, 1866.

G. W. Lee, Commissioner, Timiskaming and Northern Ontario Ry., North Bay, Ont., born at Renfrew, Ont., Apr. 15, 1871.

J. A. Macgregor, Superintendent, District 4, Alberta Division, C.P.R., Edmonton, born at Dufftown, Scotland, Apr. 5, 1873.

B. R. Marsales, District Freight Agent, Canadian Northern Ry., Calgary, Alta., born at Guelph, Ont., Apr. 13, 1887.

J. H. Mills, Master Mechanic, Lake Superior Division, C.P.R., North Bay, Ont., born at Sherbrooke, Que., Apr. 23, 1865.

P. Mooney, General Freight and Passenger Agent, Halifax and South Western Ry., Halifax, N.S., born at St. Catherines, Que., April 19, 1871.

F. L. Nason, General Agent, Passenger Department, C.P.R., San Francisco, Cal., born at Newton, N.H., Apr. 16, 1880.

G. D. Perry, General Manager, Great North Western Telegraph Co., Toronto, born at Whitby, Ont., April 19, 1858.

R. A. Pyne, Superintendent of Shops, C.P.R., Winnipeg, born at Toronto, April 10, 1874.

R. S. Richardson, Superintendent, District 3, National Transcontinental Ry., Fort William, Ont., born at Napanee, Ont., April 9, 1865.

F. Rioux, Assistant to President, Reid Newfoundland Co., St. John's, Nfld., born at Trois Pistoles, Que., April 18, 1867.

W. A. Ritchie, District Superintendent, Pullman Co., Montreal, born at Edinburgh, Scotland, Apr. 13, 1854.

E. W. Smith, Superintendent, Dining and Parlor Car Service, G.T.R., Toronto, born at North Bridge, Mass., Apr. 21, 1869.

G. St. George Sproule, Engineer of Tests, C.P.R., Montreal, born there, Apr. 23, 1885.

W. S. Tilston, Chief of Montreal Board of Trade Transportation Bureau, born at Manchester, Eng., Apr. 14, 1877.

C. H. Towle, Assistant Superintendent, District 1, Atlantic Division, C.P.R., Brownville Jct., Me., born at Enfield, Me., Apr. 13, 1878.

E. D. Toye, Storekeeper, Ontario Division, Canadian Northern Ry., Trenton, born at Dalston, Ont., Apr. 27, 1891.

H. J. White, Supervisor of Car Work, Eastern Lines, Canadian Northern Ry., Toronto, born at Brownington, Vt., Apr. 1, 1871.

E. M. Wood, Deputy Municipal and Railway Commissioner for Manitoba, born at Brantford, Ont., Apr. 20, 1858.

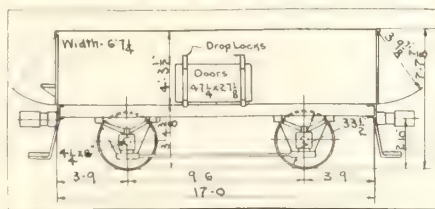
W. Woollatt, Vice President and General Manager, Essex Terminal Ry., Walkerville, Ont., born at Weedon, Hertfordshire, Eng., Apr. 2, 1855.

Freight Cars for Nigerian Railways.

As announced in Canadian Railway and Marine World for January, the Nigerian Ry. in West Africa ordered through the Crown Agents for the Colonies, from Canadian Car & Foundry Co. 100 ten-ton, end tipping coal cars. As they are being built to a typical design of European equipment, so much of which is now being built in Canada, a description of them will be of general interest. The principal dimensions are as follows:

Length over end sills and top frame.....	17 ft. 0 ins.
Length of rigid wheelbase.....	9 ft. 6 ins.
Width over wooden siding.....	7 ft. 0 ins.
Width inside.....	6 ft. 7 1/4 ins.
Height, top of rail to side sill.....	3 ft. 4 3/8 ins.
Height, top of rail to top of side.....	7 ft. 7 1/2 ins.
Height, top of rail to centre of coupler.....	2 ft. 10 ins.
Centre to centre of journals.....	5 ft. 4 ins.
Cubical capacity.....	440 cu. ft.
Capacity.....	10 tons (2240 lbs. each)
Diameter of wheels.....	33 1/2 ins.
Size of journal.....	4 1/4 x 8 ins.

The framing throughout is of composite construction, embodying the use of 2 1/2 in. wooden flooring, 2 3/8 in. thick wooden ends and sides secured to a metal



Nigerian Railway Freight Car.

underframe. The 8 in. rolled steel side sills proper are set back to suit the location of the pedestals, brackets being secured to take the 2 1/2 x 5 in. rolled steel, angle auxiliary, side sill member, with its short leg placed parallel to the outside face of the siding. The main draft members are of 3 1/2 x 8 in. rolled steel, section tied to the end sills by U shaped plates and secured to the bolster by angle plates. Two large hinged end doors 6 ft. 6 3/4 ins. long are located as shown by the accompanying illustration. Two body bolsters located 2 1/2 ft. each side from centre of car are provided and secured by top cover plates. The end sills are of 12 in. rolled steel channel section, being tied at the centre by channel braces secured to the

centre sills. The draft gear consists chiefly in the use of an A. B. C. automatic coupler fitted with a set of coil springs, the round shank of the coupler passing through same and secured at the back by double nuts. The springs are formed in two units, one located in front of the end sill to take buffing shock, and the other placed behind it, taking pulling strains. The brake gear is controlled from a hand screw located at diagonal corners at end of car, and operates a bell crank, secured to a centre cross shaft which connects to the brake shoes and forces them against the treads of the wheels. Very little shoe clearance is provided and the necessary power can be applied from either end of the car. The trucks are of the 4 wheel rigid wheelbase type, with pedestals secured directly to the side sills, having the 7 leaf, semi-elliptic equalizer springs located immediately in front, and resting in a bearing secured to the lower flange of the side sill. The journal boxes are of the double bolted cover type, having equalizer spring seats, and single pedestal jaws fitted to them, the whole being tied at the bottom by through braces. The necessary safety appliances, door locks, brake hangers and guides are provided, and the cars in general have a very neat and serviceable appearance. They are to be shipped with underframe in one package, and the sides and ends crated.

Lights for Cars or Locomotives Obstructing Main Tracks.

The Board of Railway Commissioners passed the following general order 159, Feb. 18: Re application of Brotherhood of Locomotive Engineers and Brotherhood of Locomotive Firemen and Enginemen for an order prohibiting railway companies from placing and leaving cars on main tracks at any point (in yards or otherwise) on any railway during the hours of darkness, without lights placed upon such cars. Upon reading what is filed in support of the application and on behalf of the railway companies, and the report and recommendation of the Board's Chief Operating Officer, it is ordered that the following be added to rule 93 of the train rules designated as the Uniform Code for Canadian Railways, approved by order 7563, July 12, 1909, viz. 'By night or in foggy or stormy weather proper lights must be placed on cars or engines obstructing main tracks within yard limits.'

Track Laid.—The Toronto Globe says: "The amount of new track laid in any calendar year, not being a matter to which the Government statisticians devote attention, is always the subject of controversy. There is more than ordinary diversity of opinion this year, but the statistics just compiled by the Canadian Railway and Marine World would seem to be conclusive. Acton Burrows reports a total new mileage of 714.26 miles, which, while considerably below any one year for the past 12 years, is in excess of estimates at the beginning of 1915."

Freight Bills.—The Interstate Commerce Commission has decided at Washington, that freight bills presented to the ultimate consignees of shipments re-consigned in transit ought not to disclose the name of the original consignors; neither should they show the original point of shipment nor the route of movement to the reconsigning point except in instances where the ultimate consignee is required to pay the through charges.

Tests of British Columbia Ties in England.

The table in the left hand column of this page gives results of experiments made in England by the Great Eastern Ry., to ascertain the resistance to depression and rupture, under a gradually in-

creased thrusting stress, of specimens prepared from samples of timber received from the British Columbia Lands Department's Forest Branch.

The table below shows tensile tests.

Test No.	Description (Specimens prepared from samples 10 x 5 in., 3 ft. long.)	Dimensions.		Ultimate Strength.		Remarks.
		Size. inches.	Area. sq. in.	Total lbs.	Per square inch. lbs.	
2738	Baltic Timber	1.99 x 0.99	1.97	11,180	5,680	Fracture rather short.
2739		1.99 x 1.00	1.99	11,500	5,780	
2742	Douglas Fir	1.98 x 1.00	1.98	23,800	12,000	Jagged fracture.
2743		2.00 x 0.99	1.98	21,600	10,900	Jagged fracture.
2746	Red Cedar	2.00 x 1.00	2.00	5,720	2,860	Short fracture.
2747		1.99 x 1.00	1.99	7,440	3,740	Jagged fracture.

Acceptance of Shipments of Explosives from Canadian Northern Ry.

The Assistant Chief Commissioner, Board of Railway Commissioners, D'Arcy Scott, has given the following decision, which has been concurred in by the Chief Commissioner and Commissioners McLean, Nantel and Goodeve:

The Canadian Pacific and Grand Trunk Railways have given notice to the Canadian Northern that in future they will decline to accept shipments of explosives from the latter. This action was brought about by the Canadian Northern refusing to maintain its membership in the American Railway Association's Bureau for the Safe Transportation of Explosives and Other Dangerous Articles. For the Canadian Northern lines in Ontario, I understand it would cost about \$500 a year for membership in the Bureau. The Canadian Northern says that the National Explosives Ltd., of Deseronto, is the only explosive factory exclusively on its line in Ontario. Manufacturers of explosives are permitted to become members of the Bureau of Explosives. If the National Explosives Ltd. joined the bureau, the other railway companies would not refuse shipments from the explosive company originating on the Canadian Northern; or, if the Canadian Northern became a member of the bureau, no shipment originating on its line would be refused by other railways. The question is, whether under present conditions the Canadian Pacific and the Grand Trunk would be justified in refusing shipment of explosives originating on the Canadian Northern.

Sec. 286 of the Railway Act provides that a railway company shall not be required to carry explosives, but, if it decides to carry them they can only be carried if the regulations for the transportation of explosives prescribed by the Board, by general order 100, are complied with. Clause (b) of these regulations provides that explosives "may be received for transportation, provided the following regulations are complied with, and provided their method of manufacture and packing, so far as it affects safe transportation, is open to inspection by a duly authorized representative of the initial carrier, or of the Bureau of the Safe Transportation of Explosives and Other Dangerous Articles of the American Association if it be so designated by the Canadian carrier. Shipments of ex-

plosives that do not comply with these regulations must not be received. There is nothing in the regulations which makes it obligatory for the Canadian Northern to join the Bureau. If the Canadian Northern will appoint a competent inspector to visit the factory of the shippers of explosives and he makes sure that the Board's regulations are followed, the railway company may receive the shipment and carry it over its railway.

Sec. 317 of the Railway Act, s.s.3 (b) provides that: "No company shall, by any unreasonable delay or otherwise however, make any difference in treatment in the receiving, loading, forwarding, unloading, or delivery of the goods of a similar character in favor of or against any particular person, or company." As it is admitted that the Grand Trunk and Canadian Pacific carry some explosives they are bound by the provisions of the Railway Act, just quoted, to carry all explosives tendered to them for transportation provided the Board's regulations respecting same have been followed. Unless they have good ground to doubt its bona fides, a certificate of the initial carrier should be sufficient evidence for the Grand Trunk or the Canadian Pacific that the Board's regulations have been followed.

An order directing the Canadian Pacific and the Grand Trunk to receive shipments of explosives from the Canadian Northern will not issue until the latter has satisfied the Board that it has appointed a competent inspector and made proper arrangements for the inspection of shipments of explosives originating on its line.

Satisfactory Movement of Western Grain.—At the Canadian Credit Men's Association annual meeting in Toronto recently, General Manager Detchon of Winnipeg said: "In reference to the criticism of transportation facilities for moving the crops last fall, I wish to say that there is no reason for criticizing the railways. The crops were so immense that they could not move them. Why, even today I can show you elevators filled to the brim with the golden wheat, and around the elevators have been constructed temporary cribs, filled to the top and overflowing."

The G.T.R. is suing the Pere Marquette Rd. for \$16,506.32 for the use of the G.T.R. station at London, Ont., from Jan. 1, 1909, to June 30, 1915.

Railway Mechanical Methods and Devices.

Boring Chime Whistles at Grand Trunk Shops.

Boring the central hole in chime whistles is performed in the G.T.R. shops at Stratford, Ont., in the drill press, holding the whistle in a special jig, which is shown in the accompanying illustration. The jig is an iron casting, machined only

to act as a shear for severing the sprue. The lid is free to move laterally on its hinges, and after the metal is poured and set, the handle, on the inner end of which there is a cam, is given a partial turn, the cam bearing against the cover plate, moving it to the left, cutting off the sprue. The cover is then raised, the air cylinder actuated, raising the ring from the mould.

illustration was developed during a time when it was necessary to find some ready relief as regards caring for steam heat hose bands during bad weather, and the dimensions relate to a device principally for this style of band. It is also just as applicable for use with air brake and signal hose bands, which are of smaller size. The base is formed from an old drawbar follower plate and the lever may be



Jig for Boring Chime Whistles.

on the under side, for bearing on the drill press table. It is of odd shape, consisting essentially of a cylindrical block with two projecting arms for bolting down on the table. Through the centre, there is a drilled hole for aligning, the upper part of the hole where cored being larger than the drilled section. On one side of the cored cavity is a segmental cavity, and on the upper surface are two segmental block projections, of different heights, the cavity and projections forming the bearings for the steps of the whistle, also preventing the whistle from turning in the jig without bolting down.

The jig is set up on the table centrally, aligning with the central hole. The whistle is set in the jig, in the drill run down through the cored hole in the base of the whistle, which is upside down in the jig. This method has been found to be materially quicker than the older method of boring out in the lathe. The jig, from its simplicity, was not costly, requiring only the making of a pattern.

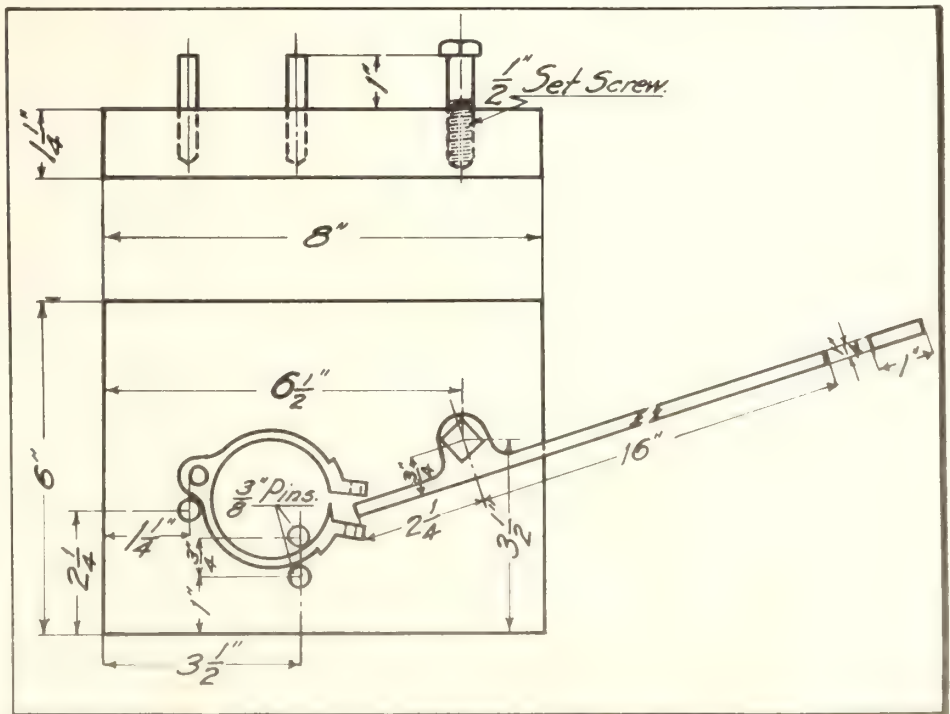
Casting Valve Gland Packing Rings in Grand Trunk Shops.

The practice in casting valve gland packing rings in the G.T.R. shops, at Stratford, Ont., is shown in the accompanying illustration. The combination die which is used will make any of 15 different sizes. It consists essentially of two die plates, in the lower one of which, at A, there are the die cavities, lined up with which over top, there are the pouring holes coming directly over the sides of the rings, all contained in the plate B. Each of the holes in plate A has a stripper plunger, which contains the form of the inner and bottom faces of the ring, as shown; all these stripper plungers being attached to a plate C, which is operated by the air cylinder D, beneath the mounting table. The hinged cover plate B is lowered on the die plate, and clamped there, and the metal poured through the desired pour hole. Each of these pour holes has a tempered steel bushing,

Hose Band Opener, Canadian Northern Ry.

Hose mounting and dismounting operations are carried on at practically all terminal points and there is a great dif-

ference in the time involved for such work, directly proportional, in almost every instance, to the efficiency of the devices and designs of machines used for the purpose. During the winter a great deal more work of this kind is carried on than in the warmer season, as steam heat hose, in conjunction with regular air brake and signal equipment, has to be maintained.



Hose Band Opener, Canadian Northern Railway

The device shown in the accompanying

securely to a bench before being used. We are indebted to T. Clegg, Air Brake Foreman, Canadian Northern Ry., Winnipeg, for this information.

Windsor, Ont., ratepayers passed a by-law, Mar. 5, to expend \$1,500 for the purchase of a lot to provide railway sidings for the Maxwell Motor Co., of Detroit, Mich., which is establishing a plant in Windsor.

Interchange of Traffic with Canadian Northern Railway at North Bay.

The Canadian Northern applied to the Board of Railway Commissioners recently, under secs. 317 and 334 of the Railway Act, for an order directing the Grand Trunk to interchange freight traffic with it on an equality with the Canadian Pacific. The Chief Commissioner, Sir Henry Drayton, gave the following judgment, Mar. 9:

This application was heard in Ottawa, Jan. 25, F. H. Phippen, K.C., appearing for the Canadian Northern, and W. C. Chisholm, K.C., for the Grand Trunk. The questions involved are of great importance to the companies interested, the Grand Trunk being particularly desirous of maintaining its traffic connections afforded by the Timiskaming & Northern Ontario from North Bay to Cochrane, by the National Transcontinental from Cochrane to Winnipeg, and the Grand Trunk Pacific from Winnipeg west; and, apart from any other consideration, the Grand Trunk is, of course, interested, and vitally interested, in the future of the Grand Trunk Pacific. On the other hand, the Canadian Northern is equally interested in transferring freight to Grand Trunk points in Ontario at such a point as will enable it to get the benefit of the long haul on the traffic that it originates, and to obtain its share of the benefit of Grand Trunk construction in Ontario, and to be able to compete with other western carriers for traffic originating on Grand Trunk lines in that district.

The Section particularly relied on by Mr. Phippen is 317, and in particular ss. 1, 2 and 4. They read as follows:—

"All companies shall, according to their respective powers, afford to all persons and companies all reasonable and proper facilities for the receiving, forwarding and delivering of traffic upon and from their several railways, for the interchange of traffic between their respective railways, and for the return of rolling stock."

"2. Such facilities to be so afforded shall include the due and reasonable receiving, forwarding and delivering by the company, at the request of any other company, of through traffic, and, in the case of goods shipped by car load, of the car with the goods shipped therein, to and from the railway of such other company, at a through rate; and also the due and reasonable receiving, forwarding and delivering by the company, at the request of any person interested in through traffic, of such traffic and through rates."

"4. Every company which has or works a railway forming part of a continuous line with, or which intersects any other railway, or which has any terminus, station or wharf near to any terminus, station or wharf of any other railway, shall afford all due and reasonable facilities for delivering to such other railway, or for receiving from and forwarding by its railway, all the traffic arriving by such other railway without any unreasonable delay, and without any such preference or advantage, or prejudice or disadvantage as aforesaid, and so that no obstruction is offered to the public desirous of using such railways as a continuous line of communication, and so that all reasonable accommodation, by means of the railways of the several companies, is, at all times, afforded to the public in that behalf."

And counsel contends that the mere fact that North Bay is the terminus of the Grand Trunk makes the statute absolutely applicable and entitles the Canadian Northern to an order as asked, as a matter of strict right.

Mr. Chisholm argues that where there are satisfactory joint rates and joint routes in existence, no other route should be ordered against the protests of a participating carrier, or at the instance of a company which desires resultant greater revenue. He attacks the financial stability of the Canadian Northern, relying on the action of the Interstate Commerce Commission in declining to force railway companies to have traffic relations with other railways whose stability they did not recognize; and relies on the Board's

decision in the case of the Great Northern against the Canadian Northern, 11 C.R.C., pg. 425. The result of Mr. Chisholm's objections is that the interests of the public must be established before any effect can be given to the application.

The submissions of the Quaker Oats Co. showed that the shortage of grain at Peterborough from which they were suffering was ample justification to require the acceptance of Canadian Northern traffic by the Grand Trunk. Order 24698 was, therefore, made at the hearing, directing the Grand Trunk to concur in joint freight tariffs which were to be forthwith published and filed by the Canadian Northern, applicable on grain and grain products in carloads from Port Arthur, Fort William, and Westfort to Grand Trunk stations via North Bay. A direction was also made that the joint rates were to be the same as those published and filed by the Canadian Pacific from points of shipment to the same destinations, and the grain to be carried was to be accorded milling in transit privileges pertaining to shipments received by the Grand Trunk from the Canadian Pacific. Mr. Chisholm desired the opportunity of taking the question up with the National Transcontinental and the Temiskaming & Northern Ontario Railways; and judgment was reserved on the general issue.

No public interest was established at the hearing in any movement except that of grain and grain products from the west to the east, with the result that the main question, as presented for consideration, is supported by the requirements and interests of the Canadian Northern itself. Interchange tracks exist between the Canadian Northern and the Grand Trunk Pacific, the connecting carrier of the Grand Trunk, at different points west of Winnipeg. None of these need be considered. There are also interchange tracks in Winnipeg and Fort William. The Grand Trunk itself can interchange traffic at North Bay through the Timiskaming & Northern Ontario's interchange tracks. There are also interchange tracks available to the Grand Trunk and Canadian Northern at James Bay Jet., and different points in Southern Ontario which are not necessary at mention. So far as the facilities for interchange are concerned, no issue is now raised. The question is as to extending their use and the publication of joint tariffs which will render the movement possible.

An application involving somewhat similar principles was the Muskoka Rates Case. The application there was made by the Canadian Northern against the Grand Trunk and Canadian Pacific, and was made under the same sections as those here invoked. The application there was an application compelling the Grand Trunk and Canadian Pacific to issue through tickets at through rates from all points on their lines to all points on the Canadian Northern by any junction the passenger wished to take. The underlying reason of the application was the fact that much of the Muskoka business came through Buffalo and points west of Toronto. The Canadian Northern had a line serving the Muskoka district, but, being without any western connections, had no opportunity of obtaining any of the Muskoka business originating west of Toronto. The late Chief Commissioner Mabey, in his judgment dismissing the application in so far as traffic having its

origin at Grand Trunk and Canadian Pacific points was concerned, said:

"It does not seem to be a reasonable proposition that one railway company should be at liberty to use the act for the purpose of diverting to its line traffic that has been originated only at great expense and trouble by another railway or other railways, without at least showing a great preponderance of convenience to the public. It must be borne in mind that this application comes from the railway company, and no evidence was given that any inconvenience was being caused to the public from existing conditions, or that there would be any appreciable advantage to the public if the change asked for was granted; and that the change would be for the pecuniary benefit of the applicant railway company is not of itself any sufficient reason for granting the application. Under sec. 317, the facilities to be afforded are to be reasonable; the preference or advantage that would be given, or the delay or difference in treatment that may be permitted, is not to be unreasonable; so it is apparent that the whole section is intended to provide for the establishment of fair and reasonable business relations. Is it fair that the applicant should be permitted to make use of the act to divert from the Grand Trunk and Canadian Pacific at Toronto the tourist traffic that they have spent years in developing? That this would be to the advantage of the applicant is clear, but it has not been shown that the public is to any appreciable extent interested. I agree with the argument of the applicant that the physical situation of the railways falls within subsec. 4; but it has not been shown that any obstruction is offered to the public desirous of using such railways as a continuous line of communication. I do not agree with the contention that existing conditions must be changed merely because a few and inconsiderable number of people might desire to change at Toronto to the applicant's lines; and I cannot regard it as reasonable or proper that railways should, in the application of this section, be put to serious loss and inconvenience when it is apparent that the rail object of the application is not to offer greater facilities to the public, but to enhance the earning power of the applicant's lines."

This authority was followed by the Board in the Fort William Coal Case and its principles applied, the Board there stating that its powers under the Railway Act should not be used to divert traffic from the lines of one company to those of another without any benefit to the public. Mr. Phippen distinguishes the coal case, on the ground that no revenue to the Grand Trunk would be sacrificed, this being the terminus of its line. While this in one sense is undoubtedly true, as it occurs to me, the statute makes no difference as to the duties of the companies to provide facilities and joint routes at terminal points as against other points on their systems proper for that purpose. In any event, however, the effect of these decisions, establishing as they do the manner in which the Board in the past has construed the statute, is entirely against the contention advanced on behalf of the applicant that the terms of the statute itself compel railway companies to afford to all persons and companies at all points where an interchange is capable of being made, interchange facilities and joint rates covering any possible movement that might be made over the interchange.

It is, of course, obvious that if the Board could refuse an application under the section because the objecting company would lose revenue thereby, that the application could be refused on other grounds and that the question is one requiring the exercise of the Board's judicial and discretionary functions. It would not be just to the Canadian Northern to refuse the present application, or to carry the principles on which the Muskoka rates and Fort William coal cases were adjudicated to their logical conclusions. There are other questions which must be considered. The rule established by Board's decisions that the initiating company is entitled to the benefit of the long haul would be entirely disregarded

if the application was dismissed in so far as the Canadian Northern is concerned. The effect would be that the Canadian Northern would be obliged to hand over to the National Transcontinental at Winnipeg, or to the Canadian Pacific at Port Arthur, all traffic originating on its lines in the west destined to Grand Trunk Ontario points intermediate to the transfer tracks at Toronto. The business of the Canadian Northern is entitled to just as much consideration as that of the Grand Trunk.

It is necessary for the Board, however, to determine some principle on which these interchange tracks and through rates are to proceed. The statute calls for reasonable and proper facilities for the interchange of traffic and for the return of rolling stock. With the large amount of regrettable duplication of railways, it certainly would not be either reasonable or proper that such interchange tracks, involving reasonable or proper that such interchange tracks, not only for construction but also for maintenance and operation, should be installed at every point possible; and, if joint rates had to be filed as and when such possible interchange tracks were put in, the only result would be to absurdly duplicate tariffs and add to the cost of railway operation without any resultant benefit to traffic conditions. North Bay is a point at which the Grand Trunk should interchange traffic with the Canadian Northern. It is also a point of interchange calling for the establishment of joint rates, bearing in mind the general principle that the initiating carrier is entitled to the long haul on its lines, subject to the limitation, which will be rigidly enforced, that the resultant joint route is reasonable and practical and involves no back haul or increased cost to the public. It occurs to me that in considering the matter of haul, the Grand Trunk and Ontario and Dominion Government lines should be considered as one route.

No formal direction should now be made as to the exact principles on which the joint rates are to be put in. The parties must have an opportunity of making any submissions they desire upon that point; and, in case the bases of division and territories are not agreed to within a fortnight, a hearing will be had at the request of either of the parties to the issue, and the matter determined. So far as divisions are concerned, the Canadian Northern offered to accept the existing divisions between the Grand Trunk, Timiskaming & Northern Ontario and National Transcontinental. This offer would seem to me to be fair and should be adopted unless sufficient cause to the contrary is shown.

A Snow Plough's Adventures.—During the recent heavy snow storms in the west, when considerable trouble was experienced in keeping certain of the railway tracks clear, M. Donaldson, vice President and General Manager, Grand Trunk Pacific, who had had his private car attached to a Canadian Northern eastern bound train, was held up near the Yellowhead Pass, on account of the snow. To help matters, he had one of the G.T.P.R. wing snow ploughs transferred to the C.N.R. tracks, at a point where the two lines run parallel. During the operation of clearing the snow, the plough jumped the track and turned turtle on the G.T.P. tracks about 100 ft. below, where it caught fire from the stove carried on board, everything being destroyed but the metal work.

Railway Finance, Meetings, Etc.

Algoma Central & Hudson Bay Ry.—

A general meeting of shareholders was called to be held at Sault Ste. Marie, Ont., Mar. 23, to consider a scheme of arrangement between the company and its creditors, and steps taken to have the scheme approved by the Exchequer Court, also to approve an application by the receivers and managers for parliamentary sanction of the scheme proposed.

Canadian Northern Ontario Ry.—

There has been deposited with the Secretary of State at Ottawa, duplicate original of an additional mortgage, dated Dec. 20, 1915, made between the C.N.O. Ry., the British Empire Trust Co., and the National Trust Co., as trustees, covering certain shares and bonds deposited with the trustees of a trust deed, dated June 28, 1909, made to secure certain 4% perpetual consolidated debenture stock and bonds.

Greater Winnipeg Water District Ry.—

The report of the Commissioners of the Greater Winnipeg Water District, laid before a meeting on Feb. 25, gave the following information respecting the operations of its railway from near St. Boniface to Shoal Lake, 90 miles: Passengers carried 13,875; freight carried 349,204,159 lbs., of which 27,391,433 lbs. did not produce any revenue; gross revenue \$147,028.88. After paying operating expenses, and charging interest on cost of construction there was an apparent operating loss of \$21,000. The Commissioners expressed the opinion that this was a good showing, and it was stated that the revenue from the train service had increased so as to cover the cost of operation.

Michigan Central Rd.—There has been deposited with the Secretary of State at Ottawa, copy of a lease dated Jan 15, made between the Philadelphia Trust Co., and the M.C.R., relating to the Michigan Central Rd. Equipment Trust of 1915.

Pere Marquette Rd.—The sale of this line, which has been in the receivers' hands for several years, has been postponed by the United States District Court at Detroit, Mich., until July 5.

Spokane and British Columbia Ry.—

The officers for the current year are: President and Treasurer, W. T. Beck, Republic, Wash.; Vice President and General Manager, F. M. Holland, Toronto; Secretary, M. Allyn, Republic, Wash.; Superintendent, W. H. Kirkpatrick, Grand Forks, B.C. Connections are made with the Kettle Valley Ry. at the International Boundary, and with the Great Northern Ry. at Republic.

Temiscouata Ry.—Net earnings for Dec. 1915, \$4,797, and for six months ended Dec. 31, 1915, \$21,595.

Timiskaming and Northern Ontario Ry.—The Treasurer of Ontario stated in the Legislature recently, that the railway's net income for the last year was \$330,000, and of its electric subsidiary the Nipissing Central Ry., \$25,000, of which the commissioners had paid \$250,000 into the Treasury. He looked forward to the time when the railway would meet its annual interest of \$800,000.

White Pass and Yukon Route. Gross earnings for January, \$9,220, against \$6,275 for Jan. 1915.

C.P.R. Employees on the Western Lines enlisted in the Canadian Overseas Forces to Feb. 29, numbered 2,336.

Campbellford, Lake Ontario and Western Ry. Construction Suit.

The judicial committee of the Imperial Privy Council gave judgment recently in the case of Cook v Deeks, etc. This suit which has aroused a good deal of attention in contracting and railway circles, arose in connection with the contract for the construction of the Campbellford, Lake Ontario & Western Ry., otherwise known as the C.P.R.'s Lake Ontario Shore Line Branch, which was commenced in 1912, and amounted to considerably over \$5,000,000.

A. B. Cook, G. S. Deeks, T. R. Hinds and G. M. Deeks had for some years prior to 1912 been associated, as Toronto Construction Company, Ltd., in railway construction and had carried out several important contracts. When, however, the contract for the Shore Line came into the market, Deeks, Hinds and Deeks formed the project of securing it for themselves, to the exclusion of Mr. Cook. This project they successfully carried out, while still maintaining their apparent association with Cook and their position as directors in Toronto Construction Co., keeping Cook in the dark as to the course of events until the coup was accomplished. On learning the facts, Cook protested vigorously, but in vain, his former associates asserting their legal right to do as they had done. Hence the litigation. Cook's action met with no success at the trial, was dismissed by Judge Middleton in May 1914, and the Court of Appeal for Ontario, confirmed that decision. The Privy Council has now allowed his appeal and has ruled, in effect, that his former associates must admit him to a share of the profits of the Shore Line contract.

Progress of Rogers Pass Tunnel Construction.

The following table, for which we are indebted to J. G. Sullivan, M.Can.Soc.C.E., Chief Engineer, C.P.R., Winnipeg, shows the progress made from Jan. 27 to Feb. 26, and the total progress to Feb. 26:—

EAST END—		Progress.	Total.
Main tunnel	603 ft.	10,151 ft.	
WEST END—			
Main tunnel	619 ft.	8,868 ft.	

The main tunnel faces, at Feb. 26, were 7,381 ft. or 1.4 miles apart.

A railway land damage question.—An interesting point in connection with the expropriation of land for railway construction purposes is before the Ontario courts in Lake Erie & Northern Ry. vs. J. W. Lee. The arbitrators granted Lee \$6,785 for 5 acres taken from a farm near Simcoe and the company appealed against this figure. The matter was argued before the Court of Appeal in Toronto, Mar. 16, and judgment was reserved. The company when incorporated was given power by the Dominion Parliament to use either steam or electricity as a motive power, and during the survey and construction stage it was generally understood that electricity would be the power, although it was not definitely decided until the middle of 1915. It was argued on behalf of the railway company that the difference between the value of the farm without the railway, and its value with the railway should be the measure of damage. In other places farms had been increased in value owing to the building of an electric railway.

Railway Development, Projected Lines, Surveys, Construction, Betterments, Etc.

Athabasca & Fort Vermilion Ry.—We are officially advised that while preparations have been going on to complete final arrangements for the building of this railway from Athabasca Landing, Alta., to Fort Vermilion, 330 miles, it has been decided to postpone actual construction until the spring of 1917.

Canada Western Ry.—The Dominion Parliament has extended the time for the building of this projected railway from Winnipeg, northwesterly via Yorkton, Saskatoon and Battleford to Edmonton, Alta. (Feb., pg. 48.)

Canadian Pacific Ry.—Tenders are under consideration for the supply of labor and material to complete all work in connection with paving the approaches to the freight sheds at Regina, Sask.; for the excavation of a reservoir above the dam at Moose Jaw, Sask., and for the building of standard 2 stations at Admiral, Scotsguard, and Meyvonne on the Shaunavon subdivision, Sask.

The Calgary & Edmonton Ry. has been granted an extension of time by the Dominion Parliament for the building of the following lines: From its Macleod Branch in Tps. 19, 20 and 21 westerly to the south branch of Sheep Creek, range 4, west of the 5th meridian; a branch to the north branch of Sheep Creek in range 2, 3 or 4 west of the 5th meridian, and a second branch to Trap Creek in range 2, 3 or 4 west of the 5th meridian, Alta. (Mar., pg. 91.)

Canton & Grand Lake Ry.—The New Brunswick Legislature is being asked to incorporate a company with this title to build a railway from Canton, Sunbury County, to Syphers Cove, Queen's County, and to extend the same to Gagetown on the St. John & Quebec Ry. The object is to develop coal mines and other resources. J. S. Armstrong, solicitor for applicants.

Essex Terminal Ry.—The Ontario Legislature is being asked to ratify a by-law passed by the Windsor City Council, granting a right of way and other rights to the company. The city, under the provisions of an Act of 1907, was authorized to grant or lease lands for manufacturing sites by way of bonus or aid to industries. In order to make these sites available, the council entered into an agreement with the E.T.R., to lay tracks, sidings, etc., on such lands, and certain tracks and sidings were laid. The bylaw confirms the grant of the right of way to the company, and such future right of way as may be arranged for, the grant to continue so long as the lands are used for the purpose granted; that all material used for the construction of the lines shall be purchased in Canada, and that the city shall obtain the confirmation of the bylaw and pay all costs incidental to the same. The plan dated April 1, 1914, made by Owen McKay, Chief Engineer, E.T.R., is declared to form part of the bylaw. (Feb., pg. 49.)

Grand Trunk Ry.—A press report states that construction was started Mar. 20, on a new wharf and dock at Sarnia, Ont., to be 850 ft. long, and built on a pile foundation.

Another report says that the company proposes to build large new freight sheds at Point Edward, Ont., for the Port Huron & Duluth Steamship Line, the sheds to be

1,200 ft. long, but we are officially advised that no decision has been arrived at. The report adds that a new grain elevator will also be built at Point Edward this year. (Mar., pg. 106.)

High River & Hudson Bay Ry.—The Alberta Legislature is being asked to extend the time for the building of this projected railway east and west from High River. This project is connected with that of the High River, Saskatchewan & Hudson Bay Ry., and the promoters are also interested in the Calgary & Fernie Ry., for both of which Dominion charters are in existence. (Mar., pg. 106.)

Intercolonial Ry.—The acting Minister of Railways, replying to questions in the House of Commons, Feb. 24, said the Blue River M. & L. Co., of Riviere Blue, Temiscouata County, Que., received the permission and support of the Department of Railways for the building of a spur line to its mill. The company agreed to pay the cost of the perishable material and labor furnished by the railway and an annual rental on the rails and fastenings, the railway to make a refund of the cost of perishable material and labor at the rate of \$2 a car on all cars loaded by others than the company since the siding was constructed, and until the railway provides its own facilities at this point. The Department had not been advised that the company was charging exorbitant rates for the use of its facilities, but investigation was being made as to the rates being charged to lumber merchants and colonists.

Senator Loughheed, replying to questions in the Senate recently, said the cost of the subway under Main St., Moncton, N.B., was \$106,960.27, exclusive of property damage claims not yet settled. The contractors were Soper & McDougall, Ltd., Ottawa, and Rhodes, Curry & Co., Ltd., Amherst, N.S., the work being done at schedule prices. (Mar., pg. 106.)

Lake Huron & Northern Ontario Ry.—Replying to a question in the Ontario Legislature Mar. 7, the Minister of Lands said the Lieutenant Governor had not issued a proclamation bringing into force the Act passed last session of the Legislature, granting the company an extension of time for proceeding with the construction of the projected extension of its railway from Rock Lake, Algoma, the present terminus, to a junction with the National Transcontinental Ry., between Hearst and Cochrane, Ont. (Sept., 1915, pg. 341.)

National Transcontinental Ry.—The citizens of Port Arthur, Ont., have sent a largely signed petition to the Dominion Government, asking that the Lake Superior branch, which is leased by the Department of Railways from the Grand Trunk Pacific, be extended from its present terminus in Fort William, Ont., into Port Arthur. (Dec., 1915, pg. 470.)

Ontario Niagara Connecting Bridge Co.—The incorporation of a company with this title is being asked from the Dominion Parliament, with E. R. Wood, Toronto; R. P. Slater, Niagara Falls, Ont.; A. Fraser, F. A. Dudley, E. Shepard, A. J. Porter, Niagara Falls, N.Y.; W. E. B. McKenzie, Chippewa, Ont., and E. G. Connette, President International Ry., Buffalo, N.Y., as provisional directors; office at Niagara Falls, and a capital

of \$300,000. Parliament is asked to authorize the construction of a railway and general traffic bridge with approaches and terminal facilities, across the Niagara River, starting from the Ontario bank at some point not more than 6,000 ft. north of the intersection of the northern boundary line of Welland County with the river bank. No work is to be done upon the bridge or terminals until the plans have been filed with the Railways Department and approved by the Governor in Council; and the works and plans shall in no way interfere with the construction and operation of the low level railway, which the Commissioners of the Queen Victoria Niagara Falls Park has power to build. The Board of Railway Commissioners is to have power to decide what area of land may be required for this purpose. Subject to the provisions of the Railway Act, the company may unite with a company formed under New York State or United States laws for the purpose of building the bridge, and operating any railways crossing it. The company is authorized to issue bonds for \$2,000,000, and may join with the U.S. company in issuing \$4,000,000 of bonds for construction purposes. The bridge is to be begun within two years and completed in five years. Power is given to other railways having terminals in Niagara Falls to use the bridge on terms to be fixed by the Board of Railway Commissioners. (Jan., pg. 11.)

Pacific Great Eastern Ry.—The Premier of British Columbia announced recently that while the Government did not propose to grant any further aid towards the construction of the Vancouver-Prince George section, the Legislature would be asked to approve of the granting of a short term loan on suitable security. The line between Squamish and Prince George, he said, was approximately 80% completed, and construction was closed down because it was impossible for the company or the contractors to secure further funds. The proceeds of the company's guaranteed securities sold prior to the outbreak of war had been exhausted; the unsold securities had been pledged to secure advances and the contractors had also secured advances from the banks on their own resources. It was estimated that it would require \$6,500,000 additional to complete the line and put it in operation. (Mar., pg. 107.)

Peace River Tramway & Navigation Co.—Vancouver, B.C., press dispatch, Feb. 22: "A syndicate of British capitalists, of which Lord Rhondda (D. A. Thomas), the Welsh coal baron, is head, has acquired the Peace River Trading & Land Co., in northern Alberta and the Peace River districts. The Peace River Tramway & Navigation Co., with which the Thomas interests are also prominently identified, is preparing the right of way for the portage line to be built at Vermilion Falls as a unit of transportation system that will provide navigation facilities over 200 miles on northern waterways."

Peace River Tramway & Navigation Co.—We are officially advised that the right of way for the tramway over the portage at Peace River Falls, Alta., six miles, is being cleared. It is in the immediate vicinity of the company's oil drilling operations which were discontinued in Oct., 1915. Oil drilling will be re-

sumed, it is expected, about May 1. The interests associated with the company have acquired the entire assets of the Peace River Trading & Lands Co. from the liquidators, consisting of trading posts and stores at Peace River Crossing, Fort Vermilion, and Lake Saskatoon, warehouses, boat landings and property holdings. The new owners propose to prosecute the development of this business, of which Mr. Sinclair, of Peace River Crossing, has been appointed Manager. (Jan., pg. 11.)

See also Athabasca & Fort Vermilion Ry.

Prince Edward Island Ry.—Replying to questions in the Senate recently, Senator Loughheed said A. T. Mackie, Toronto, had the contract for the terminals at Cape Tormentine, N.B., at schedule rates, estimated to amount to \$571,590.56; and that Roger Miller & Sons, Toronto, had the contract for the Carleton Point, P.E. I., terminals at schedule prices, estimated to amount to \$949,250. (Oct., 1915, pg. 352.)

Quebec Central Ry.—The Quebec Legislature has extended the time for building the Chaudiere extension, which now terminates at English Lake, Que., to a junction with the Temiscouata Ry. (Feb., pg. 50.)

Quebec, Montreal & Southern Ry.—The Dominion Parliament has extended the time for the building of the projected line from Noyan Jct., Que., to the International Boundary, and for the completion of any unfinished line which the old South Shore Ry. was authorized to build. This uncompleted line is that projected along the south shore of the St. Lawrence River, which has its present terminus near St. Francis du Lac. (Jan., pg. 11.)

Roberval-Saguenay Ry.—The Quebec Legislature has extended the time for the building of this projected railway from Roberval, on the Quebec & Lake St. John Ry., round Lake St. John to the Peribonka River, and thence southeasterly to Jonquieres, on the Q. & L. St. J. R., for the completion of the lines authorized to be built by the Ha Ha Bay Ry., and for a line to the St. Maurice River. (Dec., 1915, pg. 470.)

St. Francis Valley Ry.—The Quebec Legislature has extended the time for the building of this projected railway. The company has secured the charter of the L'Avenir & Melbourne Ry., which had power to build a line from Richmond or Melbourne to Drummondville, and has power under its own charter to build a line to the International Boundary near Stanstead. (Feb., pg. 50.)

St. John & Quebec Ry.—The speech from the throne at the opening of the New Brunswick Legislature, Mar. 9, said legislation would be presented providing for the early completion of this railway, and ensuring not only direct connection with the east and west sides of St. John harbor, but, as well, an independent route from that city to the New England States and a new channel for the export of the forest production of central and northern New Brunswick. Referring to this statement, a press report says it is proposed that a spur line will be built to form a connection between the St. J. & Q. R. and the Maine Central Rd.

Replying to a question in the House of Commons, Mar. 6, the acting Minister of Railways said a new arrangement between the Department and the Province of New Brunswick respecting the St. J. & Q. R. has been under discussion for some time, but the negotiations were not completed. The question asked was based

on a press report that an arrangement had been made not to build any further than the present northern terminus at Centreville; to abandon the building of the proposed bridges across the St. John and Kennebecasis Rivers, and to make a connection with the C.P.R. tracks at Westfield, N.B. (Jan., pg. 11.)

Taber Transit Co.—The Alberta Legislature is being asked to extend the time for the building of a series of radial railways centering on Taber, to give connection with collieries in the vicinity; the C.P.R. Suffield branch, and with Bow City. No construction has yet been undertaken. (June, 1915, pg. 212.)

Toronto, Hamilton & Buffalo Ry.—It was reported, Mar. 9, that the company had acquired the Albion Hotel property,

Hunter St., Hamilton, thus giving it possession of all the property south of the tracks between Macnab and John Sts., with the exception of one piece opposite the station. The report adds that it is proposed to build a modern station on the site of the present building, and to utilize the land acquired for additional trackage. (Feb., pg. 50.)

Toronto Terminals Ry. Co.—George Bury, Vice President, C.P.R., while in Toronto, Mar. 10, went over the site of the new union station. He is reported to have said in an interview that the caissons had been sunk, and that the concrete work was being rushed in order to have the foundations in readiness for starting steel work early in April. (Jan., pg. 11.)

Railway Rolling Stock Notes.

The G.T.R. is reported to have ordered 2 postal cars in the United States.

Sir John C. Eaton, Toronto, has ordered a private car from the Pullman Co., Chicago.

The Canadian Northern Ry., between Feb. 11 and Mar. 11, received 2 first class passenger cars, nos. 8219 and 8220, from National Steel Car Co.

The Minister of Railways stated in the House of Commons recently, that the purchasing of additional cars for the Canadian Government Railways was under consideration.

Canadian Government Railways have ordered one high power self propelling steel track pile driver, for use on the National Transcontinental, from F. H. Hopkins and Co.

The Canadian Locomotive Co. has shipped 10 decapod locomotives for the Russian Government. Description and illustration have already appeared in Canadian Railway and Marine World.

The French Government, according to a press report, has ordered 2,000 additional steel freight cars from National Steel Car Co., Hamilton, Ont., which is said to have already built about 5,000 similar cars for that government.

The Eastern Car Co. has delivered at Halifax, for shipment to Russia, 175 freight cars of an order of 2,000, which has been mentioned in previous issues. The company has also completed the sample car of the lot of 1,000 cars for the French State Railways.

The Canadian Northern sleeping car Virginia is being changed in the company's Winnipeg shops to an official car, to be called Ontario, for L. C. Fritch, General Manager, Eastern Lines, whose present official car, Quebec, will probably be transferred to the Quebec Division for the General Superintendent, W. A. Kingsland.

The Canadian Northern private car Atikokan, which is used by the President, Sir Wm. Mackenzie, is being rebuilt at the company's Winnipeg shops, and Sir William is at present using the all steel private car Natalie, which was formerly used by the late F. S. Pearson, as President of the Denver & Salt Lake Rd., and which was built by the Pullman Co. in 1913 and was lettered "300."

The Lake Erie and Northern Ry. has received final deliveries, from the Preston Car and Coach Co., of its order for rolling stock, comprising 4 full passenger motor cars, 2 combination passenger and baggage motor cars, and 2 trailer cars of the same type as the full passenger cars. These have already been described

and illustrated in Canadian Railway and Marine World.

The Timiskaming and Northern Ontario Ry. has ordered 6 mikado (2-8-2) locomotives from Canadian Locomotive Co., for delivery in July. Following are the chief details:

Weight in working order on drivers.....	188,000 lbs.
Weight, total.....	246,000 lbs.
Wheel base of engine, rigid.....	16 ft. 6 ins.
Wheel base of engine, total.....	34 ft. 8 ins.
Wheel base of engine and tender.....	63 ft. 4½ ins.
Heating surface, firebox.....	208 sq. ft.
Heating surface, tubes.....	3,162 sq. ft.
Heating surface, total.....	3,370 sq. ft.
Driving wheels, diam.....	63 ins.
Driving wheels, centres.....	cast steel
Driving journals, diam. and length.....	10 and 9 by 14 ins.

Cylinders, diam. and stroke.....	25 by 30 ins.
Boiler, type.....	radial stay
Boiler pressure.....	180 lbs.
Tubes, no. and diam.....	216—2 ins.; 32—5½ ins.
Tubes, length.....	20 ft.
Injectors.....	locomotive type
Brakes.....	Westinghouse American E. T.
Packing.....	Metallic
Superheater.....	Locomotive Superheater Co., Type A
Rear frame.....	Cast steel cradle
Engine frame, and springs.....	Vanadium steel
Weight of tender, loaded.....	143,000 lbs.
Tank capacity.....	7,000 U.S. Gals.
Coal capacity.....	12 tons
Truck, type.....	outside equalized
Wheels, diam.....	36 ins.
Wheels, type.....	Steel tired with retaining rings
Journal, diam. and length.....	5½ by 10 ins.
Brake beam.....	Hercules with adjustable heads

In our last issue mention was made that the French Government had ordered 2,000 freight cars from the Eastern Car Co. They are intended for the Paris and Orleans Ry., and will be of the 4 wheeled type with Paris and Orleans Ry. standard pedestals and leaf elliptic springs, and drawbar and buffer arrangements with standard volute springs, standard hand brake separated from the cabin on one end of the car. They will be box cars, with one door on each side with bottom rollers, and shutter windows on each side. Following are the chief dimensions:

Capacity.....	20 metric tons
Length inside.....	25 ft. 0 7/16 ins.
Width.....	8 ft. 4¾ ins.
Height.....	6 ft. 8 11/16 ins.

The C.P.R. has ordered 20 all steel Otis dump cars, 50 tons capacity, from Hart-Otis Car Co., Ltd., for delivery in June. They are being built by Canadian Car & Foundry Co. Following are the chief details:

Length over end sills.....	24 ft. 4½ ins.
Width over side sills.....	9 ft. 11¼ ins.
Width inside.....	9 ft. 6 ins.
Length inside.....	22 ft. 6 ins.
Height inside.....	5 ft. 6 ins.
Doors, on each side.....	24 by 2 ins. by 22 ft.
Door openings.....	24 by 2 ins. by 22 ft.
Air brakes.....	Westinghouse K.D. 11
Draft springs.....	M.C.B., Class G
Truck.....	Standard
Journal boxes.....	McCord mall. iron, 5½ by 10 ins.
Truck bolsters.....	Simplex, 60 tons.
Side bearings.....	Susemihl
Brake beams.....	Standard
Brake shoes.....	Doninion Brakeshoe Co., steel back

Relief of Grain Congestion in Goose Lake District.

An act passed by the House of Commons and Senate was assented to Mar. 7, by which the following section was added to the Railway Act:

"317A. If the company is unable or fails to provide sufficient facilities for the movement of grain from the western provinces to the elevators at the head of Lake Superior, or to destinations east thereof, after the close of navigation on the Great Lakes and before the next harvest, and grain in certain sections or districts cannot by reason thereof be marketed, the Board (of Railway Commissioners) may require the said company to furnish all facilities within its powers for the carriage of such grain in such sections or districts to any intermediate point or points of interchange with another company or any terminal elevator, and there to make delivery thereof to such other company or companies or to such elevator for carriage by such other company or companies as the Board may direct; and the Board may require such other company or companies to transport such grain and supply the necessary cars and engines therefor, and the rates lawfully published and filed by the company in default and obtaining on its route shall apply over the joint route or routes so directed and shall be apportioned between the companies as the Board may direct."

The Board of Railway Commissioners' Action.

Sir Henry Drayton, Chief Railway Commissioner, gave the following decision Mar. 4: The Board is advised that bill 47, as passed by the House of Commons, Mar. 1, has been adopted in the Senate without amendment. The duty is cast upon the Board, in view of the admitted congestion in the Goose Lake district, to take immediate action under it. There is no issue whatever which requires the taking of evidence or the consideration of any submissions as to the facts. In co-operation with the Grain Board, the Railway Board has had the question of the movement of grain up with the different railways from time to time.

The first complaint as to the situation in the Goose Lake district was made in October, and the matter was then taken up by the Board's Inspector with Messrs. Murphy and Brown, of the Canadian Northern, and, on Nov. 6, Mr. MacLeod, the General Manager, was telegraphed that at that time the elevators were already filled, if not to capacity, and his personal attention and distribution of cars was required. On Nov. 8, Mr. MacLeod wired that he expected to send in the next 24 hours 250 empty box cars to Goose Lake points; and on Nov. 9, he was advised that, while that supply would help the situation, from the information on hand it would take more than that to really catch up, and that particular attention should be given to the demands of the district, owing to the fact that storage capacity had been practically all taken up, leaving an immense amount of grain which at that time could neither be stored nor forwarded. On Nov. 15, the Board's Inspector advised that the Canadian Northern had supplied in the district in question from Nov. 8 to 13, inclusive, 204 cars, leaving, however, still a shortage in the district of 1,500 cars. The Board's Inspector continued to press for a larger delivery.

The Board sent its Chief Operating

Officer, Mr. Spencer, to the west, with instructions to see that everything was done that possibly could be done by the railways to facilitate the movement both of empty and of loaded cars. Early in January the line was blocked by snow, and the haulage of wheat practically stopped. As it became necessary for the Board to concentrate its whole energy in seeing that districts in the west, many of which were suffering from an acute shortage of coal, should be supplied with it at the earliest possible moment, considerable time was lost in connection with this matter. Weather conditions were very unfavorable, the extreme cold occasioning a scarcity of water along the whole line, and rendering it very difficult to get any proper service from locomotives. In addition to local difficulties, the situation was further complicated by embargoes, which largely obtained from time to time practically at all United States ports from which grain could be exported, and to a limited extent to movements to St. John, N.B. While in the West, Mr. Spencer took up with Mr. Warren, Assistant to the General Manager, C.N.R., the question of the amount of grain which the company had yet to handle. The figures given by Mr. Warden to Mr. Spencer applicable to the Goose Lake district, which includes not only the line from Saskatoon to Calgary, but also the Delisle-Elrose Branch, show that the company estimated that 13,000,000 bush. of wheat and 2,000,000 bush. of other grain remained still to be hauled from the district. Mr. Warren's estimate showed that the grand total of grain yet to be hauled by the Company amounted to 89,000,000 bush. In response to a wire as to the situation in this connection, General Manager MacLeod wired the Board on Feb. 15 that wheat shipments had been made since the estimate so as to reduce the amount of wheat still left in the district to 11,732,000 bush., and 1,945,000 bush. of other grain, or a total of 13,677,000 bush. of grain in the Goose Lake district requiring transportation.

I am of the opinion that the company did its best to move the crop during the past season. It gave the Goose Lake district every consideration that it could, bearing in mind the demands of other districts served by its system. It can do no better now, and it is doubtful if it can do as well. The company's estimate was confirmed by the Secretary of the Saskatoon Board of Trade, who, at the commencement of the movement, wrote drawing the Board's attention to the situation in the Goose Lake district, and who since advised that a conservative estimate of grain still to be hauled out of the district would amount to 60% of the crop. The Grain Commission's attitude is entirely to the same effect. Indeed its figures as to the grain available somewhat exceed the company's. The fact of congestion and danger of deterioration and loss of grain has also been endorsed by the Minister of Agriculture for Saskatchewan, and by a deputation of those interested in the district, headed by Mr. McColl, of Chinook, subsequently reinforced by the Minister of Agriculture for Alberta, and Mr. Buchanan, M.P.

No useful object can be served by an inquiry, resulting as it would in delays and defeating the object of the Bill. The company admits the situation. There can be, and is, no doubt as to it or its urgency.

An order should now go carrying into effect the recent legislation, and requiring the C.N.R. to forthwith place 1,200 grain cars in the Goose Lake district and 36 locomotives. These cars and locomotives must be retained in that district until further order, and be employed in carrying grain either to the terminal elevator at Saskatoon and there making deliveries, or to transfer tracks at Saskatoon, whereby connection is made between the Canadian Northern and Grand Trunk Pacific lines. The order will also require the Grand Trunk Pacific, which has idle cars and locomotives in the west, to use all available cars and locomotives in taking grain from the Saskatoon elevator to eastern points. In so far as deliveries are made by the Canadian Northern into the elevator, there is no difficulty whatever in the company keeping those cars in the districts and immediately returning them. In so far as deliveries are made to transfer tracks, the Grand Trunk Pacific must, in return for each car transferred, supply the Canadian Northern an empty box car in lieu thereof, so that at least 1,200 grain cars will be at all times engaged in the movement. As already intimated, the movement will continue until further order. This order will not go until such time as the Grain Commission advises that there is no longer danger of loss of unstored and unprotected grain in the district, or until such time as the Saskatoon elevator has been filled and the Grand Trunk Pacific is unable to remove from the transfer tracks grain carried by the Canadian Northern from the district. The companies are required to agree as to the proportionals of the rate, which must not be increased. The proportionals should be such as will give the Canadian Northern an increase over the ordinary rate per mile which a pro rata on the through movement would yield over the Canadian Northern mileage into Saskatoon. These proportions are to be agreed to within a week; and, in the absence of agreements arrived at between the parties by that time, will be then settled by the Board on such advice and submissions as either Railway Company desires in the meantime to submit.

The Board of Railway Commissioners passed the following order, 24,784, Mar. 9: Upon its appearing to the Board that the Canadian Northern Ry. is unable in the ordinary course to move the quantity of grain awaiting transportation in the Goose Lake district with reasonable dispatch, within such time as will enable a large quantity of unstored grain to be moved before serious deterioration, it is ordered that, until further order, the Canadian Northern be directed forthwith to place and retain in service on its Goose Lake lines not less than 1,200 grain cars and 36 locomotives, to be used in transporting grain from the said district between Saskatoon and Calgary, either to the terminal elevator at Saskatoon for delivery thereto, or to the transfer tracks at Saskatoon for delivery to the Grand Trunk Pacific Ry. for furtherance east, as the said grain may be consigned in either case; and that with respect to deliveries so made to the said transfer tracks, the Grand Trunk Pacific, in return for each loaded car so transferred, supply the Canadian Northern with an empty grain car in lieu thereof, so that at least 1,200 grain cars shall at all times be engaged in the said service of transporta-

tion to Saskatoon. That the Grand Trunk Pacific be directed, in so far as may be necessary, to use all its available cars and locomotives in the west for the purpose of moving the said grain from Saskatoon to eastern points. That the through rates for the joint carriage of the said grain, as herein prescribed, shall be the rates published and filed by the Canadian Northern Railway for the carriage of grain over its own rails, or jointly with its eastern connections as so published, east of Saskatoon, from the said points

of shipment to the same destinations; the allocation of the said joint rates between the carriers hereby made parties thereto to be arranged between themselves within one week from the date of the Board's judgment herein, viz., Mar. 4, and, failing such arrangement, to be settled by the Board, subject to such submissions in relation thereto as either railway company may desire to make, provided that the uninterrupted movement of the said grain be not impaired pending such settlement.

Bonaventure Station, Montreal, Destroyed by Fire.

Fire was discovered in a cupola at the front of the Grand Trunk Bonaventure Station, Montreal, at the front of the building, to the right of the centre, on Mar. 1, at 4.50 a.m., by one of the train dispatching staff, but it had gained such a hold on the inflammable material in the section of the building where records were stored, that when the fire engines arrived there was nothing to do but to keep it, as far as possible, from spreading to adjoining buildings. The isolated posi-

tional, were transferred at St. Henri. Temporary ticket offices for the Intercolonial were opened in G.T.R. ticket booths near Mountain St. The Canadian Express Co.'s shed was untouched. The platform roofs at the rear of the station were undamaged, and temporary buildings have been erected in the vicinity for the transaction of business.

The burned station was a brick building erected in 1886 at a cost of several hundred thousand dollars, and was in its

An investigation into the cause of the fire was concluded Mar. 16 by Fire Commissioner Ritchie, who decided that it was impossible to determine the cause of the fire other than that it was of accidental origin.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, for Western Lines, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$1,206,100	\$921,000	\$285,100	x\$14,100
Aug.	1,192,800	954,000	238,800	x5,000
Sept.	2,014,500	1,358,000	661,600	x1,000
	\$4,413,600	\$3,227,000	\$1,186,600	x\$79,300
Decr.	\$658,300	\$579,000	\$79,300	

Mileage in operation at Sept. 30, 1915, 4,965, against 4,670 at Sept. 30, 1914.

Commencing with October, the figures show the earnings of the entire system, both eastern and western lines.

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
Oct.	\$3,678,500	\$2,421,500	\$1,257,000	x\$1,000
Nov.	3,535,200	2,323,800	1,211,400	x18,000
Dec.	3,435,600	2,233,500	1,202,100	x50,000
Jau.	2,086,800	1,831,400	255,400	x88,000
	\$12,736,100	\$8,810,200	\$3,925,900	x\$1,000
Inc.	\$4,702,300	\$2,667,600	\$2,034,700	

Mileage under operation at Jan. 31, 7,899, against 6,899 at Jan. 31, 1915. Approximate earnings for February, \$2,089,200, against \$1,602,200 for Feb. 1915, and for three weeks ended Mar. 21, \$1,537,200, against \$1,261,500 for same period 1915.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$7,895,375.47	\$5,094,972.35	\$2,800,403.12	\$978,042.71
Aug.	8,801,451.52	5,359,136.80	3,442,314.72	79,157.02
Sept.	10,273,165.45	5,527,864.81	4,745,300.64	378,252.25
Oct.	11,111,206.88	6,801,700.00	4,309,506.88	9,078,007.79
Nov.	13,351,283.51	6,996,870.48	6,354,413.03	3,710,340.86
Dec.	12,705,673.45	7,003,351.97	5,702,321.48	3,502,797.67
	\$57,058,989.88	\$33,344,394.51	\$23,714,595.37	\$10,900,785.81
Inc.	\$2,479,799.10	\$1,529,624.17	\$950,174.93	

Approximate earnings for February, \$8,546,000, against \$6,503,000 for Feb. 1915, and for three weeks ended Mar. 21, \$6,737,000, against \$5,136,000 for same period 1915.

Grand Trunk Railway Earnings.

Following are the earnings and expenses for the G.T.R., Grand Trunk Pacific, Grand Trunk Western, G.T.W.R. and the D.G.H. & M.R., for January, compared with those for January, 1915.

	Grand Trunk Railway, 1916.	1915.
Earnings	2,783,000	2,431,800
Expenses	2,783,000	2,431,800

	Grand Trunk Pacific, 1916.	1915.
Earnings	558,650	588,900
Expenses	558,650	588,900

	Grand Trunk Western, 1916.	1915.
Earnings	\$130,650	\$29,400
Expenses	\$130,650	\$29,400

	Detroit, Grand Haven & Milwaukee Railway, 1916.	1915.
Earnings	1,082,245	301,103
Expenses	1,082,245	301,103

	TRAFFIC RECEIPTS OF THE SYSTEM, 1916.	1915.	Increase
Aggregate from Jan. 1 to Feb. 29, -			
G.T.R.	\$6,437,336	\$5,287,339	\$1,149,997
G.T.W.R.	1,383,708	1,082,245	301,463
D.G.H.&M.R.	474,761	370,874	103,887

	Grand Trunk Pacific, 1916.	1915.	Increase
Aggregate from Jan. 1 to Feb. 29, -			
G.T.P.	\$130,650	\$29,400	\$101,250
G.T.W.	1,082,245	301,103	781,142
D.G.H.&M.	474,761	370,874	103,887

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section, 916 miles, for February, were \$277,619, against \$277,619 for Feb. 1915. Approximate earnings for three weeks ended Feb. 29, \$591,962, against \$422,224 for same period 1915.



Bonaventure Station, Montreal, Grand Trunk Railway.

tion of the fire, and although at one time the buildings on the north side of St. James St., facing the station, were in danger, the flames were confined to the station itself. The interior of the building, which was very largely of wood, was entirely destroyed, together with large quantities of records, etc. Only two people were actually sleeping in the building and were got out easily.

Notwithstanding the fire, there was no interruption of traffic, all trains arriving and departing as usual. Within an hour after the discovery of the extent of the fire new sets of railway tickets had been prepared, and the entire train dispatching system duplicated at St. Henri. Trains arrived at and departed from the station platform at Drummond St., and heated cars were provided as waiting rooms. Passengers arriving for transfer to the Intercolonial or the Delaware & Hudson, which use the G.T.R. ter-day considered a well planned and com-

modious structure, but it has long been out of date and insufficient for the company's purposes. The question of the erection of a new building has been under consideration for some time, and has been coupled with the elevation of the tracks from the station to St. Henri. Under an agreement entered into with the city in 1883, prior to the building of the burned station, the company agreed that the Bonaventure Station should be maintained in "good order for ever," and that in case of fire it should be reconstructed on the same site, and according to the same plan, unless agreed otherwise by the parties to the agreement.

The Montreal Board of Control on Mar. 9, granted the company a permit to erect a temporary station around the ruins. The intention is to roof in the concourse, and to clear out and utilize part of the burned out building. These alterations are for temporary accommodation pending the settlement of plans for a building.

Mainly About Railway People Throughout Canada.

D. Pottinger, I.S.O., ex-General Manager, Canadian Government Railway, and Mrs. Pottinger are staying in Toronto.

G. L. Pearsons has been appointed Secretary-Treasurer and Manager, Goderich Elevator & Transit Co., Ltd., Goderich, Ont., succeeding the late W. L. Horton.

W. L. Mugliston, of the Canadian Overseas Railway Construction Corps, and second son of W. L. Mugliston, late Superintendent of the Midland Ry., of England, died in Flanders, Jan. 30.

T. D. Gray, General Agent, Shedden Forwarding Co., London, Ont., for about 40 years, died there, Mar. 9. He had been connected with the company for over 50 years.

J. S. Pyeatt, who has been elected President, New Orleans, Texas & Mexico Rd., Houston, Tex., was at one time Superintendent, Canadian Division, Pere Marquette Rd., St. Thomas, Ont.

G. A. North, Travelling Passenger Agent, Canadian Northern Ry., Winnipeg, was presented with a wrist watch recently by the department's staff, an enlisting in the 61st Battalion, C.E.F.

F. C. Salter, European Traffic Manager, G.T.R. and Canadian Ex. Co., London, England, is reported to be progressing satisfactorily after a second operation for abdominal trouble.

L. R. Silcox, heretofore chief draughtsman, Mechanical Department, Canadian Northern Ry., Toronto, has been appointed Mechanical Engineer, Illinois Central Rd. Office, Chicago, Ill.

L. B. Howland, of Toronto, formerly President & General Manager, Irondale Bancroft and Ottawa Railway, has been elected President of the Ontario Motor League and of the Canadian Automobile Association.

Lt.-Col. F. S. Meighen, of the 87th Battalion, Canadian Grenadier Guards, now in barracks at St. Johns, Que., who is a C.P.R. director, has been ordered to England to take command of a brigade as Brigadier General.

W. H. Olmstead, yard foreman, G.T.R., died in St. Luke's Hospital there Mar. 19, as the result of injuries received in the yard, Mar. 17, when a box car jumped the track and crushed him between the car and a telegraph post.

G. W. Verral, who for many years conducted the Verral Transfer Co., in Toronto, and has latterly carried on an electric car and cab delivery and the Verral Storage Co., has assigned for his creditors' benefit.

H. K. Wicksteed, M.Can.Soc.C.E., Chief Engineer of Surveys, Mackenzie, Mann & Co., Ltd., left Toronto, Feb. 27, for Venezuela, in connection with a coal mining and railway proposition, intending to return about the middle of April.

Hon. Capt. and Paymaster A. L. Griffin, of the Divisional Train, Army Service Corps, C.E.F., son of F. T. Griffin, formerly Land Commissioner, C.P.R., Winnipeg, died suddenly at Bramshott, Eng., Mar. 26, a week after his arrival there.

Lt.-Col. C. H. Mitchell, B.A.Sc., C.E., of Toronto, who has been on active service with the Canadian Expeditionary Forces in France since the early stages of the war, has been given La Legion d'Honneur Croix d'Officier by the President of the French Republic.

Sir William Van Horne's biography is to be written by Miss Katherine Hughes,

who has come to Montreal from England for that purpose. She wrote a life of the Rev. Father Lacombe, the western Roman Catholic missionary, to which Sir William contributed the introduction.

J. J. Davis, who was second engineer of the s.s. Port Dalhousie, sunk recently off the English coast, was a son of J. J. Davis of the Hotel Davis, Charlottetown, P.E.I., and a son in law of W. T. Huggan, District Passenger Agent, Prince Edward Island Ry., Charlottetown.

Hon. Frank Cochrane, M.P., Minister of Railways and Canals, whose health has been giving some anxiety for some time, has gone south, where he will spend several weeks. **Hon. J. D. Reid**, Minister of Customs, is acting Minister of Railways and Canals.

J. G. Sullivan, Chief Engineer, Western Lines, C.P.R., Winnipeg; **H. N. Ruttan**, Consulting Engineer, Winnipeg, and **R. S. Lea**, Consulting Engineer, Montreal, are mentioned as the probable members of a board to investigate the construction of the Greater Winnipeg Water District aqueduct.

F. E. McCormick, Travelling Freight Agent, Canadian Northern Ry., Winnipeg, died there, Mar. 17. He was born at Waterville, N.Y., Sept. 17, 1891, and entered C.N.R. service in 1908, in the Freight Department, Neepawa, Man., and was later appointed chief clerk, Freight Department, at Brandon, Man.

Baron Shaughnessy's eldest son, **Capt. Hon. W. J. Shaughnessy**, who has been in the 57th Irish Rangers for over a year, has been appointed Adjutant in the 199th Battalion, Canadian Expeditionary Force. The second son, **Capt. Hon. Fred Shaughnessy**, and a son in law, **Rene Redmond**, are in France in the 60th Battalion, C.E.F.

Robert McKillop, who was appointed Superintendent, District 2, Atlantic Division, C.P.R., Woodstock, N.B., recently, was born in Scotland, Dec. 26, 1884, and entered C.P.R. service, July 23, 1905, since when he has been, to Feb. 9, 1915, Assistant Engineer and Chief Draughtsman, Engineering Department, Montreal; Feb. 9 to Dec. 13, 1915, Division Engineer, Eastern Division, Montreal.

J. H. Black, who has resigned as General Manager, Northern Ontario Light and Power Co., Cobalt, Ont., to enter private business in Toronto, was, for seven years, prior to Aug. 1, 1911, in Timiskaming and Northern Ontario Ry. service, occupying positions as General Freight and Passenger Agent, Superintendent and Traffic Manager, and Superintendent, at North Bay, Ont.

Frank O'Hara, Bridge and Building Master, District 4, Eastern Division, C.P.R., Ottawa, died there Mar. 6, aged 52. He was born at Cobourg, Ont., and had been in the C.P.R. service in the Construction and Maintenance Departments since 1885, being appointed Bridge and Building Master at Ottawa 12 years ago. His brother, **T. O'Hara**, is Bridge and Building Master, C.P.R., London, Ont.

Joseph Templeton Hawkins, who has been appointed Freight Claim Agent, Quebec Central Ry., Sherbrooke, Que., was born there, Mar. 26, 1885, and entered Q.C.R. service Nov. 28, 1900, since when he has been, to June 1901, messenger, Sherbrooke; June 1901, to Jan. 1906, stenographer in General Freight and Passenger Agent's office; Jan. 1906,

to Mar. 1, 1916, chief claim clerk, all at Sherbrooke.

Walter M. Taylor, familiarly known as "D" Taylor, who was formerly in the C.P.R. Passenger Department in Toronto and Montreal and afterwards in the International Mercantile Marine Co.'s Montreal office, and who was a sergeant in the 5th Battery, Canadian Expeditionary Force, has returned to his home in Toronto invalided, having lost the sight of one eye owing to a shell wound. His brother, **Geoffrey**, was killed earlier in the war.

Theodore Voorhees, M. Am. Soc. C.E., Vice President of the Philadelphia & Reading Ry., died at Philadelphia, Pa., Mar. 11, following an operation. He entered railway service in 1869, and has held a variety of positions on the Syracuse, Binghamton & New York, now a part of the Delaware, Lackawanna & Western; the Delaware & Hudson; Northern Rd.; Rome, Watertown & Ogdensburg and New York Central. He was born June 4, 1847.

Richard Wright, whose appointment as Division Agent, Ontario Lines, G.T.R., Toronto, was announced in our last issue, was born at London, Ont., March 15, 1885, and entered G.T.R. service, Oct. 17, 1902, since when he has been, to June 1, 1909, clerk in Freight Department, London, Ont.; June 1 to Oct. 15, 1909, freight accountant, London, Ont.; Oct. 15, 1909 to Feb. 7, 1913, chief clerk, Brantford, Ont.; Feb. 7, 1913 to Feb. 1, 1916, agent, Brantford, Ont.

Gifford David Wadsworth, who has been appointed Assistant General Freight and Passenger Agent, Quebec Central Ry., Sherbrooke, Que., was born there, July 15, 1884, and entered Q.C.R. service, Nov. 1899, since when he has been, to Nov. 1900, messenger boy; Nov. 1900 to Nov. 1904, clerk in car record office, and stenographer to Superintendent; Nov. 1904 to Jan. 1906, clerk, General Freight and Passenger Department; Jan. 1906 to Mar. 1916, chief clerk, same department, all at Sherbrooke.

Lt.-Col J. A. Hesketh, M.Can.Soc.C.E., formerly Assistant Engineer, C.P.R., Winnipeg, and District Intelligence Officer and Officer Commanding the Corps of Guides, with headquarters at Winnipeg, who went overseas with the Canadian Expeditionary Force shortly after war broke out, and who is now in Strathcona's Horse, was married in England, Mar. 14, while on leave from the front, to the widow of **J. E. Schwitzer**, who when he died in 1911 was Chief Engineer, C.P.R., Montreal.

O. Swenson, M.Am.Inst.E.E., for the past four years Electrical Engineer, Kansas City Terminal Ry., in charge of all electrical work pertaining to the new union station and terminal facilities, has become a member of the engineering offices of **P. A. Bates**, New York, N.Y. Previous to his work at Kansas City Mr. Swenson was Assistant Electrical Engineer of the Detroit River Tunnel Co. and was engaged on all engineering work in connection with the electrification of the Michigan Central Rd. at Detroit, Mich., and Windsor, Ont.

W. S. Howell, who was appointed Industrial Agent, Chicago, Milwaukee & St. Paul Rd., Chicago, Ill., recently, was born at Port Hope, Ont., July 17, 1867, and educated there. He entered railway service in 1888, as operator, G.T.R., and later entered Union Pacific Rd. service as

dispatcher, remaining with that road, until 1890, when he was appointed Traveling Freight Agent, Chicago, Milwaukee & St. Paul Rd., Omaha, Neb. In 1899 he was appointed General Eastern Agent, same road, New York, and transferred to Chicago, Ill., in 1908, as Assistant General Freight Agent.

George T. Coleman, who was appointed Car Service Agent, Ontario Division, C.P.R., Toronto recently, was born at Carleton Place, Ont., Aug. 25, 1875, and entered C.P.R. service, May 24, 1893, since when he has been, to Dec. 1909, successively, operator, agent, dispatcher, Yardmaster, Night Chief Dispatcher and Trainmaster, at various points on the Eastern and Lake Superior Divisions; Dec. 1909 to Mar. 1914, dispatcher, and Chief Dispatcher, Moose Jaw, and Regina, Sask.; Mar. 1914, to Jan. 1915, Chief Dispatcher, Winnipeg; Jan. 1915, to Jan. 1916, Car Service Agent, Moose Jaw, Sask.

George Carruthers Briggs, who has been appointed Supervisor of Buildings, Eastern Lines, Canadian Northern Ry., Toronto, was born at Cockermouth, Eng., Apr. 23, 1886, and served articles to an architect and surveyor at Workington, Eng., from Mar. 1898 to Mar. 1903. He came to Canada in May 1903, and until Oct. 1906, was engaged in architectural work in Toronto, since when he has been, to Sept. 1912, in draughting office, Engineering Department, Mackenzie, Mann & Co., Toronto; Sept. 1912 to Sept. 1914, Architect, Buildings Department, same company; Sept. 1914 to Feb. 1916, Inspector of Buildings, same company.

W. K. Thompson, who retired as Superintendent, District 3, Ontario Division, C.P.R., Toronto, recently was entertained to dinner there, Mar. 7, by a number of the officials, with whom he had been connected since the early days of the company. Among those present were A. Price, Assistant General Manager, Eastern Lines; G. Ham of the headquarters staff; Angus MacMurchy, Solicitor for Ontario; J. T. Arundel, General Superintendent, Ontario Division; A. L. Hertzberg, Division Engineer; and J. J. Murray, Dominion Express Co. Mr. Thompson was presented with a purse of money, and an easy chair for Mrs. Thompson.

H. P. Borden, M.Can.Soc.C.E., of Montreal, has been appointed a member of the Board of Engineers of the Quebec Bridge, filling the place made vacant by C. C. Schneider's death. Mr. Borden is a graduate of McGill University and for several years was assistant engineer in the C.P.R. bridge department. From 1904 to 1906 he was Assistant Chief Engineer, structural department, Montreal Locomotive Works, Ltd. From then until 1908 he was Structural Engineer of the C.P.R. In 1908 he became Assistant Engineer, Board of Engineers, Quebec Bridge, and for the last three years has been Assistant to the Chief Engineer, C. N. Monsarratt.

F. H. Moody, B.A.Sc., Jr.M.Can.Soc. C.E., Mechanical Editor, Canadian Railway and Marine World, since September 1911, who has been appointed Officer Commanding C Company, 116th Overseas Battalion, Canadian Expeditionary Force, was Lieutenant in the 2nd Queen's Own Rifles of Canada from Mar. 16, 1912, to Mar. 5, 1914, when he joined the reserve corps. During the latter portion of that period he acted as Instructor of Musketry. He was appointed to the 83rd Battalion, C.E.F., in the summer of 1915, and was promoted to Captain in the autumn, and in Jan. 1916 he transferred to the

116th Battalion, and has since been promoted to Major, and is now stationed at Whitby, Ont.

George Stephen, who has been appointed Assistant Freight Traffic Manager, Western Lines, Canadian Northern Ry., Winnipeg, was born at Montreal, July 5, 1876, and entered railway service in 1889, since when he has been, to 1899, clerk in C.P.R. service; 1899, to 1900, chief clerk to Assistant General Freight Agent, C.P.R., Winnipeg; 1900, to 1901, Travelling Freight Agent, C.P.R. lines in Manitoba; 1901, to 1903, Contracting Freight Agent, C.P.R., Nelson, B.C. 1903, to Jan. 1907, chief clerk to General Traffic Manager, Canadian Northern Ry., Winnipeg; Jan. 1907, to May 1909, Assistant General Freight Agent, C.N.R., Winnipeg; May 1909, to March 1916, General Freight Agent, C.N.R., Winnipeg.

H. J. White, who has been appointed General Car Foreman, National Transcontinental Ry., Cochrane, Ont., was born at Brownston, Vt., Apr. 1, 1871, and entered railway service in May 1893, since when he has been, Sept. 1894, car repairer and joint car inspector, Boston & Maine Rd., and C.P.R., Newport, Vt.; Sept. 1894 to May 1900, joint car inspector, C.P.R. and Canada Atlantic Ry., now part of G.T.R., St. Polycarpe Jct., Que.; May 1900 to Feb. 1903, Car Inspector, C.P.R. Toronto; Feb. 1903 to Sept. 1906, leading hand carpenter, C.P.R., Outremont, Que.; Sept. 1906 to May 1911, Car Foreman and Wrecking Foreman, C.P.R., North Bay, Ont.; May 1911 to Nov. 1913, General Foreman, C.P.R., West Toronto, Ont.; Nov. 1913 to Aug. 10, 1915, General Foreman Car Department, Quebec Division, Canadian Northern Ry., Quebec, Que.; Aug. 10, 1915, to Mar. 1916, Supervisor of Car Work, Eastern Lines, C.N.R., Toronto.

Frank Harold Midgley, who was appointed Resident Engineer, Lake Erie and Northern Ry., Galt, Ont., recently, was born at Cambuslang, near Glasgow, Scotland, May 26, 1884, was educated at the Glasgow and West of Scotland Technical College, and served an apprenticeship, from 1901, to 1906, with Niven and Haddis, Civil Engineers, Glasgow. He came to Canada in 1906, and was, to 1907, draughtsman, Dominion Bridge Co., Lachine, Que.; March to May 1907, topographer with survey party, C.P.R., Woodstock, N.B.; May 1907, to Oct. 1908, topographer and draughtsman, C.P.R., Nominig, Que.; Oct. 1908, to Sept. 1910, draughtsman and instrument man, Campbellford, Lake Ontario and Western Ry.; Sept. 1910, to July 1912, instrument man and transit man, same road; July 1912, to Dec. 1914, Resident Engineer, C.P.R. double track, White River, Ont.; March to Nov. 1915, draughtsman, Lake Erie and Northern Ry., Brantford Ont.

J. Mitchell Silliman, who has been appointed Resident Engineer, District 3, Eastern Division, C.P.R., Montreal, was born at Easton, Pa., Sept. 8, 1885, and graduated from Lafayette College, Easton, Pa., with the degree of C.E., in June, 1907, since when he has been, to Aug. 1907, leveller, right of way survey, Atlantic Division, C.P.R.; Aug. to Dec. 1907, transit man, District 2, Atlantic Division, C.P.R.; Jan. to Apr. 1908, rodman, reconnaissance surveys, Lake Superior Division, C.P.R.; May 1908 to Oct. 1909, transit man, District 1, Atlantic Division, C.P.R.; Nov. 1909 to Mar. 1910, transit man, District 1, Lake Superior Division, C.P.R.; Mar. 1910 to Mar. 1911, transit man, District 3, Lake Superior Division, C.P.R.;

Mar. 1911 to Sept. 1912, Resident Engineer, Construction Department, Guelph Jct.-Hamilton Line, C.P.R.; Sept. 1912 to Mar. 1915, Resident Engineer in charge of construction, Forsyth St. Branch, C.P.R., Montreal; Mar. to Dec. 1915, District Engineer of Construction in charge of Lake Erie & Northern Ry., Brantford, Ont.

Grain Inspection at Western Points.

The following figures issued by the Department of Trade and Commerce, show the number of cars of grain inspected at Winnipeg and other points on the Western Division for railways, for February, and for six months ended Feb. 29, with a comparison of the number of cars inspected for six months ended Feb. 28, 1915.

	Feb.	Six months to Feb. 29, 1916	Six months to Feb. 28, 1915
C.P.R.	6,230	114,070	44,425
C.P.R. Calgary	448	3,285	3,682
C.N.R.	4,063	59,695	28,652
G.N.R. Duluth	439	3,116	1,212
G.T.P.R.	2,059	29,471	11,509
Totals	13,239	209,637	89,480

Consolidation of Railway Act.—Replying to a question in the House of Commons, Mar. 1, the acting Minister of Railways said the work of consolidating the Railway Act was in progress. Besides the work usually incidental to consolidation, thorough enquiries and investigations have been made, involving conferences with the Board of Railway Commissioners and other bodies, into the working out of different sections of the act, with particular regard to those in respect of which amendments have been offered in recent years. Seven thousand dollars has been paid in respect of this work to S. Price, K.C.

Timiskaming and Northern Ontario Ry. and Grand Trunk Pacific Ry. Running Rights.—Questions were asked in the Ontario Legislature, Mar. 15, as to the refusal of the Grand Trunk Pacific Ry. to live up to its agreement regarding running rights over the Timiskaming and Northern Ontario Ry., and as to the failure of the Ontario Government to take legal action in the matter. The Provincial Treasurer said that the agreement did not give the Government power to bring action until the construction of the G.T.P.R. was completed and trains running over the system.

G.T.R. Conductor Convicted.—E. E. Sinclair, who is said to have been a G.T.R. conductor for about 30 years, was fined \$100 and costs, or 30 days imprisonment, in Toronto police court Mar. 17, for stealing \$5 from the company. A detective who boarded a train at Stratford for Toronto, with two of the company's office men, swore that he gave the conductor \$5 and that he and his two companions were given hat checks and permitted to travel to Toronto.

Lumber Freight Rates Advanced.—Washington, D.C., press dispatch, Mar. 26:—"Increase to 12c per 100 lbs., making net increases of from 1 to 2c on lumber and lumber products from St. Paul, Minneapolis, Duluth, Minnesota Transfer, Stillwater, Minn., Ashland, Wis., and points taking the same rates to Chicago, and Chicago rate points has been approved by the Interstate Commerce Commission."

The Algoma Steel Corporation has, it is said, arranged to make shells and other munitions at Sault Ste. Marie, Ont., and will erect a building 350 x 120 ft. for the purpose.

Transportation Appointments Throughout Canada.

Information under this head, which is gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canada Steamship Lines, Ltd.—C. E. CROFT, heretofore General Agent, Toronto, has been appointed Chief of Commissary Department. Office Toronto.

Canadian Government Rys.—C. K. HOWARD, heretofore Right of Way Agent, St. John and Quebec Ry., Fredericton, N.B., has been appointed Commercial Agent, Boston, Mass. Office, 294 Washington St. (See also National Transcontinental Ry.)

Canadian Northern Ry.—W. H. GRANT, Tie and Timber Agent, has also been appointed acting General Storekeeper, Lines east of Port Arthur, Ont., during the absence of L. C. Thomson, who has been loaned to the Imperial Munitions Board. Office, Toronto.

R. S. GUSCOTT, heretofore rate clerk, Division Freight Agent's office, Toronto, has been appointed Contracting Freight Agent, Toronto, vice C. E. Hudson transferred to the Tariff Department.

W. R. KELLY, Superintendent, Lake Superior District, has had his jurisdiction extended over the Pembroke Subdivision, so far as transportation matters covering the handling and movement of trains are concerned. All other matters on the Pembroke Subdivision, the handling and movement of trains are under the jurisdiction of J. IRWIN, Superintendent, Toronto District, Toronto.

G. STEPHEN, heretofore General Freight Agent, Winnipeg, has been appointed Assistant Freight Traffic Manager, Lines west of and including Port Arthur, Ont., and Duluth, Minn. Office Winnipeg.

W. G. MANDERS, heretofore Assistant General Freight Agent, has been appointed General Freight Agent, Western Lines, vice G. Stephen, promoted. Office, Winnipeg.

J. M. HORN, heretofore District Freight Agent, Edmonton, Alta., has been appointed Assistant General Freight Agent, Western Lines, vice W. G. Manders, promoted. Office, Winnipeg.

J. R. SCOTT, heretofore chief clerk, General Freight Department, Winnipeg, has been appointed District Freight Agent in charge of Fort William and Port Arthur, Ont. Office, Port Arthur.

L. A. FONGER has been appointed chief clerk, General Freight Department, Winnipeg, vice J. R. Scott, promoted.

T. E. COYLE, formerly in Northern Pacific Ry. service, has been appointed Trainmaster at Saskatoon, Sash., vice P. K. Manahan, whose transfer to Kamloops Jct., B.C., was announced in our last issue.

R. H. BELL, heretofore General Agent, Chicago, Ill., has been appointed District Freight Agent, Edmonton, Alta., vice J. M. Horn, promoted.

J. H. MCKINNON, heretofore General Agent, has been appointed District Freight and Passenger Agent, Duluth, Minn.

F. G. WOOD, heretofore Commercial Agent, St. Louis, Mo., has been appointed General Agent, Pittsburg, Pa., vice R. F. Clark, transferred.

R. F. CLARK, heretofore General Agent, Pittsburg, Pa., has been appointed General Agent, Chicago, Ill., vice R. H. Bell, promoted.

L. E. AYRE, heretofore in General Traffic Manager's office, Toronto, has been appointed Commercial Agent, St. Louis, Mo., vice F. G. Wood, promoted.

Canadian Pacific Ry.—G. B. BURPEE, has been appointed General Travelling Passenger Agent, vice N. R. Des Brisay. Office, Montreal.

J. M. SILLIMAN, heretofore Resident Engineer on construction, Lake Erie and Northern Ry., Brantford, Ont., has been appointed Resident Engineer, District 3, Eastern Division, C.P.R., vice J. H. Forbes, who has enlisted for active service overseas. Office, Montreal.

H. WALKER, heretofore Night Locomotive Foreman, Schreiber, Ont., has been appointed Locomotive Foreman, White River, Ont., vice F. H. Hetherington, who has enlisted for active service.

W. ASHMAN, heretofore Inspector of Investigation, Saskatchewan Division, Moose Jaw, has been appointed Inspector of Investigation, Manitoba Division, Winnipeg.

JAMES WEBBER has been appointed acting Inspector of Investigation, Saskatchewan Division, Moose Jaw, vice W. Ashman, transferred.

J. M. CHESSER has been appointed acting Inspector of Investigation, Alberta Division, Calgary, vice R. G. Carpenter, transferred.

W. J. BARBER, heretofore fitter, has been appointed acting Locomotive Foreman, North Bend, B.C., vice John Macrae, temporarily transferred.

JOHN MACRAE, heretofore Locomotive Foreman, North Bend, B.C., has been appointed acting Locomotive Foreman, Kamloops Jct., B.C.

S. G. DENMAN is acting Assistant Purchasing Agent at Vancouver, in place of A. C. Douglas, who is acting Assistant General Purchasing Agent at Montreal, while E. Fitzgerald, Assistant General Purchasing Agent, is Purchasing Agent for the British War Office and the Imperial Munitions Board.

R. G. CARPENTER, heretofore Inspector of Investigation, Alberta Division, Calgary, has been appointed Inspector of Investigation, British Columbia Division, Vancouver, vice H. P. Winderling.

G. H. GRIFFIN, heretofore City Passenger Agent, Buffalo, N.Y., has been appointed City Ticket Agent, Chicago, Ill., vice E. L. Sheehan, whose appointment as General Agent, Passenger Department, St. Louis, Mo., was announced in our last issue.

Canadian Pacific Ocean Services, Ltd.—A. S. MAYNARD, heretofore Chief Commissary Agent, C.P.R., Montreal, has been appointed Purchasing Agent, C.P.O. S. Ltd. Office, Montreal.

G. S. REID, heretofore Accounting Agent, C.P.R., Toronto, has been appointed Travelling Passenger Agent, C.P.O.S.Ltd., Montreal.

Chatham, Wallaceburg and Lake Erie Ry.—W. J. CURLE, heretofore Assistant Superintendent, Toronto, District, Ontario Division, Canadian Northern Ry., Toronto, has been appointed General Superintendent, C.W.&L.E.R., with jurisdiction over all departments, vice W. Norris, deceased. Office, Chatham, Ont.

D. L. WELCH, has been appointed General Freight Agent. Office, Chatham.

E. C. DAVIES has been appointed Freight Claim Agent. Office, Chatham.

Duluth, South Shore and Atlantic Ry. Mineral Range Rd.—I. H. HARSH has been appointed Purchasing Agent, vice P. W. Brown, who after many years of faithful service has retired from active work. Office, 1101 Fidelity Building, Duluth, Minn.

Duluth Winnipeg and Pacific Ry.—E. W. MYERS, heretofore chief clerk, Stores Department, Duluth, Minn., has been appointed storekeeper, Virginia, Minn., vice F. S. Matthey resigned, as announced in our last issue. (See also Canadian Northern Ry.)

Grand Trunk Ry.—P. M. BUTTLER, heretofore City Passenger and Ticket Agent, Ottawa, Ont., has been appointed General Agent, Passenger Department, in charge of passenger traffic in Ottawa, and will also perform such other special work as may be assigned to him from time to time. Office, Russel House Block.

JOHN CAMPBELL, heretofore Supervisor of Track, District 17, Hamilton, Ont., has been appointed Yardmaster, York yard, Toronto.

H. MCPHAIL, heretofore switch gang foreman, has been appointed Supervisor of Track, District 12, Gravenhurst, Ont., vice P. C. Heels, transferred.

P. C. HEELS, heretofore Supervisor of Track, Gravenhurst, Ont., has been appointed Supervisor of Track, with jurisdiction over track between Hamilton and Niagara Falls, and Port Colborne and Port Dalhousie, Ont., vice J. Campbell, assigned to other duties. Office, Hamilton, Ont.

L. H. CANT has been appointed City Ticket Agent, Galt, Ont., vice G. L. Misener, resigned.

G. A. BOND, heretofore agent, Sarnia, Ont., has been appointed agent, Brantford, Ont., vice R. Wright, appointed General Agent, Ontario Lines, Toronto, recently.

R. E. NEWCOMER is reported to have been appointed Trainmaster, London, Ont.

W. E. GERMAIN, heretofore agent, Alvinston, Ont., has been appointed agent, Sarnia, Ont., vice G. A. Bond, transferred.

Grand Trunk Ry.—Wabash Ry.—T. J. CASSIDY, heretofore Chief Dispatcher, has been appointed Trainmaster, St. Thomas Division, vice J. A. McLardy, transferred. Office, St. Thomas, Ont.

J. A. MCLARDY, heretofore Trainmaster, has been appointed Chief Dispatcher, St. Thomas Division, vice T. J. Cassidy, transferred. Office, St. Thomas, Ont.

Grand Trunk Pacific Ry.—H. DARBY, heretofore Locomotive Foreman, Biggar, Sask., has been appointed Locomotive Foreman, Regina, Sask.

W. W. YEAGER, heretofore Locomotive Foreman, Wainwright, Alta., has been appointed Locomotive Foreman, Biggar, Sask., vice H. Darby, transferred.

H. SAUNDERS, heretofore Car Foreman, Endako, B.C., has been appointed Car Foreman, Biggar, Sask., vice H. E. Jell, who has left the company's service.

F. J. LOZO, heretofore Locomotive Foreman, Calgary, Alta., has been appointed Locomotive Foreman, Wainwright, Alta., vice W. W. Yeager, transferred.

J. F. MOFFATT, heretofore Road Foreman of Locomotives, Wainwright, Alta., has resumed his former position as

locomotive driver, and no successor has been appointed.

J. HONAN, heretofore machinist, Midland Ry. of Manitoba, Winnipeg, has been appointed Locomotive Foreman, G.T.P.R., Calgary, Alta., vice F. Lozo.

E. OPIE has been appointed Car Foreman, Endako, B.C., vice H. Saunders, transferred.

National Transcontinental Ry.—O. LEMAY has been appointed acting Roadmaster, Quebec Subdivision, vice J. E. Simpson, assigned to other duties. Headquarters, Fitzpatrick, Que.

H. J. WHITE, heretofore Supervisor of Car Work, Canadian Northern Ry., Toronto, has been appointed General Car Foreman, N.T.R., with territory from Quebec, Que., to Graham, Ont. Office, Cochrane, Ont.

The territory of the respective Roadmasters of District 2, has been rearranged as follows: O'Brien Subdivision, from O'Brien to Cochrane, not including Cochrane yard; Roadmaster, W. R. MURRAY, Cochrane, Ont.; Cochrane Subdivision, from Cochrane to Hearst, not including Hearst yard; Roadmaster, P. HOUSTON, Cochrane, Ont.; Hearst Subdivision, from Hearst to Grant, not including Grant yard; Roadmaster, M. J. SHERIDAN, Grant, Ont.; Armstrong Subdivision, from Armstrong to Superior Jct., not including Superior Jct. yard; Roadmaster, J. F. FLYNN, Armstrong, Ont. (See also Canadian Government Railways.)

Quebec Central Ry.—G. D. WADSWORTH, heretofore chief clerk, Traffic Department, has been appointed Assistant General Freight and Passenger Agent. Office, Sherbrooke, Que.

J. T. HAWKINS, heretofore chief claims clerk, has been appointed Freight Claim Agent, in charge of all claims for overcharges and loss and damage to freight, also all correspondence concerning over, short, damaged, refused and unclaimed shipments. Office, Sherbrooke, Que.

Wabash Ry.—J. E. TAUSSIG, heretofore Assistant to President, has been appointed Vice President in charge of operation. Office, St. Louis, Mo.

L. G. SCOTT, heretofore Auditor, Texas and Pacific Ry., Dallas, Tex., has been appointed Comptroller in charge of the Accounting and Treasury Departments. W.R. Office, St. Louis, Mo.

Government Employees and the War.—The acting Minister of Railways and Canals, stated in the House of Commons, Mar. 9, that 573 employees of the Department and Canadian Government Railways, had been granted leave of absence to enlist for overseas service under the various orders in council dealing with the enlisting of Government employees. The Intercolonial Ry. heads the list with 455 enlisted employees. Of the total number, 8 have been killed in action, 2 have died since enlisting and a number are included in the list of wounded and missing. Officials and employees of the Government railways had made two contributions of one day's pay to the Canadian Patriotic Fund, totalling \$37,973.64.

Scrap Material sold by the Pennsylvania Rd. during 1914 brought \$2,157,241.24, which is \$1,000,000 less than was obtained by the same means in 1913. Some of the items and amounts were as follows: Old wheels, metals and wrought iron, \$780,000; locomotives and wooden passenger cars, \$114,326; waste paper, \$19,211; oil barrels, \$22,439; old rubber, \$15,222.

Canadian Northern Railway Construction, Betterments, Etc.

James Bay & Eastern Ry.—A trust deed dated Sept. 1, 1915, made between the company and the Guardian Trust Co., securing an issue of 30 year 5% debenture stock or bonds has been filed with the Secretary of State at Ottawa. It is reported that some further construction is likely to be gone on with at an early date. J. P. Mullarkey has a contract for grading westerly from Roberval towards James Bay, and some part of the work has been done.

Canadian Northern Ontario Ry.—The Minister of Lands informed the Ontario Legislature, Mar. 7, that the company had made application to designate the lands to be granted it under the statute, but that no lands had as yet been assigned by the Minister as subsidy lands.

Canadian Northern Ry.—M. H. MacLeod, General Manager and Chief Engineer, is reported to have said in an interview at Saskatoon, Mar. 4, that a considerable mileage of steel will be laid on already completed grading in Saskatchewan and Alberta during this year, at the points most urgently required; the mileage will depend upon the quantity of steel that can be obtained.

The Dominion Parliament has extended the time for the building of a line from near Grosse Isle, on the Oak Point Branch, northerly and westerly to Grand Rapids, near the head of Lake Winnipeg, with a branch to Sturgeon Bay, on the same lake.

The Regina Board of Trade passed a resolution, Mar. 3, asking the company to undertake as early as possible this year the completion of the Regina-Avonlea line, for the construction of which the company's bonds have been guaranteed by the Saskatchewan Legislature.

The Premier of Alberta in a statement regarding railway construction in the province, is reported to have said, on Mar. 4, that the rails for the St. Paul de Metis line had been shipped from eastern points, that track laying will be started as soon as the rails arrive, and that it is expected to have track laid on the 85 miles of completed grading by the end of June. The line is being built under the C. N. Western Ry.'s Alberta charter and leaves the C.N.R. main line at Oliver, and its construction for 100 miles is provided for by a provincially guaranteed bond issue. The report of the Minister of Railways for the year ended Dec. 31, 1915, states that 86.2 miles of grading have been completed.

Grading was completed on the company's line south of Calgary to Lethbridge, up to the end of 1915, for 56.49 miles. The distance between these two points is 105 miles, and the provincial guarantees also cover the building of a line from where the Calgary-Lethbridge line crosses the Little Bow River, via Macleod to the International Boundary, 110 miles.

Canadian Northern Pacific Ry.—We are officially advised that the building of the line into New Westminster, B.C., is under discussion, but the details will not be settled for some time.

Vancouver Terminals.—Sir W. MacKenzie, President, C.N.R., was in Vancouver Feb. 26, and met a number of members of the city council and talked over matters connected with the development of the False Creek flats and the proposal to build a union station with the Great Northern Ry. This latter is a definite

C.N.R. proposal, and plans for such a station were sent to the G.N.R. offices in St. Paul, Minn., after having been laid before the city council by M. H. MacLeod, Feb. 15. Mr. MacLeod subsequently went to St. Paul, and on Mar. 9 informed the Mayor of Vancouver by telegram that he had been unable to come to terms with the G.N.R. respecting the building of a union station. The C.N.R. will therefore proceed with the erection of its own station at an estimated cost of \$1,000,000, the plans for which will be submitted for approval on an early date. The city council passed a resolution, Mar. 15, calling on the company to proceed with the laying out of the terminals and building the station at False Creek in accordance with the terms of the agreement. The company agreed to do all the work within five years, two years of which are unexpired.

The specifications for the temporary car ferry slip at Port Mann, call for a structure capable of accommodating a ferry 335 ft. long. Tenders for this work are being invited.

Lines on Vancouver Island.—A press report dated Mar. 18 states that track laying has been started on the Victoria-Patricia Bay line. (Mar., pg. 94.)

It was reported Feb. 15 that a contract had been let to W. S. Doe, Victoria, for the building of a bridge across Selkirk water, as the approach to the company's proposed terminals on the Songhees reserve property.

Grand Trunk Ry. Statement for 1915.

Subject to audit, the accounts for the year to Dec. 31, 1915, show the following results:—

Gross revenue	\$1,154,650
Working expenses	1,000,000
Net revenue	154,650
Income tax, interest, and car mileage balances	1,000,000
Total net revenue	\$2,154,650
Net revenue charges for the year, less	
Deduct Grand Trunk Western deficiency for year ended June 30, 1915	\$122,200
Detroit, Grand Haven & Milwaukee deficiency for year ended Dec. 31, 1915	1,850
Surplus	\$210,700
Less interim dividend paid on 4 per cent. guaranteed stock	

This balance of \$210,700 added to the amount of \$4,300 from Dec. 1914, makes a total amount of \$215,000, which will admit of a further payment for the year of 2½% on the 4% guaranteed stock, making the full dividend for the year, and leaves a balance of about \$15,000 to be carried forward.

The accounts of the Grand Trunk Western Ry. for the half year ended Dec. 31, 1915, after providing for net revenue charges, show a surplus of \$108,500, which amount is carried forward to the current half year.

Freight on Hides to Boston.—In the case of Swift & Co. vs. Minneapolis, St. Paul & Sault Ste. Marie Ry., the Interstate Commerce Commission decided at Washington, D.C., Feb. 29, that proposed increased carload rate for transportation of green salted hides from St. Paul, Minneapolis, and Minnesota Transfer, Minn., to Boston, Mass., and Boston rate points, via Sault Ste. Marie, Mich., was not justified, and required to be cancelled.

Traffic Orders by Board of Railway Commissioners.

Rates on Tank and Still Structural Material from Sarnia to Regina.

24727. Feb. 16. Re Canadian Northern Ry.'s Special Proportionate Freight Tariff, C.R.C. E732, applicable on tank and still structural material in carloads, ex Sarnia, Ont., from Toronto to Regina, Sask.: Upon hearing the matter at Ottawa Feb. 9, in the presence of counsel for Canadian Northern, Canadian Pacific and Grand Trunk Railways, the Pere Marquette Rd. being also represented, it is ordered that the said tariff be disallowed.

24750. Feb. 19. Re application of Imperial Oil Company, Ltd., under sec. 334 of the Railway Act, for an order requiring the Pere Marquette Rd. Company, the Canadian Pacific, Canadian Northern and Grand Trunk Railway companies, to agree upon and file a joint tariff on tank and still structural material, in carloads at 75c per 100 pounds from Sarnia, Ont., to Regina, Sask. Upon hearing the matter at Ottawa, Feb. 9, in the presence of counsel for the applicant company, the Canadian Northern, Canadian Pacific and Grand Trunk Railways, and Pere Marquette Rd. being also represented at the hearing, it is ordered that the application be dismissed.

Freight Rates on Whole Peas.

24788. Mar. 9. Re applications of Boards of Trade of Montreal and Toronto for an order disallowing the proposed increase in rates on peas (whole) from stations in Canada to eastern United States points, as published by Canadian Pacific and Grand Trunk Railways: Upon hearing the application at Ottawa, March 7, the Montreal and Toronto Boards of Trade and the Grand Trunk and Canadian Pacific Railways being represented, it is ordered that the elimination of peas (whole) from the list of articles taking grain rates from stations in Canada to points in the eastern United States, as provided in following schedules, issued to become effective March 20 and 21, be suspended until further order, viz., Canadian Pacific, Supplement 1 to Tariff C.R.C. no. E-2935; Grand Trunk, Supplement 20 to Tariff C.R.C. no. E-1860, Supplement 21 to Tariff C.R.C. no. E-1861, Supplement 13 to Tariff C.R.C. no. E-1872; Windsor, Essex & Lake Shore Rapid Ry., Supplement 1 to Tariff C.R.C. no. 158; Chatham, Wallaceburg & Lake Erie, Supplement 1 to Tariff C.R.C. no. 357; Essex Terminal, Supplement 1 to Tariff C.R.C. no. 256. And it is further ordered that provision be forthwith made for continuing until further order the rates on peas (whole) in the following schedules, issued to become effective April 1, viz., Michigan Central, Tariff C.R.C. no. 2507; Chatham, Wallaceburg & Lake Erie Ry. Tariff C.R.C. no. 394; Canadian Northern Ry., Tariff C.R.C. no. E-743; Essex Terminal, Tariff C.R.C. no. 300.

C.P.R. Release Form, Etc.

24789. Mar. 6. Re the application of C.P.R., under sec. 340 of the Railway Act, for approval of form 1735, being a release and power of attorney to be signed by persons who desire, for special reasons, to travel in cars which are not intended to carry passengers. Upon reading the report of the Chief Traffic Officer of the Board, and what is filed in support of the application, it is ordered that the form of 1735, on file with the Board, be approved.

Notices of Embargoes.

General order 160. Feb. 24. Re general order 95, Nov. 2, 1912, requiring rail-

way companies to file copies of any embargo issued against any traffic; and re the application of the Canadian Northern Ry. for a ruling as to whether embargo notices given to shippers on its lines as a result of an embargo placed on joint traffic by a connecting carrier should be reported to the Board: Upon reading what is filed, and the report of the Chief Operating Officer of the Board, it is ordered that railway companies be directed to report to the Board embargoes of any kind, within the time and as provided by general order 95, whether such embargoes are placed by companies subject to the Board's jurisdiction or by any carrier having connections with them. And it is further ordered that every such railway company report to the Board by telegram, with all possible dispatch, all accidents, failures, and obstructions on or to the railway, or to engines or rolling stock or other facilities, as a result of which the usual railway operations in any district or at any point will be delayed or impeded for a longer period than 24 hours; the nature of the occurrence creating such a situation; the steps taken to remedy it, and the time necessary to restore the railway sufficient for the requirements of ordinary and regular traffic.

C.P.R. Colonization Plans.

The C.P.R., according to a press interview with Baron Shaughnessy, has decided on a comprehensive plan of colonization. The details are being worked out and involve the preparation of about 1,000 farms for occupation in the spring. One of the most serious problems to be faced in Canada will be, said Baron Shaughnessy, the handling of the thousands of returned Canadian soldiers and the immigration of the returned soldiers from Great Britain. Provision must be made for them, as large numbers will be so unsettled as to be unfit to return to their former occupations. He also said: "Realizing that the situation must be met, and willing to take its share of the burden, of trying to solve this problem and assist the men who have fought the battles of the empire, the C.P.R. has decided to establish in Western Canada, colonies, which for the moment we are calling returned veterans' colonies, where men who wish to go in for farming can obtain improved farms, on terms which will, in time, enable them to become land owners and to create homes for themselves and their families. These colonies will be given distinctive names, probably with military associations, and will contain a sufficient number of families in each to ensure social, school and church facilities and in each case, will include a central instructive farm under a competent agriculturist so that advice and instruction may be available for the colonist."

The Delaware, Lackawanna & Western Rd. Co. has been licensed by the Ontario Government to maintain passenger and freight offices and to maintain a bank account, and do ordinary matters pertaining to railway business other than actual construction or operation of a railway within the province, but not to use any larger amount of capital than \$40,000. Allen Leadlay, Freight and Passenger Agent, Toronto, has been appointed attorney.

Weighing and Reweighing Car Load Freight at Detroit.

In the case of the Detroit Coal Exchange and Builders and Traders Exchange of Detroit, vs Michigan Central Rd., Detroit and Charlevoix Rd., Grand Trunk Western Ry. and Grand Trunk Ry., the complaint being that the rules and charges governing the weighing and reweighing of car load freight in Detroit, Mich., were unreasonable and unduly preferential, the Interstate Commerce Commission has decided: That the Commission has jurisdiction of the weighing service, when the freight is moved in interstate commerce. That it is the duty of the delivering carrier, upon reasonable request, to reweigh carload freight which has been transported in interstate commerce. That the present charges for this service in Detroit, Mich., are unjust and unreasonable. Just and reasonable charges prescribed for the future. That the inability of carriers participating in the interstate transportation of a car to agree upon their respective assumptions of costs for reweighing when such reweighing develops a shortage in excess of the limit of tolerance, cannot be used to increase charges against the shipper.

Alberta Government Aided Railway Construction.—The Alberta Railways Department annual report for the year ended Dec. 31, 1915, shows that 326 miles of new railways were completed, though not all placed in operation during the year, of which 304 miles were built of the railways, the bonds of which are guaranteed by the province. Altogether the province has authorized the guarantee of bonds for 3,471.87 miles of railways, and the guarantee has been executed for 2,535.97 miles. Of this mileage there has been completed 1,595 miles, upon the following companies' lines:—Canadian Northern Ry., 776 miles; Grand Trunk Pacific Ry., 259 miles; Edmonton, Dunvegan & British Columbia, 337 miles; Alberta & Great Waterways, 175 miles; Central Canada, 48 miles. In addition to the completed mileage, 400.59 miles of grading was done on the following lines: Canadian Northern, 233.57 miles; Edmonton, Dunvegan & British Columbia, 13 miles; Alberta & Great Waterways, 116 miles; Central Canada, one mile; Lacombe & Blindman Valley, 37 miles. The mileage completed and graded represents 70% of the lines for which the provincial guarantees have been executed.

Shipments of Explosives on Canadian Northern Ry.—In reference to the Board of Railway Commissioners' decision refusing to make an order directing the C.P.R. and G.T.R. to receive shipments of explosives from the Canadian Northern until that company satisfied the Board that it had appointed a competent inspector and made proper arrangements for the inspection of shipments of explosives originating on its line, and which is given in full on pg. 134, we are officially advised by the Canadian Northern operating management that it is observing all the rules and instructions in regard to handling explosives and other dangerous articles as issued by the Bureau of Explosives, that the inspection of shipments originating on its line is made by its agents' staff at the points where shipments are received, and that it is practically covering the matter as fully as though the Bureau's inspectors were doing the work. The Board, however, has not signed the order applied for and the matter is in statu quo.

Canadian Railway AND Marine World

ESTABLISHED 1898

Devoted to Steam and Electric Railway,
Marine, Express, Telegraph, and Railway and Canal
Contractors' Interests.
Official Organ of various Canadian Transportation
Associations.

Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C. E.
Managing Director and Editor-in Chief.

AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editors
JOHN KEIR AND DONALD F. KEIR

Canadian Business Representative,
W. H. HEWITT, 70 Bond Street, Toronto

United States, Business Representative,
A. FENTON WALKER, 143 Liberty St., New York

European Business Representative,
J. MEREDITH MCKIM, 16 Regent St., London, Eng.

Authorized by the Postmaster General for Canada,
for transmission as second class matter.

Entered as second class matter, July 25, 1913, at the
Postoffice at Buffalo, N.Y., under the Act of Congress
of March 3, 1879.

SUBSCRIPTION PRICE, including postage any-
where, \$2 a year.

SINGLE COPIES, 20 cents each, including postage.

The best and safest way to remit is by express money
order. Where one cannot be obtained, a post office
money order, or bank draft, payable at par in Toronto,
may be sent. Cheques or drafts not payable at par in
Toronto cannot be accepted. Remittances should be
made payable to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by
the 10th of the month preceding the date of publication.

TORONTO, CANADA, APRIL, 1916.

PRINCIPAL CONTENTS.

Appointments, Transportation	144
Birthdays of Transportation Men	133
Board of Railway Commissioners,—	
Orders by, Summaries of	149
Traffic Orders	146
Canadian Northern Ry. Construction	145
Interchange of Traffic at North Bay	136
Tank Cars	131
Electric Railway Department	150 to 157
Brantford Municipal Ry. and Grand Valley Ry.	154
Car Equipment, Recent Developments....	150
Construction, Betterments, etc.	156
Finance, Meetings, etc.	157
Hydro Electric Radial Railways in Ontario	151
Peterborough Radial Ry., Sale of	154
Port Arthur Civic Ry. Work Car	152
Railway Charters in Niagara Peninsula....	153
Express, Among the	168
Freight and Passenger Traffic Notes	148
Freight Rates on Steel, Sarnia to Regina...	129
Grain Congestion in Goose Lake District...	140
Grain in Store at Terminal Elevators	148
Grand Trunk Ry. Bonaventure Station, Mont- real	141
Financial Statement for 1915	145
Marine Department	158 to 168
Canada Steamship Lines' Report	160
Coast, Lake and River Steamship Officers for 1916	158
Shipping Companies and Longshoremen at St. John	159
Shipping Letters from Head of the Lakes Welland and Georgian Bay Canals, Econo- mic and Strategic Aspect	161
Mainly About Railway People	142
Nigerian Railway Freight Cars	133
Railway Development	138
Railway Earnings	141
Railway Finance, Meetings, etc.	137
Railway Mechanical Methods and Devices...	135
Railway Rolling Stock Notes	139
Tie Tests in England	134
Toronto, Hamilton & Buffalo Ry. Grade Sep- aration Plans	127
Track Work for Spring	132

The Winnipeg Traffic Club held its first
annual supper at the union station
restaurant, Mar. 17, A. Syme being in
the chair. The feature of the evening
was an address on the railway ticket
business by A. Calder, who was referred
to as Winnipeg's pioneer ticket agent.

Rate Increases in Western Classi- fication Territory.

The Interstate Commerce Commission
gave a decision at Washington, D.C., Feb.
8, which is summarized as follows: Pro-
posed increase from 30,000 to 40,000 lbs.
in the minimum carload weight on grain
products and from 40,000 to 50,000 lbs.
in the minimum carload weights on wheat
and rye found justified. Following 1915
Western Rate Advance Case, 35 I. C. C.,
497, 603-611, proposed increased rates on
bituminous coal from Illinois mines and
other points to points west of the Missis-
sippi River found justified. Cancellation
of present interstate commodity rate on
gas coke in carloads from St. Charles,
Mo., to St. Louis, Mo., found justified.
Proposed increased rates on broom corn
from points in Kansas and Oklahoma to
points in Colorado and New Mexico not
justified. Proposed increased rates on
wheat and corn between Arkansas sta-
tions on the St. Louis & San Francisco
Rd. and Memphis, Tenn., justified.

War Purchasing Staff.—In addition
to E. Fitzgerald, Assistant General Pur-
chasing Agent, C.P.R., who is Purchasing
Agent for the British War Office and the
Imperial Munitions Board, with office in
Union Bank Building, Ottawa, W. H.
Stewart, until recently Assistant Super-
intendent, C.P.R., Farnham, Que., has
been "loaned" to the Imperial Munitions
Board and is assisting Mr. Fitzgerald. L.
C. Thomson, General Storekeeper, Cana-
dian Northern Ry., Toronto, has also
been "loaned" to the board and has been
appointed its Superintendent of Trans-
portation, attending to all products
handled by it. The British War Office
Purchasing Department, known as the
War Office Service, which was established
at 114 Windsor St., Montreal, under Mr.
Fitzgerald, in May 1915, and moved to
Ottawa a few months ago, has been re-
moved back to its former location in
Montreal where it is in charge of K. K.
Donnelly, of the General Purchasing
Department, C.P.R., representing Mr.
Fitzgerald.

Special Rates for Farm Laborers.—A
press dispatch says that Canadian rail-
ways have granted the Dominion Govern-
ment's request for a passenger rate of 1c
a mile in Canada for United States farm
laborers, who are expected to come over
in considerable numbers as a result of the
Interior Department's campaign being
carried in the U.S. We are officially
advised that the Eastern Canadian Pas-
senger Association considered the condi-
tions so urgent that they acceded to the
Government's request and will issue tick-
ets practically on the basis of 1c a mile
to farm laborers. Tickets will be sold to
points in Ontario from Niagara Falls,
Bridgeburg, Windsor and Sarnia from
Mar. 21 to May 21 inclusive.

Cost of National Transcontinental Ry.
—The commissioners' 11th annual report,
just issued, covers the year ended Mar.
31, 1915, and is signed by Hon. F. Coch-
rane, Minister of Railways and Canals,
as commissioner. The total expenditure
during the fiscal year was \$9,834,746.75,
which brought up the total expenditure,
from the organization of the commission
in 1904 to Mar. 31, 1915, to \$152,802,745.
77. Up to that date there had been laid
2,352.58 miles of track, distributed as fol-
lows: Main line, 1,803.44 miles; double
track and line from bridge to Quebec,
19.61 miles; sidings, yards, pit spurs, etc.,
529.53 miles.

Telegraph Efficiency on the C.P.R.

George Bury, Vice President, C.P.R.,
has issued a circular to the company's
various telegraph offices, reading as fol-
lows: "The company having undertaken
the transmission of telegrams for the
public over its wires, it is of the highest
importance that this service be per-
formed in a thoroughly efficient manner,
and the most careful attention to this
business is enjoined upon every one con-
nected with the telegraph service.
Celerity in transmission and delivery,
accuracy and privacy, are of the first
importance and no shortcomings in these
particulars will be tolerated. It must be
remembered that no person, not except-
ing the highest officer of the company,
has the right to know the contents of any
private telegrams entrusted to the com-
pany for transmission, except that tel-
egraph superintendents, inspectors and
others designated by the proper author-
ity in the Telegraph Department have
the right to examine the telegraph bus-
iness to check up transmission and de-
livery, or other defects in service. The
greatest care must be taken to prevent
private telegrams from being seen by
persons for whom they are not intended
and any employee of the company divul-
ging the contents of such a telegram will
be punished by immediate dismissal. Gen-
eral superintendents are requested to co-
operate with the Manager of the Com-
pany's Telegraph every possible way to
secure the desired efficiency, and to see
that all persons connected with the
telegraph service on their respective div-
isions fully carry out his instructions
concerning commercial telegraph bus-
iness."

**National Transcontinental Ry. Grain
Shipments.**—Replying to questions in the
House of Commons Mar. 1, Hon. J. D.
Reid, acting Minister of Railways, said
20 cars of wheat had been shipped on the
6c per bushel rate on the N.T.R. from
Armstrong to Montreal, and 80 cars had
been shipped at the same rate from Arm-
strong to Quebec. The rate for grain
from Armstrong to St. John, Halifax, and
Portland, Me., was 14.22c a bushel, for
export. The rate from Armstrong to
Montreal for domestic consumption was
12c a bushel, and from Armstrong to Que-
bec, for domestic consumption, 15c a
bushel.

The Vancouver Transportation Club
was organized in Vancouver, B.C., Mar.
10, with an initial membership of over
100 and the following officers: President,
J. W. Faulds of D. E. Brown, Hope and
Macauley; First Vice President, E. J.
Burns, Great Northern Ry.; Second Vice
President, C. E. Laing, C.P.R.; Secretary-
Treasurer, H. W. Schofield, C.P.R.; other
directors: C. E. Jenney, G.T. Pacific Ry.;
A. A. Whitnall, Great Northern Ry.; J.
W. Nott, Allan Line Steamships; J. E.
Archer, Great Northern Express Co.; C.
A. Whitlock, Donaldson Steamship Line.
The club has been formed for local
purposes.

Railway Lands Patented. Letter pat-
ent were issued during February, cover-
ing Dominion railway lands in Manitoba,
Saskatchewan, Alberta and British Col-
umbia, as follows:

Alberta Central Ry.	95
Alberta & Great Waterways Ry.	68
Calgary & Edmonton Ry.	3,037.00
Canadian Northern Ry.	640.00
Grand Trunk Pacific Branch Lines Co.	14.43
Qu'Appelle, Long Lake & Saskatchewan Rd. & Steamboat Co.	6,566.43
Total	10,259.49

Freight and Passenger Traffic Notes.

The C.P.R. resumed service over the Outlook branch, Sask., Mar. 15.

The C.P.R. announced in Winnipeg, Mar. 15, that the entire system had been cleared from the effects of the Jan.-Feb. snowstorms.

The Canadian Northern Pacific Ry. was finally cleared for through traffic, Feb. 29, after the effects of the Jan.-Feb. snowstorms.

The Canadian Northern Ry. expect to inaugurate a daily train service between Toronto and Winnipeg, in connection with its transcontinental traffic, June 1.

The G.T.R. started, Mar. 15, running the 6.45 a.m. train from Rouse's Point, N.Y., to Montreal, and the 5.30 train from Montreal to Rouse's Point, via Ithaca, Que.

The C.P.R. resumed its steamship service on Okanagan Lake, Mar. 13, which had been stopped on account of the severe weather at the end of January and early in February.

The C.P.R. upper lake steamships will, it is said, arrive at Port Arthur, Ont., during the coming navigation season, at 8 a.m., except the s.s. Manitoba, which will arrive Fridays at 3 p.m.

The Edmonton, Dunvegan & British Columbia Ry. announced Mar. 16 that it would give the same freight rates as the other companies from its territory for the spring horse show, April 4 to 8.

The Grand Trunk Pacific Ry. announces that its steamship, Prince John, will leave Prince Rupert for Skagway every Thursday at noon, returning therefrom every Sunday at 1 p.m., from Mar. 30 to June 8.

The Intercolonial Ry. has discontinued temporarily, the Ocean Limited train between Halifax and Montreal. The last trip eastward from Montreal was on Mar. 7, and the last trip westward from Halifax was Mar. 8.

Petrograd, Russia, press dispatch, Mar. 10: "The Minister of Ways and Communications has announced plans for promoting direct freight trade facilities between Russia and Canada by way of Vladivostok, Siberia, and Victoria, B.C."

The Canadian Northern Ry., according to a Port Arthur press report, is arranging to open up the Lake Nipigon district for tourist purposes. It is proposed to erect a fishermen's lodge on the lake, to accommodate parties up to 20, for which camp equipment will be supplied from the Port Arthur Hotel.

In addition to the regular standard, tourist and observation car service, the C.P.R. inaugurated on Mar. 22 a new tourist car service between Winnipeg, Saskatoon and Edmonton, for the benefit of homeseekers leaving Winnipeg, Thursdays and returning Tuesdays. It will be continued until Oct. 31.

It was reported in Vancouver, Mar. 17, that the Pacific Great Eastern Ry. had been opened for traffic from Squamish to Cheakamus Canyon, B.C., 19 miles, and that the clearing of the track thence to Clinton, mileage 146 from Squamish, was being proceeded with. The railway became blocked in the first snowstorm at the end of January.

To make freight rates east of Levis, Que., uniform with those in effect west thereof and on the National Transcontinental Ry. west of Moncton, the mileage tariff rate on the Intercolonial east of Levis on certain forest products for local consumption, short haul has been raised,

as follows: Distance over 5 to 80 miles, $\frac{1}{2}$ cent per 100 lbs.; over 80 to 90 miles, $\frac{3}{4}$ cent per 100 lbs.; over 90 to 100 miles, $\frac{1}{2}$ cent per 100 lbs.

The Intercolonial Ry., the Prince Edward Island Ry., the New Brunswick & Prince Edward Island Ry., the International Ry. of New Brunswick, the St. John & Quebec Ry., and the National Transcontinental Ry. being Canadian Government railways, only one coupon is required in ticketing to any point thereon, except in the case of the P.E.I. Ry., where a separate coupon is required for the steamship

connection from Point du Chene to Summerside or from Pictou to Charlottetown.

An arrangement has been made by which farm laborers can travel on Canadian lines between Winnipeg and Kingsgate, B.C., at a 1c a mile rate. The special rate came into effect Mar. 20 and will be continued to May 15. No tickets will be sold for less than \$2. This arrangement was made, it was stated in the House of Commons, Mar. 20, in connection with a campaign inaugurated by the Interior Department to secure farm laborers from the United States.

Grain in Store at Terminal Elevators, Interior Terminal Elevators and at Public Elevators in the East.

Week ending Mar. 10, 1916.	Wheat. bushels.	Oats. bushels.	Barley. bushels.	Flax bushels.	Totals. bushels.
Port William—					
C.P.R.	4,356,478	892,828	386,770		5,636,076
Consolidated Elevator Co.	1,262,508	293,227	45,963	96,463	1,698,161
Empire Elevator Co.	1,691,212	493,195	128,285	188,620	2,501,312
Ogilvie Flour Mills Co.	1,294,009	139,469	77,589		1,511,067
Western Terminal Elevator Co.	1,444,483	292,234	42,151	137,728	1,916,596
G. T. Pacific	3,519,043	2,198,963	143,920	118,225	5,980,151
Grain Growers' Grain Co.	1,616,431	532,431	183,853		2,332,715
Port William Elevator Co.	1,036,502	340,708	46,945	25,998	1,450,153
Eastern Terminal Elevator Co.	947,841	225,411	56,785		1,230,037
Port Arthur—					
Port Arthur Elevator Co.	4,829,982	2,174,969	401,089	101,642	7,507,682
D. Horn & Co.	185,938	137,705	21,624	184,008	529,275
Dominion Government Elevator	1,840,675	971,552	122,384	85,112	3,019,723
Grain afloat	2,425,386	974,311			3,399,697
Total Terminal Elevators	26,450,488	9,667,008	1,657,358	937,796	38,712,645
Calgary Dom. Govt. Elev.	71,646	157,341	7,057	x 1,174	237,218
Saskatoon Dom. Govt. Elev.	1,923,635	457,846	30,977	40,577	2,453,035
Moose Jaw Dom. Govt. Elev.	1,900,000	318,000	16,000	39,000	2,293,000
Total Interior Terminal Elevators	3,895,281	933,187	54,034	x 1,174	4,963,253
Depot Harbor	26,309			79,577	26,309
Midland—					
Aberdeen Elevator Co.	251,084	134,702			385,786
Midland Elevator Co.	63,804	145,670			209,474
Tiffin, G.T.P.	600,239	572,385	189		1,172,813
Port McNicoll	1,685,527	106,288			1,791,815
Collingwood					
Goderich Elevator & Transit Co.	376,803	58,310			435,113
Kingston—					
Montreal Transportation Co.					
Commercial Elevator Co.				8,920	901,311
Port Colborne	305,290	587,101			
Prescott					
Montreal—					
Harbor Commissioners No. 1	221,410				221,410
Harbor Commissioners No. 2	316,628	368,654	128,560		813,842
Montreal Warehousing Co.	321,722	972,802	1,391		1,295,915
Quebec Harbor Commissioners	91,947	45,899	5,720		143,566
West St. John, N.B.	393,765	205,554	60,058		659,377
Halifax, N.S.					
Total Public Elevators	4,654,528	3,197,365	195,918	8,920	8,056,731
Total Quantity in Store	35,000,297	13,797,555	1,907,310	x 1,174 1,026,293	51,732,629
	x Corn				

Military Railway Construction.—London, Eng., cablegram, Mar. 1: "A letter signed 'British Railwayman,' given prominence by the Times says that the lack of light railways at the front is hampering military operations. The writer thinks the the probable obstacle to the remedying of this condition is the shortage of rails and rolling stock, but suggests that the Canadians might help." His assertion that numerous plants for railway construction in Canada are lying idle is denied by Canadian railway officials. The latter also say that the British Government has constructed several lines in which the Canadian Overseas Railway Corps has helped.

G.T.R. employees in military service.—At the commencement of the war, the G.T.R. allowed six months full pay to its employees volunteering. To Dec. 31, 1915, the amount thus paid totalled, for the G.T.R. and G.T.P.R., \$680,000, and the present monthly payroll for the same purpose is \$62,500. It has since been decided to discontinue this method and to contribute \$10,000 monthly to the Canadian Patriotic Fund.

Charges Against C.P.R. Conductors.—Six conductors and three outside men were committed for trial at Ottawa, Ont., Mar. 12, on charges of theft and conspiracy to defraud the C.P.R. The men charged are S. Alexander, C. A. Merriam, M. Baker, R. T. Carter, H. Dunham, C. A. Dunham and F. Nelson, conductors, and C. Borts, H. Merson and A. Pinero. It is alleged that tickets collected from passengers were resold to other parties at reduced rates, the transactions taking place at Ottawa and on the run between Ottawa and Montreal. All the men charged have since been found not guilty and acquitted.

G.T.R. conductor committed.—Wm. Neil, Niagara Falls, Ont., a G.T.R. conductor, who was on the Niagara Falls-Sarnia run, was committed for trial at Hamilton, Ont., Mar. 20, on the charge of stealing \$9 from the company. A detective testified that he gave the conductor \$9 for fare for himself and two companions, and an official swore that the conductor had not made a return of the money on the day in question. Defence was reserved for the higher court.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed the paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates of orders, immediately following the numbers, are those on which they were drawn.

General order 159. Feb. 18.—Ordering that following be added to rule 93 of train rules designated the Uniform Code for Canadian Railways, approved by order 7563, July 12, 1919, namely:—"By night or in foggy or stormy weather, proper lights must be placed on cars or engines obstructing main tracks within yard limits."

General order 160. Feb. 24.—Ordering that railway companies report to board embargoes of any kind, within time and as provided by general order 95, whether such embargoes are placed by companies subject to Board's jurisdiction, or by any carrier having connections with them; every such railway to report to Board by telegram, with all possible dispatch, all accidents, etc., on or to railway or to locomotives or rolling stock or other facilities, as a result of which usual railway operations in any district or at any point will be delayed or impeded for longer than 24 hours; also the nature of occurrence creating such situations and steps taken to remedy it, etc.

General order 161. Feb. 23. Prescribing regulations for uniform maintenance of way flagging rules for impassable track, to become effective Mar. 1, for the observance of every railway company within the legislative authority of the Parliament of Canada.

24740. Feb. 15.—Ordering C.P.R. to remove track sufficient to provide required clearance between Canmore Coal & Navigation Co.'s spur at Canmore, Alta., and certain buildings; clearance at tipple 1 and boiler house 2 to be approved until any reconstruction work is done, provided employees are kept off sides and tops of cars where restricted clearance is known.

24741. Feb. 21.—Approving Vancouver, Victoria & Eastern Ry. & Navigation Co. (G.N.R.) detail plans of station to be built in Vancouver, B.C.

24742. Feb. 21.—Authorizing C.P.R. to build spur for G. McAllister, Guelph, Ont.

24743. Feb. 19.—Approving C.P.R. drawing 55, showing falseworks over tracks at Toronto, where Bloor St. viaduct crosses.

24744. Feb. 21.—Authorizing G.T.R. to rebuild bridge carrying public road over its tracks at milepost 39.99 near Rockwood, Ont.

24745. Feb. 18.—Authorizing Essex Terminal Ry. to build spur for Canadian Postum Cereal Co., Windsor, Ont., connecting with M.C.R.

24746. Feb. 21.—Approving agreement between Bell Telephone Co. and Beatrice Telephone Association, Feb. 10.

24747. Feb. 21.—Authorizing C.P.R. to rebuild pile trestle bridge at 9th Ave., Broadview, Sask.

24748. Feb. 21.—Relieving C.P.R. from providing further protection at highway 1,700 ft. east of milepost 32, Teeswater Subdivision, Ont.

24749. Feb. 21.—Authorizing City of Toronto to build bridge over G.T.R. (old Belt Line), on extension of Mount Pleasant Road, through Mount Pleasant Cemetery.

24750. Feb. 19.—Dismissing Imperial Oil Co.'s application for order requiring Pere Marquette Rd., C.P.R. and Canadian Northern Ry., also G.T.R. and Canadian Northern Ry., to agree upon and file joint tariff on tank and steel structural material, in car loads, at 75c per 100 lbs., from Sarnia, Ont., to Regina, Sask.

24751. Feb. 22.—Amending order 13970, June 19, 1911, re filing and issuing C.P.R. freight tariffs.

24752. Feb. 23.—Authorizing C.P.R. to divert portions of road allowance at mileage 52.20, Winnipeg Beach Subdivision, Man.

24753. Feb. 22.—Ordering C.P.R. to rearrange its time table to provide that train leaving Eastray Jct. for Windsor Mills at 4.45 p.m., shall make connection with train leaving Montreal at 4.10 p.m. and arriving at Eastray Jct. at 6.38 p.m.

24754. Feb. 23.—Ordering G.T.R. to install improved type of automatic bell at crossing of road in Lot 25, Con. 2, Etobicoke Tp., Ont., 20 per cent. of cost to be paid out of railway grade crossing fund; bell to be installed by June 1.

24755. Feb. 23.—Ordering G.T.R., by June 1, to install bell at Ontario St., Burlington, Ont., 20 per cent. of cost to be paid out of railway grade crossing fund.

24756. Feb. 23.—Approving agreement between Bell Telephone Co. and McNab Telephone Co. Feb. 16.

24757. Feb. 23.—Ordering Bell Telephone Co. to install telephone in Mrs. E. J. Wheeler's house, Toronto, and provide all proper facilities for its use.

24758. Feb. 24.—Authorizing McKim Tp., Ont., to build highway crossing over C.P.R. Stobie Branch to continue Wilma St., from Notre Dame St. easterly.

24759. Feb. 23.—Authorizing G.T.R. to build siding for William Kennedy & Sons in Nottawasaga Tp., Ont.

24760. Feb. 24.—Ordering G.T.R. to stop trains 41 and 44 on flag at Martin's siding; neighboring residents to provide necessary shelter or platform.

24761. Feb. 24.—Dismissing applications of City of Hamilton, Ont., and Toronto, Hamilton & Buffalo Ry., to have Hamilton St. Ry. pay portion of cost of building new bridge carrying King St. over T. H. & B. Ry., and ordering that detail plans of bridge to be built under order 24614 be filed by T. H. & B. Ry. within three weeks from date for approval of Board's engineer.

24762. Feb. 24.—Ordering Toronto, Hamilton & Buffalo Ry. to cut off hedge and slope back embankments at crossing of Ancaster Road, to provide view of 1,320 ft. from west; 20 per cent. of cost to be paid out of railway grade crossing fund; work to be completed by July 1; and relieving T. H. & B. Ry. from maintaining watchmen there on Sundays, provided train movements over crossing be flagged.

24763. Feb. 24.—Dismissing application of Ontario Public Works Department, Colonization Roads Branch, for order authorizing grade crossing over G.T.R. near Whitney station.

24764. Feb. 25.—Ordering City of Berlin, Ont., to trim and keep trimmed from time to time trees obstructing view at crossing of King St., by G.T.R., so there shall always be clear and unobstructed view of all approaching trains.

24765. Feb. 17.—Authorizing Lachine, Jacques Cartier & Maisonneuve Ry. (G.T.R.) to divert and cross certain streets and lanes between Park Ave. No. 2 and St. Lawrence Boulevard, Montreal, and to build subway at St. Famille St., between St. Urbain and St. George Sts., with 12 ft. headroom, work to be done by Dec. 31, 1917, or order becomes inoperative.

24766. Feb. 25.—Approving agreement between Bell Telephone Co. and Rockwood & Oustic Telephone Co., Feb. 16.

24767. Feb. 26. Authorizing Canadian Northern Ry. and Grand Trunk Pacific Ry. jointly to build spur to Dominion Government elevator at Saskatoon, Sask., with connection between their respective lines; to cross certain streets and road allowance and rescinding order 23283, Feb. 11.

24768. Feb. 28. Ordering Grand Trunk Pacific Ry. pending installation of bell at crossing of Ottawa Ave., Edmonton, Alta., to protect crossing by day and night watchmen.

24769. Feb. 18. Authorizing Canadian Northern Ry. to connect with C.P.R. at Arthur St., Port Arthur, and near Current River, and rescinding order 24438, Nov. 9, 1915.

24770. Feb. 18. Relieving C.P.R., Canadian Northern Ry. and Canadian Northern Ontario Ry. from complying with provisions of Railway Act requiring consent of shareholders; and recommending to Governor in Council for sanction agreement between these companies dated Oct. 1, 1915.

24771. Feb. 26. Authorizing C.P.R. to build siding for Canadian Consolidated Rubber Co., Montreal.

24772. Feb. 29. Authorizing Canadian Northern Saskatchewan Ry. and C.P.R. to operate over crossing in s.w. 1/4 Sec. 9-26-4, w. 2m. without stopping, and relieving them from maintaining night signalman to operate interlocking plant; home signals and derails to be set clear for C.P.R. and key of tower to be left with C.P.R.

24773. Feb. 28. Ordering G.T.R., when required by traffic conditions, to provide a grade of 10 per cent. on approach to Concession Road, Oro Tp., Ont., to widen Ridge Road to 50 ft., and remove trees obstructing view of track; 20 per cent. of cost, not exceeding \$200, to be paid by Oro Tp., and rescinding order 24217, Sept. 25, 1915.

24774. Feb. 24. Authorizing Canadian Northern Ontario Ry. to build spur across Fourth St., Deseronto.

24775. Feb. 29. Authorizing Canadian Northern Saskatchewan Ry. and Grand Trunk Pacific Ry. to operate over crossing at Yorkton, Sask., without first stopping trains, and relieving them from maintaining night signalman to operate interlocking plant; home signals and derails to be set clear for G.T.P.R. and key of tower left with G.T.P.R.

24776. Feb. 28. Ordering that Bell Telephone Co. poles on Main St., Chesley, Ont., be moved from west to east side of street by Hydro Electric Power Commission of Ontario, at cost of town, less salvage value of present plant and added value of reconstructed plant to B.T. Co.

24777. Feb. 29. Authorizing Essex Terminal Ry. to build siding across Shepard Ave., Windsor, Ont.

24778. Mar. 1. Authorizing G.T.R. to build siding for W. Ellis, St. Clair Ave., Toronto.

24779. Mar. 2. Authorizing C.P.R. to build spur for D. Ackland & Son, Ltd., Calgary, Alta.

24780. Mar. 1. Authorizing Quinlan & Robertson, Ltd., to erect structure for track protection over G.T.R. and Canadian Northern Ry. at site of Bloor St. viaduct, Toronto, to be used only for transporting material or equipment required in the viaduct construction.

24781. Mar. 3. Authorizing Grand Trunk Pacific Branch Lines Co. to build spurs for Im-

perial Oil Co. from its Melville-Regina Branch in w. 1/2 Sec. 32-17-19, w. 2.

24782. Mar. 6. Authorizing Canadian Northern Ontario Ry. and Timiskaming & Northern Ontario Ry. to operate over crossing at North Bay, Ont., without stopping trains.

24783. Mar. 6. Authorizing C.P.R. to build extension to Gold Medal Lumber Co.'s siding for Maples, Ltd., Toronto.

24784. Mar. 9. Re Canadian Northern Ry. service on its Goose Lake line, Saskatchewan. This order is given fully on another page.

24785. Mar. 7. Ordering Grand Trunk Pacific Ry. to build present level crossing, about 336 ft. west of station at Kitwanger, B.C., to be completed by April 1.

24786. Mar. 7. Approving agreement between Bell Telephone and Derby Telephone Association.

24787. Mar. 7. Amending order 24776, Feb. 28, re G.T.R. grade approach to Concession Road, Oro Tp., Ont.

24788. Mar. 9. Suspending certain schedules, effective March 20 and 21, and eliminating whole peas from articles taking grain rates from stations in Canada to points in eastern United States. This order is given in full on another page.

24789. Mar. 6. Approving C.P.R. Form of Release and Power of Attorney, 1735, to be signed by persons who desire, for special reasons, to travel in cars which are not intended to carry passengers.

24790. Mar. 9. Authorizing City of Winnipeg to connect its tramway line with C.P.R. at Lac du Bonnet, Man., provided rights of C.P.R. at any time to extend said branch at Lac du Bonnet be reserved.

24791. Mar. 9. Authorizing Toronto Suburban Ry. and C.P.R. to operate over crossing near Guelph, Ont., without first stopping.

24792. Mar. 9. Authorizing Canadian Northern Ry. to divert highway between Secs. 26 and 27-39-19, w. 4 m., Alta.

24793. Mar. 9. Authorizing City of Toronto to rebuild bridge over C.P.R. at York St., by reinforcing span 16.

24794. Mar. 13. Ordering Great North Western Telegraph Co. forthwith to install telegraph apparatus in Michigan Central Rd. station in Hagersville, Ont., and appoint necessary operator.

24795. Mar. 14. Authorizing Canadian Northern Quebec Ry. to build three spurs at mileage 169.71 and 169.83 from Quebec, in Pointe aux Trembles parish, and to cross Montreal Terminal Ry.

24796. Mar. 14. Authorizing C.P.R. to build road diversion at mileage 93.4, Portal Subdivision, Sask., in lieu of existing road allowance between n. e. 1/4, Sec. 21-7-13, and s. e. 1/4, Sec. 28-7-13, w. 2 m.

24797. Mar. 16. Ordering Grand Trunk Pacific Branch Lines Co. to build interchange between its Government elevator spur and C.P.R. Outlook Branch, at Moose Jaw, Sask.

24798. Mar. 16. Ordering that demurrage toll of \$7 collected by C.P.R. from G. Husband, Dec. 12, 1914, on oats from Glen Ewen to East End, Sask., was not properly chargeable and therefore wrongfully collected; and authorizing C.P.R. to refund the amount.

24799. Mar. 14. Authorizing C.P.R. to divert road allowances between Secs. 3 and 4 and Secs. 7 and 8-8-21, w. 2 m., through s.e. 1/4 Sec. 4, to common crossin gat mileage 45.54, Weyburn-Lethbridge Branch, Sask.

24800. Mar. 15. Rescinding order 24652, Jan. 11, re Canadian Northern Ry. crossing at Sec. 27-46-23, w. 2 m., Sask.

24801. Mar. 14. Authorizing G.T.R. to build siding for International Harvester Co. of Canada, Ltd., Hamilton, Ont.

24802. Mar. 16. Authorizing C.P.R. to build road diversion at Sutherland Branch across road allowance at mileage 79.94, road diversion as approved by order 19620, to be closed.

24803. Mar. 16. Extending for five years, instead of three, as required under order 14115, time within which flues of boilers in service on White Pass & Yukon Ry. shall be removed and a thorough investigation made of the entire interior of the boiler.

24804. Mar. 16. Authorizing C.P.R. to build spur for Rignaud Granite Co., Rignaud, Que.

24805, 24806. Mar. 16. Authorizing C.P.R. to build road diversion at mileage 29, from Golden, B.C.

24807. Mar. 16. Authorizing Bell Telephone Co. to erect its telephone lines on north side of St. George's Crescent, between Wellington and Bruce Sts., Goderich, Ont.

24808. Mar. 18. Dismissing complaint of Nanaimo, B.C., Board of Trade against C.P.R. proposed new tariff, eliminating Nanaimo as a terminal freight point.

24809 to 24812. Mar. 16. Authorizing C.P.R. to build road diversions at mileage 24.25, 15.61, 22.62, and 30, from Golden, B.C.

24813. Mar. 17. Authorizing C.P.R. to build Kootenay Central Ry. at grade across highway at mileage 76.9 from Colvalli, B.C.

Electric Railway Department

Recent Developments in Electric Railway Car Equipment.

By W. G. Gordon, Transportation Engineer, Canadian General Electric Co., Ltd.

The Railways and Canals Department's statistics show that the electric railway systems of Canada for the year ended June 30, 1914, totalled 98,917,808 car miles, with a total operating expenditure of \$19,107,807, of which \$513,016 was for the maintenance of the electric equipment of cars. Putting this on a car mile basis, we find a total operating cost of 19.3c. per car mile, of which amount 0.52c. represents the cost of maintenance of the electric equipment of cars, or 2.7% of the total operating cost. A comparison with the figures for the previous year, ended June 30, 1913, is of decided interest. In that year there were 89,005,216 car miles run, with a total operating cost of \$17,765,372, of which \$614,167 was for the maintenance of the electric equipment of cars. On a car mile basis we find a total operating cost of 20c. a car mile, of which amount 0.69c. represents the cost of maintenance of the electrical equipment of cars, or 3.45% of the total operating cost. For the year ended June 30, 1912, the cost of maintenance of the electric equipment of cars was 0.768c. a car mile, or 4.4% of the total operating cost. It will thus be seen that the cost of maintenance of the electrical equipment of cars has been steadily coming down and forming a smaller percentage of the total operating cost. It appears obvious that this reduction has been effected as a result of the greater consideration that the electric railway companies are giving this subject. It must also be borne in mind that in the effort to keep down maintenance costs the railway companies have the earnest co-operation of the electrical manufacturers, who are keeping this phase constantly in mind in the design of new equipment and in the re-design of existing equipment. In this connection we may consider recent advances made in the design of the various items of electric equipment for cars, operating under city, suburban and interurban conditions.

Motors.—The ventilation which the modern motor receives has enabled the designers to secure 15% to 25% higher current carrying capacity for the same total weight of motor, with the fully ventilated type, over that possessed, for the same heating values, by the non ventilated type of motor. The method of ventilation further insures all parts of the motor being equally cooled, and eliminates the "hot spots" which exist in the closed motor. Our method of ventilation is by means of a fan which is an integral part of the armature core head, in conjunction with longitudinal ducts through the interior of the commutator and armature. The pinion end frame head with this type of ventilation is provided with a ring which diverts the air from the fan through openings in the head, the incoming air being drawn through a screened intake at the pinion end. Another method is to draw in cool air at the commutator end. This air travels in parallel paths to the pinion end, one path being under the commutator and through ducts in the armature punchings, the other through spaces between the field coils and over the surface of the armature. A fan at the pinion end forces the air out of the frame. In the first case, the air drawn

in at the pinion end first travels over the armature and between the field coils, and then through the armature and out at the pinion end; whereas, in the second case, these two paths are in parallel. If special conditions require that the motor be operated entirely closed, the first method of ventilation is used, the ring being left out. This permits of the air being circulated internally; and, even under these conditions, the motors are capable of increased service capacity over the non ventilated type. The ability of the ventilated motor to dissipate heat depends in a great measure on the amount of cooling air drawn in by the fan as influenced by the armature speed. The advantages gained by ventilation depend, therefore, on the character of service. In city service, with frequent stops and a consequent low average ampere speed, the advantages of the ventilated motor are less than any used for interurban service, having infrequent stops and a high average armature speed. Generally speaking, in city service having frequent stops and schedule speeds of from 8 to 10 miles an hour, the ventilated motor can handle from 10 to 15% heavier loads than the closed motor of the same horse power rating. For interurban service having infrequent stops and schedule speeds of 18 miles an hour or more, the ventilated motor will handle from 25 to 30% heavier loads than the closed motor with the same horse power rating.

Any saving in weight effected in the motors for any given service means a saving in the weight of the total car equipment; and the reduced power consumption is in direct ratio to this saving; it also means a saving in maintenance costs on account of reduced wear on trucks and track. Five cents a pound is the figure generally used in estimating the yearly saving for weight reduction, the limits being from 3 to 8c.

The use of commutating poles, and cutting down the mica between commutator segments, has largely decreased the maintenance costs on commutators, brushes, and brush holders, through greatly reducing brush and commutator wear; and, through improved commutation, eliminating flash overs. With commutating poles there are lower magnetic densities, and commutator and core losses are reduced, resulting in an increase in capacity and efficiency. The use of commutating poles has also made field control practicable for special cases where conditions warrant its use. The use of the shunted field necessarily means some additional complication of the control. With the tapped field it is sometimes possible to use a rather lower speed gearing than would otherwise be the case, thereby reducing accelerating current and resistance losses and giving a lower power consumption. The reduction of the heating effect on the motors and the use of a lower gear speed may possibly permit the use in some cases of smaller motors. Many equipments operating in cities on schedules having a large number of stops per mile are used for interurban running on schedules where the number of stops is very much less. Under these conditions field control affords a saving of from approx-

imately 5 to 8%. For strictly interurban work, however, it is generally considered that saving in energy effected by the tapped field is not sufficient to warrant the increase expenditure and complications.

A very large percentage of the railway motors in use throughout Canada are of the split frame type. The box frame type has numerous advantages over the former and we can safely predict a steady increase in the number of box frame motors used, especially in the larger sizes for the heavier classes of service, although one of our roads has already adopted this type in 40/50 h.p. rating. Eighty to ninety per cent. of the railway motors building at present by one of the large electrical manufacturing firms in the United States are of the box frame type, and of the percentage of split frame motors, 19 out of 20 are under 40 h.p. rating. Many of our railway companies doubtless prefer the split frame type of motor, as their shop facilities are unsuited to readily lifting car bodies and motors from the trucks; however, the matter is worthy of serious consideration in view of the advantages possessed by the box frame type over the split frame type. These principal points of superiority are: For any given capacity the box frame motor can be made lighter in weight, smaller in overall dimensions, and of more rugged and durable construction. The box frame overcomes trouble occasioned in the magnetic circuit by dirt and oil getting between the halves of the split frame, trouble with field coil jumpers, and with oil working into the frame from the axle caps. The box frame also has the advantage over the split frame in a number of mechanical points.

The gear and pinion being integral parts of the motor, it is interesting to note that maintenance on these, as well as the labor in breaking down and assembling when changing, has been very considerably reduced by the use of tool steel, oil tempered forged, heat treated, and armored gears and pinions. With regard to the gear ratio to be selected for a given service, the possibilities of securing a saving in power consumption by exercising care in the proper selection of ratio are much greater than is ordinarily appreciated.

With many of the older types of motors, before grooving of the commutator segments was adopted, the commutators had to be frequently sandpapered or turned. The wear was so rapid that it was considered good practice to make the segments very deep, a wearing depth of 1¼ in. not being considered excessive. With the modern commutating pole motor the wear on the commutators is usually so slight that after a year's run it can hardly be detected. Ten mils wear in a year is not an exceptionally low figure, at which rate a ½ in. wearing depth of copper will last for 50 years.

Reduction in brush wear has kept pace with reduction in commutator wear. I have inspected some equipments that averaged over 250,000 miles a car. The original motor brushes were still in use and showed about one quarter of an inch wear. The original compressor brushes were also running. These cars had not

received special treatment in any way, the practice of the road being to thoroughly clean and inspect the equipments on a 1,500 mile basis, and to give them a general overhauling on a 45,000 mile basis.

In the modern railway motor the armature and axle liners are liberally designed; and a direct result of this, combined with modern methods of waste lubrication, is the increased life of, and the decreased attention required by, the liners. In the earlier motors it was the practice to lubricate bearings every night, and from 10,000 to 20,000 miles life of armature liners was considered normal. Modern motors are lubricated once in 10 days to 3 weeks, and the life of the liners has increased in many cases to 200,000 miles. Improvements in material and manufacture, as well as in design, have contributed to these results. It has been found good practice to set the maximum allowable wear of armature liners at 1/16 in. and axle liners at 1/8 in.

Every detail in the design of the modern railway motor is a case of the survival of the fittest. Only through repeated trials of various designs has it been possible to select the best types for this exacting service; and as a result motors which a few years ago represented a high standard of design have been superseded by others able to perform their work with greater economy and lower maintenance costs.

With reference to motors designed for operating on line voltage higher than 600 volts. Two roads in Canada are now operating on 1,500 volts d.c.—the London & Port Stanley Ry. and the Lake Erie & Northern Ry., and the Toronto Suburban Ry. will shortly be added to the list. The Canadian Northern Ry.'s Montreal tunnel zone will operate both locomotives and car equipments on 2,400 volts d.c. The operation and maintenance of the higher voltage motors have proved to be quite as satisfactory as in the case of the modern railway motor operating at 600 volts. For operation on a 1,500 volt line the motors are wound for 750 volts each and insulated for 1,500. This arrangement permits operation on 600 volt connecting lines. For 2,400 volt operation the motors are wound for 1,200 and insulated for 2,400 volts. In all cases where designed for operation on these higher voltages, the motors conform mechanically and electrically to the best modern practice.

(To be concluded in next issue.)

Toronto Civic Railway Earnings, Etc.

Following is a comparison of the earnings and mileage for the years 1915 and 1914:

	1915.	1914.
Passenger revenue.....	\$198,320.87	\$166,994.88
Advertising.....	968.03	
	\$199,288.90	\$166,994.88
Mileage.....	1,219,984.4	1,097,088
Passengers.....	11,712,390	9,829,766

The Bloor St. line did not start operation until Feb. 23, 1915.

Toronto & York Radial Ry. Appeal.—The T.&Y.R.R.Co. has decided to appeal to the Imperial Privy Council against the Ontario Appellate Court's decision refusing the company's Metropolitan Division the right to cross Yonge St., at Farnham Ave., Toronto, to the proposed new terminals there. The Ontario Railway & Municipal Board decided that the company might make the crossing, but the Appellate Court reversed this.

Proposed Hydro Electric Radial Railways in Western Ontario.

It was announced in Toronto, Mar. 8, that the Hydro Electric Power Commission of Ontario had completed surveys and estimates of the cost of construction, with traffic data, for a number of proposed electric railway lines in western Ontario. These figures relate to the following districts: Toronto, Port Credit and Oakville to Hamilton; Hamilton, Grimsby and St. Catharines to Niagara Falls; St. Catharines, Welland and Port Colborne; Dunnville, Port Colborne, Fort Erie, Bridgeburg and Niagara Falls; Elmira, Waterloo, Berlin, Preston, Galt and Hamilton; Owen Sound, Chesley, Brussels, Seaforth, Woodham and Kirkton, connecting with the St. Marys-Stratford-Toronto line. When the figures are got into proper shape they will be submitted to the various municipalities concerned, with copies of the bylaw as voted on in other localities, for further action. A portion of the foregoing, viz., that between Toronto and Port Credit, is covered by the Toronto-London line already voted on, and as a matter of fact, is a part of the Toronto & York Radial Ry., which, it is said, the Commission proposes to purchase, together with the Toronto Suburban Ry. extension from Lambton to Guelph.

The bylaw relating to the Toronto-London line was re-submitted to a vote of the ratepayers, in Blanshard Tp., Mar. 13, the voting being 165 for, and 142 against. When it was voted on Jan. 3, the voting was 102 for and 158 against.

●Lethbridge Municipal Railway Operating Results.

Following is the statement of the Lethbridge, Alta., Municipal Ry. for the calendar year 1915:—

EARNINGS	\$41,740.51
EXPENDITURE—	
Motormen's wages	\$10,996.75
Salaries	1,683.75
Power	14,864.80
Auditors	245.40
Employees' insurance	144.21
Uniforms	340.21
Car barn foreman	1,320.00
Car barn wages	2,784.50
Track cleaning	1,516.94
Car barn expense	572.79
Car heating	206.00
Damages	156.32
Repairs overhead	220.11
Stores	1,398.55
Repairs track	1,080.65
Advertising	92.91
General expense	163.03
Amusements	33.29
Printing and stationery	158.09
Office expense	84.57
Surplus from operation	\$38,062.87
	3,677.64
	\$41,740.51

OVERHEAD CHARGES

Debenture interest	\$18,801.50
Sinking Fund	8,756.28
Taxes	5,143.19
Insurance	682.40

Income from operation	\$33,383.37
Income from other sources	29,705.73

Saskatoon Municipal Ry.—The receipts for the first 51 days of the current year, were \$27,391.45, against \$17,970.30 for same period 1915.

The cost of operating the special market cars on the Calgary, Alta., Municipal Ry., is \$70 for the two days a week on which they are run, and this was on Mar. 4, transferred to the market account from the street railway account on Commissioner Graves' recommendation.

Additional Car for Toronto Civic Railway.

The Toronto Works Department received tenders to Mar. 14, for the supply of one single truck, double end city car, completely equipped and ready for operation for the Bloor St. division of the Toronto Civic Ry. We have been advised that the contract will be awarded early in April. The specification provided for a car with single arch roof with platform arranged for separate entering and leaving of passengers and to permit of fare collection as passengers enter the car. The bottom framing is to be of steel, the side members to be of steel plate reinforced at bottom by steel angle and rivetted to side sill plate. The sill is to be of steel plate reinforced at bottom edge by steel angle, the platforms with steel knees sheared to shape and reinforced top and bottom by angles. bumper of 6 in. channel from knee to knee and conforming to the shape of the vestibule, with anti-climber section, 3½ ft. long placed on face of each bumper. Steps 11 in. wide, to fold and work in unison with the doors, step to be entirely down when door is open sufficiently wide for passengers to alight, the mechanism to be of the same type as now in use on civic railway cars. There are to be no bulkheads in ends of the car. The interior finish is to be of quartered oak throughout, dull finish. Three automatic ventilators to be provided on each side of the roof, with openings 5¼ by 7¼ ins. with rounded tops on the roof. Eight windows on each side of car at 30¼ in. centres, the lower sash to drop into a well and the upper sash to remain stationary. The seating accommodation to consist of eight transverse seats of the walkover type, and four longitudinal seats, the latter to be closed underneath. The following specialties are also specified, Headlight, Crouse-Hinds type; electric bell circuit and heating; Consolidated Car Heating Co.; fare boxes, Coleman Farebox Co's type 4, as now used on the civic cars. The motors to be of the Westinghouse 533-T-4 fully ventilated interpole type. The trucks to be 8 ft. wheel base, journals 4¼ by 8 ins., car wheels, chilled cast iron, open spokes, 33 ins. diam. The dimensions of the body are as follows:

Length	34 ft. 8½ ins.
Length of vestibule.....	6 ft. 4¼ ins.
Length of car over all.....	34 ft. 8½ ins.
Width of car over sheathing.....	8 ft. 5½ ins.
Height from rail to top of roof.....	10 ft. 9½ ins.
Height from rail to top of vestibule step.....	13 ins.
Height from top of step to floor of vestibule.....	12 ins.
Height from floor of vestibule to floor of car.....	11 ins.
Weight of car body not to exceed.....	13,500 lbs.

Regina Municipal Railway Earnings, Etc.

Following are earnings, expenses and other statistics for January, compared with Jan. 1915:

	1916.	1915.
Total revenue	\$16,746.87	\$15,093.51
Operating expenses.....	19,281.31	17,965.87
Operating deficit	11,001.05	12,009.90
without power.....	21.35c.	17.15c.
with power.....	28.80c.	22.41c.
Platform wages per car hour.....	75.71c.	78.36c.
Passengers carried.....	360,263	323,184
charges, percentage....	115.13	
Expenses, with capital charges, percentage....	165.69	

Calgary Municipal Ry. Finances.

The financial condition of the Calgary, Alta., Municipal Ry. is again attracting attention, and the Calgary Herald of Mar. 6 said editorially:—

"The deficit for January was very much larger than appears to be healthy, and at the same time there seems to be no remedy in sight. The internal management of the system, as far as the Herald can see, has always been excellent. Mr. McCauley has proved an efficient as well as an economical superintendent, and his reports show that he is keeping his expenses down to the lowest possible figure. The whole trouble is that the railway has been loaded up with outside extensions, due to the rapid spreading out of the city in more prosperous times. Many of these extensions are such as a private company, if it had a franchise in Calgary, would most certainly have refused to build. It is true that they are a great convenience to those citizens who live in the outlying sections, but it is equally true that when they were built they brought little or no additional revenue to the system. But having built these extensions, the city is now morally bound to continue to operate them, even if there is a loss in doing so. . . . The commissioners are now faced with the problem of either doing away with the working men's tickets during the early morning and the evening hours or of reducing the amount annually charged to depreciation, so as to swallow up these constantly recurring deficits. . . . It is quite a serious problem which the commissioners and the city council have to deal with and one that will require a good deal of consideration before a decision is reached."

Jitney Traffic Notes.

The Sargeant Jitney Association of Winnipeg put in force Mar. 1, a rate of 6 rides for 25c, good on any of its 28 cars, in place of the former straight 5c fare.

The municipality of Oak Bay, near Victoria, B.C., proposes to regulate motor and jitney traffic and on Mar. 1 took up the consideration of a bylaw framed on similar lines to that in force in Victoria. The amount of the bond which each licensed driven will have to put up is \$5,000. The Victoria Jitney Association is assisting the jitney men of Oak Bay in an endeavor to have the bylaw modified in a number of its details.

Rates for Special Cars.—Responding to questions in the American Electric Railway Association's question box, G. Gordon Gale, General Manager, Hull Electric Co., Hull, Que., states that his company has only one rate for special or private cars. It is based on the seating capacity and no standing passengers are allowed, and for the first fare zones of four miles, is \$5 one way, \$8 return; for the second fare zone, \$6 one way, \$10 return; for half an hour, \$1 per hour or portion thereof, and for a directors', or so called parlor car, the charge is \$2 a trip additional. In all cases there is a fixed limit as to the number of passengers allowed.

Toronto Civic Ry. Deficit.—A Toronto alderman has given notice that in order to reduce the present large annual deficit in operation he will move that the fares be as follows: Cash fares—Adults, 3c. each; children, 2c. each; infants in arms, free. Tickets good every day in the year. Adults, 10 for 25c.; children's, 6 for 10c.

Work Car, Snow Plough and Sweeper, Port Arthur Civic Railway.

The accompanying illustration shows a combined work car, snow plough and sweeper designed by the Master Mechanic, F. Philp, and built in the Port Arthur, Ont., Civic Ry. shops. It is 45 ft. long over all, and 31 ft. with plough and sweeper removed. It is mounted on no. 27 G-i-e-trucks, equipped with 4 Westinghouse 101 B2 500 volt motors, Westinghouse air brake equipment and hand brake.

The plough is lowered and raised by means of a hand brake, its own weight holding it in position when lowered. The wing is operated by a 3½ h.p., 500 volt motor, and when out to its fullest extent cleans off a strip 14 ft. outside of track. The wing can also be raised to a height of 8 ft. of the extreme end, which has a great advantage in cleaning down heavy snow drifts. The broom is operated by a Westinghouse 12a-500 volt motor. Both broom and motor are on a special platform, which can be removed when not in use. All the appliances are operated from the cab, which is mounted



Work Car, Snow Plough and Sweeper, Port Arthur Civic Railway.

on the front end of the car, and the running of the machine and equipment can be controlled by two men.

Toronto Civic Railway's Deficit.

The Toronto Daily Star says: "Toronto's Civic Ry. went into the hole to the extent of \$380,000 last year despite the fact that the revenue rose from \$166,990 to \$199,300, an increase of 19.3%. The new Toronto transporting commission will have to face the problem of civic car fares as one of its most important duties. With civic revenues failing on all hands, and expenditures going up by leaps and bounds—largely due to Toronto's solicitude for her sons who enlist and those who are quartered within her gates—it is agreed that the time has come when every revenue-producing service should be made to stand on its own feet."

"The T.C.R. is already becoming known as the Toronto Charity Railway. The fare fixed upon by the city council, when the civic car line commenced operation, was 2c. cash, or 6 tickets for 10c. A glance at the average fare collected in 1913, 1914, and 1915, shows that very few passengers pay for their ride in cash. If everyone used the little green ticket, the average fare would work out at 1.66c. In 1913, the average fare was 1.71c.; in 1914, it was 1.69c., while last year it was 1.70c. The annual deficit has more than doubled in three years of operation. At the end of 1913, it totalled \$154,317.

"Works Commissioner Harris has always stood for a 3c. fare on civic cars, declaring that such a fare, while not returning a profit, would carry the system. The council, however, whenever it has been asked to vote on the question, has been overwhelmingly opposed to the increase. At this time last year when civic financing was causing some anxiety, the works committee, by a vote of 6 to 5, carried the Commissioners' recommendation. At the next meeting of council, however, the vote was so overwhelmingly opposed that it was impossible to record it."

"The patronage of the civic cars has increased by leaps and bounds. Last year nearly 2,000,000 more passengers were carried than in 1914. While the number of passengers carried by the Toronto Railway Company showed a marked decline, there was an increase of 19.1% on the civic cars."

Electric Railway Notes.

The Toronto Suburban Ry. is going to erect an office building on Keele St., West Toronto.

The Sandwich, Windsor & Amherstburg Ry. is in the market for two cars, duplicates of the last ordered.

Over 500 Winnipeg Electric Ry. employees were reported, Mar. 31, to have enlisted with the Canadian Expeditionary Forces.

Express and freight services were established on the Lake Erie and Northern Ry., between Brantford and Galt, Ont., Mar. 1.

At the recent examinations of the British Columbia Electric Ry. first aid class the St. John Ambulance Association, 11 certificates were granted.

A London, Ont. Street Railway motor-man was fined \$5 and costs, Mar. 14, for running his car into the rear of the 142nd Battalion while it was on a route march.

The Winnipeg Electric Ry. expects to start running cars over Arlington Bridge, Winnipeg, early in April, under terms approved by the Manitoba Public Utilities Commission.

The city of Winnipeg, Man., is considering the question of abolishing the position of Traffic Superintendent. This officer looked after traffic on the Winnipeg Electric Ry. for the city council.

The Toronto Suburban Ry. is having two cars built for service between Toronto and Cooksville similar to those which were built there a short time ago for service between West Toronto and Woodbridge.

The Montreal city council is considering the construction of a subway under

the Lachine Canal on Wellington St., at a cost of \$1,200,000 towards which the Montreal Tramways Co. is to be asked to contribute.

Owing to heavy snow fall in the early part of March, the Port Credit Division of the Toronto & York Radial Ry. was snowbound for two days. The portion of the line between Long Branch and Port Credit is somewhat exposed and consequently suffered from drifts.

The Hamilton St. Ry. employees, whose wage agreement expires Apr. 1, are asking for an increase in pay of 7c. an hour, to make the rate 35c., instead of 28c. They are also asking for an eight hour day instead of ten hours, and for the elimination of special early morning cars.

The Brantford, Ont., Municipal Ry. Commission has declined to grant passes to the aldermen and civic employees. When the matter was discussed at a meeting of the council recently, it was stated that in Guelph, the commissioners managing the Guelph Radial Ry. pay their fares on it.

A Mexico dispatch, Mar. 16, says the Mexico City Electric Tramway system, which was taken over and operated by the Constitutional Government over a year ago has been returned to the company, the directorate of which includes: Z. A. Lash, K.C., M. Lash, R. C. Brown, E. R. Wood, J. S. Lovell, Toronto.

The Toronto Ry. is giving preference, in connection with applicants for positions as motormen and conductors, to soldiers who have returned from the front, to men who have applied for enlistment but have been unable to pass the military physical test, and to men past the age for military service, in the order named.

The city solicitor of Hamilton, Ont., has been authorized to prepare the city's case against the Hamilton St. Ry., as to overcrowding, etc., for submission to the Ontario Railway and Municipal Board, and the Mayor stated Mar. 11, that the Street Railway Committee was about to make a revision of the street car service bylaw, so as to make overcrowding impossible.

The members of the public utilities committees of Fort William and Port Arthur, Ont., held a joint meeting in Port Arthur, Mar. 8, to discuss street railway rates between the two cities. Propositions were submitted for 6 tickets for 25c and for a 10c fare, while other members advocated the retention of the present 5c rate. It was arranged to hold another joint meeting about the end of the month to consider reports of travel that crosses the boundaries.

Employees of Brantford, Ont., Municipal Ry. are asking for an increase of pay over the 15c and 20c an hour they now receive, and for a reduction of hours, and the motormen in addition ask to be provided with stools in the vestibules. At a conference Mar. 9, the question of shorter hours was withdrawn, and the commissioners promised to give an answer as to increase of wages April 1. The men promised to submit a sample stool for motormen which it was thought would meet the objection of the Board of Railway Commissioners' inspector that their use was liable to cause accidents.

The Lethbridge, Alta., Municipal Ry. issued a notice Mar. 7, putting in force a new schedule to come into effect Mar. 8. It read: "Commissioner Freeman finds that the new car schedule is not working out satisfactorily. While the receipts

from the red line have increased, due to change of conditions, the blue line receipts have fallen off in greater proportion, and at the same time the operating expenses are higher. The returns from the extra car on the red line do not warrant its operation during the morning hours, and it is not found desirable to run through schedule from loop to loop for the reason that when anything happens to put one car out of time or service, the whole service is disorganized." The schedule put into effect Mar. 8, gives the following service: The blue North Lethbridge line operates from corner of 3rd Ave. and 5th St. to the North Lethbridge loop and return on a 12 minute schedule; the white line runs as heretofore; the red Park line has one car only up to noon on a 32 minute service, and two cars for the balance of the day, on a 16 minute service.

Opposition to Extension of Railway Charters in Niagara Peninsula.

The proceedings before the Railway Committee of the House of Commons in regard to the Toronto, Niagara & Western Ry., and the Niagara, St. Catharines & Toronto Ry. applications for extension of time for the building of their lines, which are being considered together, had not been terminated at the time of writing, Mar. 25, both bills being down for further consideration on Mar. 28.

The charters of both these companies are held by Canadian Northern interests. There are two points to which opposition to the extensions of time is directed, in the first of which the City of Toronto is concerned, and which has to do with the power which both companies possess to build a line into Toronto. The second point is the building of electric railways from Toronto to Windsor, via Hamilton, Brantford and London, and from Hamilton to St. Catharines, in the case of the Toronto, Niagara & Western Ry., and from Port Colborne to Fort Erie and on to Niagara Falls, from Welland to Brantford, and from the old Niagara Central Ry. to Fort Erie, in the case of the Niagara, St. Catharines & Toronto Ry. The opposition comes from the Ontario Government, the Hydro Electric Power Commission of Ontario, the Hydro Electric Railway Association of Ontario, the City of Toronto, and some other municipalities through which the proposed lines would pass. It was arranged in the course of the discussion that the section giving the Niagara, St. Catharines & Toronto Ry. power to build from St. Catharines to Toronto via Hamilton be withdrawn, and a promise was given that running powers over the Toronto, Niagara & Western Ry. would be granted to the hydro electric lines.

On behalf of the Hydro Electric Power Commission of Ontario, Sir Adam Beck stated that the commission had bought the greater part of a right of way between Port Colborne and Fort Erie, and that there is only room for one line there, and he claimed that this line is vital to the hydro electric railway system. He also offered to haul the company's cars over that section.

The following statement was made by D. B. Hanna, Third Vice President, C.N.R., Mar. 17: "The Toronto, Niagara & Western Ry. is designed for a fast main line service connecting up our service with the frontier. It is proposed that this line will come into Toronto over the location already approved for the C.N.O. Ry. That means, therefore, that there will be but

one line into Toronto from the west, so far as the C.N.R. is concerned. There was no discussion with the civic officials as to the elimination of the right to operate electrically. All we told the city's representatives was that we were converting this electric charter into a steam charter by removing the statutory prohibition on the use of steam. All railways in Canada, including the C.P.R., G.T.R., and ourselves, have the right under the Railway Act to operate electrically, and the modern tendency is toward electrical operation of even through lines such as we propose to construct under this charter. It never was our intention to build two main lines between Toronto and Hamilton, nor to have two entrances into Toronto. Our purpose in renewing our Toronto, Niagara & Western charter was simply to facilitate construction. The C.N.O.R. location as at present approved runs from the vicinity of the new North Toronto Union Station westerly, paralleling the C.P.R. to about Dovercourt Road, and from there runs directly toward the new Toronto Suburban Ry. bridge over the Humber near Lambton, which will be used jointly by the Toronto Suburban and Toronto, Niagara & Western. The necessity of connecting the system with the U.S. border has been for years of paramount importance, and at present it would seem that the company's plans are capable of being carried into effect promptly."

In the course of the hearing, Mar. 23, Mr. Hanna stated that the controlling interests had built 76 miles of line, feeding over 100 industries, and tributary to the Canadian Northern system, and that running rights over the hydro electric lines would not be satisfactory, as he claimed the resulting traffic for his company, which naturally desired to earn all the revenue.

On Mar. 28, both bills passed the railway committee, with some amendments. Clauses giving the companies the right to sell power were deleted, the undertaking of the Toronto, Niagara & Western Ry. relating to the entrance to Toronto over the Canadian Northern Ontario Ry. was incorporated in the bill, and a clause was added making the line a constituent part of the security given for loans by the Dominion. In the Niagara, St. Catharines & Toronto Ry. bill, the portion relating to the proposed construction between Port Colborne and Fort Erie was struck out.

Winnipeg Electric Ry. Co. Dividends.—The following official statement has been issued:—"At a meeting of the board it was decided that owing to the financial situation the practice of declaring a quarterly dividend has been discontinued for the present. In this connection I would say that the business of the company is showing an improvement, and for the current quarter the net earnings have been sufficient to provide for all accrued fixed charges and also a sum that would have been sufficient to enable the company to declare a moderate dividend for this quarter. Directors feel that at this time, in order to conserve the company's interests, a dividend should not be declared payable for the present quarter and that the matter of further dividends for the year will be considered and dealt with at a later date."

Design of Passenger Terminals.—J. J. Busfield, Assistant Engineer, Mackenzie, Mann & Co., Mount Royal tunnel construction, has written a paper on this subject to be read before the Canadian Society of Civil Engineers.

Brantford Municipal Railway and Grand Valley Railway.

It, passing through the House of Commons, the City of Brantford's bill, respecting the Grand Valley Ry., was amended by having its title altered so as to make it read,—An act to enable the City of Brantford to operate the Grand Valley Ry. The act provides that the city may operate the railway between Brantford and Galt, and may extend it to Cainsville in Brantford Tp., under the name of the Brantford Municipal Railway. The railway is to be liable to pay taxes in any municipality through which it passes as if it was owned by a private company. The railway is to be managed by a commission, a bylaw of Nov. 28, 1915, appointing the same being confirmed. The commission has power to act under the bylaw. Any member of the commission removing from Brantford shall be deemed to have resigned and the city council shall at once fill the vacancy. The city may make agreements with other railways for the sale of the line or any part thereof and for other purposes as authorized by the Railway Act. The city council may pass a bylaw to merge the railway management with the duties of any other committee managing a public utility. The Railway Act is made generally applicable. The powers conferred by sections 136 to 139, both inclusive, of the Railway Act may be exercised by the corporation and not by the commission. The city council may issue bonds and mortgages and borrow money. A schedule attached to the act contains the bylaw providing for the Brantford Municipal Railway Commission of three members to be elected by the ratepayers at the municipal election in January of each year.

The Brantford City Council had before it on Mar. 6, a report of the finance committee as to the terms of settlement of all outstanding matters between the city and the commission. The terms of settlement had been agreed to and were adopted by the council. It is provided that the \$30,000 to be paid by the Lake Erie and Northern Ry., for the Grand Valley Ry's, Galt-Paris section, shall be used by the city in liquidation of the \$28,584.28 due the city for arrears of taxes, etc., and that any balance be held for further capital requirements of the railway, the surplus revenue for 1915 over and above the \$9,000 already paid to the city treasurer, which the annual report shows to be \$4,799.44, is to be paid to the city treasurer and applied towards the payment of interest and sinking fund indebtedness for 1915, amounting to \$10,579.99; the commission is hereafter to pay to the city treasurer the revenues of the railway, after deducting disbursements, on Jan. 15, April 15, July 15, and Oct. 15, and in each year, which revenue is to be used by the city treasurer to pay interest on the \$125,000 bond issue, sinking fund on city debentures, and paying tax instalments, and any balance over is to be applied to any balance remaining on the \$10,579.99 liability mentioned above. After the various charges against revenue have been met balances are to be at the disposal of the commissioners for replacements and betterments. When extensions of the system are found to be necessary bylaws will be passed by the council to provide the funds; no taxes for general purposes shall be levied against the railway except the pavement tax, or other local improvement taxes; the cost of

further pavement improvement to be a matter of arrangement between the city council and the commission.

The question of the projected extension to Cainsville was mentioned, and A. K. Bunnell, City Treasurer and ex-commissioner, explained that when the city acquired Mohawk Park, it secured a right-of-way along the canal bank. In the course of time the city might want to extend the line on this right-of-way to the Glue Co. road and back again to the city by way of Eagle Place. Cainsville was simply mentioned so as to have the power, and the commissioners have intentions of building immediately.

The question of the extension of the line to Terrace Hill is under consideration. (Mar. pg. 115.)

Toronto Advisory Transportation Commission.

The Toronto City Council has appointed an advisory commission to deal with the city's transportation methods and systems. The commission consists of the Mayor, one member of the city council, the Commissioner of Works, the Corporation Counsel, or in his absence, the City Solicitor, the City Engineer, the Chief Engineer of the Toronto Harbor Commission, and the General Manager of the Toronto Hydro Electric System. The duties are defined as follows: To advise the city council as to the proper steps to be taken, and to prepare the way for the taking over of the Toronto Ry. in 1921, and for the termination of the Toronto Electric Light Co's franchise in 1919; to advise as to radial railway problems within the city and as to general transportation problems, improvements in transportation facilities, necessary expenditures in connection with the foregoing, as to the administration and control of the civic railway system, the exercising of authority over the regulation of transportation matters in the city and any other matters which might be referred to the commission by the council from time to time.

The duties of the commission are purely advisory, and the term of office proposed is until the taking over of the Toronto Ry., which is scheduled to take place in 1921, when the franchise expires.

The St. John Railway's Franchise and Rights.

An agreement has been reached between the St. John Ry. and the City of St. John, N.B., clearing up all matters in dispute between them as to the company's rights under its franchise. The chief dispute centered round the matter of track reconstruction, the type of foundation to be provided, the use of T rail or grooved rail, and the question of grades. These matters have been argued and discussed for some time, and culminated last autumn in a suit by the railway company against the city for damages for an interruption of its service, for a declaration of rights, and for an injunction restraining the city from interfering with the company. When the case came up, it was agreed between the parties concerned that four questions should be submitted for judgment, these questions covering the points at issue. Of three of the questions upon which judgment was given, the verdicts were unquestionably in favor of the company, while on the fourth question, which dealt with the city requiring the company to

restore its tracks from time to time to grades as established by the city, it was held that the city had the right to alter the grades of the streets, and the company must restore its tracks to the levels of the new grades.

The agreement now reached provides for the withdrawal of all legal processes, the company to pay the city at the rate of \$5,000 a mile for concrete work under the tracks, which will be carried out by city labor. The company is relieved of having to relay its track to a grade about which there might be two opinions from an engineering point of view, and agrees to an extension of the term during which the company pays for the removal of snow from its tracks, from Apr. 1, 1918 to Apr. 1, 1923. The company releases the city from any costs or damages in cases heard, and consents to a dissolution of the existing injunction.

Sale of Peterborough Radial Ry. and Allied Power Properties.

It was announced in Toronto, Mar. 10, that an agreement had been completed between the Ontario Government and the Electrical Power Co. Ltd., for the purchase of the latter's entire business and assets for \$8,350,000, payable in 4% government bonds. Twenty-two properties are included in the purchase among which is the Peterborough Radial Ry Co., and it is stated that the amount mentioned as the purchase price represents the amount of cash invested in the enterprises. In making the official announcement in the Ontario Legislature, the Minister of Lands and Forests, said that the Government had for a long time proposed to serve central and eastern Ontario with power, but the question had arisen as to the water powers on the Trent River, and to secure control of these negotiations were opened with the Electrical Power Co., to acquire its holdings. The Hydro Electric Power Commission of Ontario intends to make the whole power of the Trent River available to the public on the same basis as obtains in western Ontario with Niagara power supplied through the commission. There are certain undeveloped power projects on the Trent River, for which the Dominion Government has been negotiating, and it expected that these will be obtained from the Dominion by the Province and incorporated under the one system. The companies included in the purchase are, Auburn Power Co.; Central Ontario Power Co.; City Gas Co.; Oshawa; Cobourg Utilities Corporation; Cobourg Water and Electric Co.; Cobourg Gas, Light and Water Co.; Eastern Power Co.; Light, Heat and Power Co.; Lindsay; Napanee Gas Co.; Napanee Water and Electric Co.; Nipissing Power Co.; Northumberland Pulp Co.; Oshawa Electric Light Co.; Otonabee Power Co.; North Bay Light, Heat and Power Co.; Peterborough Light, Heat and Power Co.; Peterborough Radial Ry.; Port Hope Electric Light and Power Co.; Seymour Power and Electric Co.; Trenton Electric and Water Co.; and Tweed Electric Light and Power Co.

The Peterborough Radial Ry. Co., was incorporated under the Ontario Companies Act, Mar. 17, 1902, to build and operate by electricity or other motive power except steam, a railway in Peterborough and Ashburnham and from either place through Lakefield and Douro or Smith Tps. to Clear Lake, and from Peterborough through Smith Tps. to Chemong Lake, and through Monaghan

Tp. to Otonabee River, and from either of the first named starting points to Rice Lake. The capital stock was fixed at \$500,000, and the head office at Peterborough. Further power was granted in 1906, to extend the line from Clear Lake through Douro and Dummer Tps., or Smith Tp., to Stony Lake, and in 1914, the company was empowered to issue bonds or other securities to the extent of \$35,000 a mile for each mile of single track, instead of \$20,000 as formerly authorized. The track actually built is all within the city limits of Peterborough and consists of 6.04 miles of main line. The last statistics available are for the year ended June 30, 1914, and show that the gross earnings from operation were \$47,615, operating expenses \$29,566; taxes, funded debt, etc., \$6,690; net income \$11,034; total car mileage 280,092; fare passengers carried 1,060,499.

Compensation for Injuries in the Queenston Accident.

The International Ry. of Buffalo, N.Y., which operates the Niagara Falls Park and River Ry. in Canada, is said to have paid upwards of \$30,000 for damages, for injuries to children alone as a result of the Toronto church picnic excursion wreck at Queenston Heights, Ont., July 7, 1915. It is said that other sums have been paid in settlements which were not taken into court. In 22 cases have settlements for various sums been ratified by the courts. They are as follows: Beatrice Goodman, \$250 and medical expenses; Elizabeth Harris, \$400 and medical expenses; Annie Hall, \$100; Emily Hall, \$425; Beatrice Hall, \$125; J. R. Hall, \$100; Geo. L. Walters, \$1,500; Calvin de Witta, \$300 and \$180 for medical expenses; Wm. Mitchell, \$350; Norman A. Bent, \$325 and \$205 for medical expenses; Louise Symonds, \$325; Hazel Deverning, \$405; Bessie B. Yule, \$350; Sarah Grelman, \$650 and \$425 for medical expenses; Earl A. Russell, \$700; Harold F. Hargraves, \$400; Wm. C. Keates, \$3,000; Gordon Dowling, \$700; Ralph, Rayner, \$500; Fred Draper, \$800; Calvin J. Sloan, \$1,800; Hannah Crombie, \$1,500; J. E. Hall, \$120; Katie Grant, \$8,855; Janet Rayner, \$2,500; Gladys Newton, \$1,500; Costs, etc., are said to have brought the total up to \$30,790.

Increased Service on British Columbia Electric Ry.—A circular issued by W. G. Murrin, General and Mechanical Superintendent, on Mar. 10, gave details of alterations and improvements in the services on the company's lines in Vancouver, New Westminster and other mainland points, which were put into effect Mar. 15. The circular said: "At a heavy cost the experiment of increased service is being carried out, and if it is found that increased travel can at all justify this experiment it will be maintained. The cost of operating cars is a subject to which the general public naturally does not give much attention, but perhaps it will indicate the fact that improvements in service mean additional expense to the company when I state that these changes represent, as additional out of pocket expenditure, without allowing any cost for power consumed at all, of upwards of \$40,000 a year, compared with the service in operation prior to Mar. 15. It is not, therefore, unreasonable to expect that additional travel should result from these improved services which will make it possible to continue and perhaps still further improve in certain directions."

Hydro Electric Power Projects at Edmonton.

The Edmonton, Alta., City Council has passed a bylaw repealing the bylaw previously passed, after having been approved by the ratepayers, agreeing to grant a franchise to the Edmonton Power Co. for the delivery in the city of electric energy. The passing of the original bylaw was secured after considerable opposition, and since it was passed there have been some negotiations in the way of concessions being granted by the company, these negotiations taking a more definite form after the proposition of the Alliance Trust Co. to supply power developed by natural gas. A letter from G. W. Farrell, Montreal, representing the Edmonton Power Co., and dated Feb. 13, outlined several modifications of the agreement, and some counter propositions were made by the city power committee. No agreement was reached and the bylaw repealing the original bylaw was passed, only two aldermen voting in its favor. The City Clerk subsequently notified the Clerk of the Provincial Legislature of the action of the council, in view of the fact that the E. P. Co. is applying to the Legislature for confirmation of the agreement.

The Dominion Parliament is being asked to incorporate the Edmonton & Southwestern Ry. Co., to build a standard gauge railway from Edmonton southwesterly to the Saskatchewan River at Blue Rapids, 70 miles. The consent of municipalities must be obtained for the construction of the railway on any highway, street or public place within their jurisdiction. The company also desires to have power to operate steam and other vessels, to build wharves, docks, elevators, warehouses, etc., and may acquire, but not by expropriation, water powers for the development of electricity, and may transmit and distribute electric power, or it may grant an easement on its right of way for a power transmission line. The provisional directors are: H. A. O'Meara, G. W. Farrall, Montreal; T. A. Burgess, L. Cote, R. H. Pringle, Ottawa. This is the railway proposed to be built by the Edmonton Power Co. interests in connection with a hydro electric power plant at Blue Rapids.

The Alberta Legislature is being asked to confirm an agreement between the Edmonton City Council and the Northern Alberta Natural Gas Development Co. for the supply of natural gas for lighting and power within the city. This is said to be the company in which the Alliance Trust Co. is interested and for which larger proposals are being made to the city council in opposition to the Edmonton Power Co.'s proposals.

Hamilton Street Railway Wages.

Negotiations between the Hamilton St. Ry. and its conductors and motormen have resulted in a new agreement being entered into for two years from April 1. The following table shows the rate paid up to Mar. 31, the rate asked by the men, and the new rate agreed to.

	Old Rate	Rate Asked	New Rate
1st. year.....	20c	25c	22c
2nd. year.....	22c	28c	24c
3rd. year.....	25c	30c	28c

Overtime and Sunday work will be paid 2c an hour extra, 25c being the minimum amount for any one run. Extra conductors and motormen who report at car barns, and relief changes, are guaranteed minimum wages of \$6 a week unless they fail to report at any time during the week.

The Toronto Railway and the Toronto City Council.

At a meeting of the Toronto Board of Control early in March, it was decided to proceed with the preparation of an indictment against the Toronto Ry. for maintaining a nuisance by allowing overcrowding on its cars. The company has already been indicted on two occasions, and a conviction stands against it for overcrowding, but this is under appeal. In the meantime, the company is acting under orders from the Ontario Railway and Municipal Board in providing increased accommodation, and the time allowed under this order has not yet expired. The getting together of evidence on which to apply for an indictment was urgently pressed by the Mayor, notwithstanding the advice tendered by the legal department as to the standing of the matter under the previous proceedings and the Ontario Railway and Municipal Board's order. A conference took place between the General Manager, Toronto Ry., and the Board of Control, Mar. 13, to see if some arrangement could not be made whereby matters in dispute between the company and the city could not be settled without recourse to litigation. After some consultation, the Board of Control decided not to proceed with the application for an indictment for overcrowding, also to withdraw the application for legislation to compel the company to allow soldiers to ride free. Other matters of a very minor nature, of which some complaints had been made, are to be submitted to the city's advisory transportation commission for adjustment. The General Manager of the Toronto Ry. is reported to have stated that a bylaw was being prepared having for its object the reservation of a space on the rear platform of the cars for easy access to and exit from the cars, and to prevent overcrowding on the back platform. The General Manager also stated that for the first time in the company's history, it had been compelled to advertise for men. During the first 11 days of March, 67 employees enlisted. During February, 175 new men were engaged, but only 43 completed their course. Of the 50 additional cars ordered to be placed in service, by the Ontario Railway and Municipal Board, 25 were already running on the streets, and the material was in hand for the balance.

The City of Toronto is promoting a bill in the Ontario Legislature to compel the Toronto Ry. to build and operate 200 additional cars, and in default to pay to the city a penalty of \$500 a day after a lapse of three months from the passing of the Act. In an interview respecting the suggestion that the company be compelled to carry soldiers free on its cars, the Mayor is reported to have said, Mar. 23, that the city's bill containing such a provision was before the Legislature, and in addition the matter was to be taken up by the Advisory Transportation Commission recently appointed. As a matter of fact, the clause calling upon the company to carry soldiers free, was withdrawn from the bill following the conference between the Board of Control and the company's General Manager, as mentioned above.

The St. John River Hydro Electric Co. is asking the New Brunswick Legislature to revive and amend its act of incorporation authorizing the development of a water power on the St. John River at Pokiok, N.B., and to transmit electric power. R. W. McCarty is Secretary.

Electric Railway Projects, Construction, Betterments Etc.

British Columbia Electric Ry.—A New Westminster press report says track laying was started Mar. 10. on the spur track from the Fraser Valley Branch over the C.P.R. to the western end of the company's waterfrontage adjacent to the C.P.R. wharves. The work of removing the freight sheds from the present location to the outer edge of the harbor front, will, it is expected, be undertaken immediately. (Jan., pg. 30.)

Buffalo, Fort Erie Ferry & Rd. Co.—The Ontario Legislature is being asked to incorporate a company with this title, with F. V. E. Bardoe, A. Fasken, D. McArthur, J. O. Buckley and G. H. Sedgewick as provisional directors, with a capital of \$500,000, and office at Fort Erie, Ont., to take over the railway property of the Buffalo & Fort Erie Ferry & Ry. Co.'s assets. It is declared that the railway extends from the western boundary of the Garrison Reserve, in Bertie Township, to Fort Erie, and the company desires to have power to extend it from the present westerly terminus in Bertie Township to Port Colborne, and from its present terminus in Fort Erie via Bridgeburg to Chippewa, with a branch line to Crystal Beach; and from Fort Erie to any part of Point Albino. The company also desires power to erect wharves at any point where the railway touches navigable waters and to operate steam or other vessels to run between Ontario and the United States. With the consent of the municipalities, the company may lay tracks on streets and highways. It may operate its cars by steam, gasoline or electric power, and may issue bonds for \$10,000 a mile. (Feb., pg. 23.)

Edmonton Interurban Ry.—The agreement to lease the company's tracks from 124th St. and 118th Ave., to the G. T. Pacific Ry. tracks on 127th St., to the Edmonton Radial Ry., which is owned by the city, has been approved by the Edmonton, Alta., City Council. Under the agreement, the Edmonton Radial is to bond the rails and to erect all overhead work, to maintain the track, and at the termination of the agreement, to hand it over to the Edmonton Interurban in good condition. The line is to be put in operation within four months of the signing of the agreement, and the Edmonton Radial is to furnish monthly reports of the earnings and the cost of operation. The rental to be paid is to be the surplus of earnings over operating expenses, but the total for the year is not to exceed 8% of the initial cost of the line to the Edmonton Interurban. The latter must be notified within 60 days after any capital expenditure has been made, of its amount. The agreement is to run for one year from April 1, but may be terminated on three months notice on either side; and on giving similar notice, either company can purchase the rights and interest of the other in the line. (Feb., pg. 23.)

Halifax Electric Tramway Co.—Plans have been deposited with the Minister of Public Works, at Ottawa, showing site and location of a submarine electric cable under the harbor, at the foot of Hanover St., Halifax, N.S.

Hull Electric Co.—The Hull, Que., Board of Trade passed a resolution Mar. 10, asking the city council to grant the company's request to construct a Y on the Chelsea Road, to give a better service to Wrightville. (Mar., 1915, pg. 108.)

Lacombe & Blindman Valley Electric Ry.—The Alberta Government is being asked to press for the completion of this railway, the grading of which has been completed from Lacombe to Rimbey, 39 miles. (Jan., pg. 30.)

Lake Erie and Northern Ry.—We are officially advised that the connection with the Brantford and Hamilton Ry. in Brantford, Ont., and the building of a union station is under consideration, but no definite arrangements have been made. The distance between the lines of the two companies is approximately 2,000 ft.

London & Port Stanley Ry.—The Board of Railway Commissioners has authorized the building of a siding in London, to the Hunt Milling Co. and the City Gas Co.'s premises, and has given the L. & P.S. Ry. the right to use the G.T.R. station in London, where a platform is to be built, from Richmond to Clarence St., for its use. (Feb., pg. 73.)

Montreal & Southern Counties Ry.—We are officially advised that it is not expected that the recently completed extension from St. Cesaire to Abbotsford, Que., will be opened for traffic before May 1. (Jan., pg. 30.)

Mount McKay & Kakabeka Falls Ry.—The Ontario Legislature is being asked to authorize the company to use steam as an alternative motive power on its proposed railway, and to extend the time for the construction of the remaining portions of the line. The existing line has been operated by electricity, and the company desires to have power to use steam, if it is found expedient to do so. (Mar., pg. 115.)

Three Rivers Traction Co.—The Quebec Legislature has authorized the company to extend its line from Wayagamack into the parish of Cap de la Madeleine, notwithstanding the fact that the municipality declined to grant a franchise. The municipality granted a franchise after the company's application came before the Legislature. (Mar., pg. 115.)

Sudbury Copper Cliff Suburban Electric Ry.—The town council of Sudbury, is asking the Ontario Legislature to confirm and agreement dated Sept. 15, 1915, made under the terms of a bylaw, providing for the guarantee by the town of the company's bonds for \$75,000. A mortgage dated Jan. 10, 1916, of the company's railway has been made as security for the guarantee, the town council being made trustee. One of the conditions of the mortgage is that the town council may take possession of the line and operate it, and that in the event of its paying any money on account of principal and interest the town council is placed in the position of a bondholder; the town may also borrow to make good the guarantee, and in the event of foreclosure the town may acquire and purchase the company's property, subject to the ratepayers' approval.

St. John Ry.—The New Brunswick Legislature is being asked to extend the company's powers in respect of the building of extensions of line into Simonds Parish. (Feb. pg. 73.)

Toronto Suburban Ry.—The city of Toronto is asking the Ontario Legislature to pass a bill, which includes the following section relative to the T. S. R.: "All the rights and privileges of the Toronto Suburban Ry. to operate rail-

ways or to exercise any other franchise rights within that part of Ward 7 south of Dundas St., in the city of Toronto, are hereby declared to be forfeited and cancelled." The rights referred to cover the right to operate cars on the branch line running south of Dundas St., or to build lines on the streets in any other part of the municipality lying to the south of that line, and would leave the company, in the city, only its line on Dundas St., the line on the Weston road and that on Davenport road; these lines have their present termini in Lambton Park, at Woodbridge, and at the head of Bathurst St., respectively.

Vercheres, Chambly & La Prairie Tramways Co.—The provisional directors named in the act for the incorporation of a company with this title, passed by the Quebec Legislature, are J. W. Domville, Rosemere, Que.; A. Colas, Longueuil, Que.; D. W. Ogilvie, E. Pitt, and E. Ducharme, Montreal. The company is to have a capital of \$500,000 and office at Montreal. The route of the projected line is in the streets of Longueuil, St. Lambert, Montreal South, Greenfield Park, La Prairie; from Longueuil north-easterly through St. Antoine de Longueuil, Boucherville, Varennes, Vercheres, Contrecoeur and St. Riche, then easterly towards the northern shore of Richelieu River, through the parishes of St. Roch, St. Antoine de Richelieu, St. Theodoise, Ste. Marie, Beaulieu, Ste. Julie, St. Basile, Chambly, Chambly Basin, Chambly Canton, thence westerly across the parishes and villages of Chambly, St. Basile, and St. Robert to Longueuil, and from several points on the latter line to Montreal South, Greenfield Park, St. Lambert, La Prairie; from La Prairie southwesterly to Caughnawaga, to Chateaugay, with the right to cross the St. Lawrence River and enter the island and city of Montreal. Steam may be used on the lines during construction, but not as a permanent motive power. In passing through the Legislature amendments were introduced providing that while the company may enter the Island of Montreal, it shall not be allowed to operate on it, and that in the event of any municipality refusing consent to the operation of the company's lines within their territory, the company can appeal to the Public Utilities Commission. (Feb., pg. 73.)

Winnipeg Electric Ry.—The Winnipeg City Council is considering the desirability of asking the company to lay new lines paralleling Main St. and Portage Ave., and another line between McGregor and Main Sts., North Winnipeg.

The company is reported to be giving favorable consideration to the city's suggestion that the Marion St. car line be extended from its present terminus at the railway tracks to the stockyards.

Sault Ste Marie Electric Railway.—A Sault Ste Marie, Ont., press dispatch of Mar. 21, says that the Great Lakes Power Co., a newly organized corporation composed of United States people and represented by James Heyworth of Chicago, has bought the Algoma Steel Corporation's power plant at Sault Ste Marie and also the street railway system and the ferry running between Sault Ste Marie, Ont. and Sault Ste Marie, Mich. The International Transit Co. operates 4.32 miles of electric railway in Sault Ste Marie, Ont. and to Stelton, Ont. and also operates the International Ferry. The Trans-St. Mary's Traction Co. has 7.52 miles of electric railway in Sault Ste Marie, Mich. and connects that place with Algonquin, Mich.

Mainly About Electric Railway People.

J. W. Buchanan, heretofore Assistant Accountant, Winnipeg Electric Ry., has been appointed Accountant.

Lawrence Palk, Claims Agent, Winnipeg, Electric Ry., has also been appointed Assistant to the Manager.

J. E. Hutcheson, General Manager, Montreal Tramways Co., left Montreal Mar. 5 to have a few weeks rest and change in Florida.

William Norris, General Superintendent, Chatham, Wallaceburg & Lake Erie Ry., died in London, Ont., Mar. 6, from pneumonia after three weeks illness.

Thos. Ahearn, President, Ottawa Electric Ry., left Ottawa March 10 for Florida accompanied by R. Quain, another director, intending to return early in April.

Commissioner C. J. Yorath, of Saskatoon, Sask., gave an address on civic government at a Sunday afternoon gathering of the People's Forum there, Mar. 5.

C. S. Lockwood, Office Manager, Niagara, Welland & Lake Erie Ry., has been appointed acting Superintendent, in consequence of the death of F. J. Boyd, Superintendent.

A. Gaboury, Superintendent, Montreal Tramways Co., should have been mentioned in the "Birthdays of Transportation Men in April" on page 133 of this issue. He was born at Montreal April 6, 1875.

R. M. Paine, local dispatcher, British Columbia Electric Ry., Vancouver, was presented with a silver spirit flask, by the staff, Mar. 15, on leaving for Kingston, Ont., to join Queen's University Artillery.

Jas. Hilton was presented with a gold watch, by the motormen and conductors of the Vancouver city lines of the British Columbia Electric Ry., Mar. 16, on retiring from the position of Traffic Superintendent.

G. A. Henson, heretofore Chief Accountant, Winnipeg Electric Ry., has been appointed Assistant Treasurer, and is in charge of the accounting department of the general office under the Secretary-Treasurer, F. Morton Morse.

G. H. Rapsey, one of the Public Utilities Commissioners of Port Arthur, who operate the Port Arthur Civic Ry., is acting as Secretary, as V. Shipway, heretofore Secretary, has enlisted in the Canadian Expeditionary Forces.

W. J. Curle, heretofore Assistant Superintendent, Toronto District, Ontario Division, Canadian Northern Ry., Toronto, has been appointed General Superintendent, Chatham, Wallaceburg & Lake Erie Ry., vice W. Norris, deceased. Office, Chatham, Ont.

R. J. Clark, who resigned as Assistant Comptroller, Toronto Ry., in 1910, on his appointment as Comptroller, Kansas City Ry. & Light Co., Kansas City, Mo., has been appointed Secretary and Treasurer of the reorganized company, his former title having been abolished.

Duncan McDonald, ex-General Manager, Montreal Tramways Co., who was a member of the Montreal Board of Control, during the last financial year, is a candidate for the mayoralty for 1916-17, and is making the Montreal Tramways Co's franchise an issue.

U. H. Holmes, formerly a conductor on the Saskatoon, Sask., Municipal Ry., has been appointed to the command of the 13th C.M.R., Kingston, Ont. He entered

the Canadian Militia in 1883, and was placed on the reserve list of officers in 1910, with the rank of Lieut.-Colonel.

G. J. Meyer, heretofore Chief Engineer, Montreal & Southern Counties Ry., has been appointed Chief Engineer and General Superintendent. Office, St. Lambert, Que. **W. O. LeBer**, heretofore acting Superintendent of Transportation, Montreal, has been appointed Trainmaster at St. Lambert.

F. S. Woodcock, heretofore Traffic Manager, Saskatoon Municipal Ry., having left for active military service, the position has been abolished and J. P. McKenzie, formerly Master Mechanic, has been appointed Assistant Superintendent, a new position. The Superintendent is G. D. Archibald, who is also City Engineer. **L. V. Clare** has been appointed Secretary.



G. W. Lang
Claims Agent, Ottawa Electric Railway.

M. M. Inglis, has been appointed Manager of the Port Arthur, Ont. Civic Ry., succeeding M. O. Robinson. It is said that he will be given the management of the other public utilities of the city by the Public Utilities Commission at an early date. He was born in Scotland, came to Canada in 1911, and acted as Electrical Engineer for the town of Yorkton, Sask. until the end of 1915.

Lt.-Col. A. T. Thompson, of Ottawa, who has been on the reserve of officers for the last few years, his late corps being the 5th Infantry Brigade, and who is ex M.P. for Haldimand, Ont., and is the British Columbia Electric Ry.'s Ottawa solicitor, has been appointed to the command of the 114th Battalion (Haldimand County and Six Nations Indian Reserve) Canadian Expeditionary Force.

Richard Dawson, who was appointed night superintendent, Detroit United Ry., Detroit, Mich., recently, was born in Seaford, Ont., Dec. 9, 1880. He became connected with the D.U.R. in 1898 as an employe in the Warren Ave. car house. He

went on the line as a conductor shortly after and remained in that capacity for seven years. He was then appointed car house foreman of the Warren Ave. car house and served five years. Subsequently he was appointed Assistant Division Superintendent.

W. W. Chisholm, Electrical Engineer, Windsor, Essex & Lake Shore Rapid Ry., was accidentally electrocuted, Mar. 23, while coupling some cars in the Kingsville yard. He was born at Caradoc, Ont., Oct. 17, 1876, and entered railway service in June, 1896, since when he was, to Apr., 1897, switchman, Michigan Central Rd., St. Thomas, Ont.; Apr. 1897 to Mar. 1898, yard conductor and Assistant Yardmaster, Toronto, Hamilton & Buffalo Ry., Hamilton, Ont.; Mar. 1898 to June 1903, brakeman, Michigan Central Rd., St. Thomas, Ont.; May 1905 to Nov. 1907, Assistant Chief Engineer, City Pumping Station, St. Thomas, Ont.; Nov. 1907 to Jan. 1, 1915, Chief Engineer, Windsor, Essex & Lake Shore Rapid Ry., Kingsville, Ont., on which latter date he was appointed Electrical Engineer of the company, following a change of staff consequent on the accidental death of A. W. Westman, Superintendent, under somewhat similar circumstances at Kingsville in Dec. 1914.

Electric Railway Finance, Meetings, Etc.

Brantford Municipal Ry.—Total earnings from Jan. 1 to Feb. 28, \$6,169.41 against \$5,640.70 for same period 1915.

British Columbia Electric Ry.—The traffic returns for the Vancouver city and suburban lines for February, show increases over those for Feb. 1915. The percentage paid to the city in respect of the city lines, for February, was \$1,654.20 against \$1,414.50.

Cape Breton Electric Co.—

Gross earnings	\$34,120.37	\$28,051.06
Operating expenses	19,189.56	17,782.38
Net earnings	14,930.81	11,271.68

Nippissing Central Ry.—The Treasurer of Ontario informed the Legislature recently, that the net amount of the railway for the last financial year was \$25,000.

Saskatoon Municipal Ry.—Total revenue for Jan., \$16,468.62; operating expenses \$11,648.08; net operating revenue \$4,820.54; capital charges \$4,575; net profit \$245.54; total miles run 59,162; passengers carried 321,539; receipts per car mile 27.836c.; operating expenses per car mile 19.688c.; capital charges per car mile 7.733c.; total kilowatt hours 188,370; kilowatt hours per car mile 3.182; passengers per car mile 5.434.

Saskatoon Municipal Ry.—Net earnings for February, \$1,300, against a deficit of \$4,839 for Feb. 1915. Net operating result for two months ended Feb. 29, \$1,545, against a deficit of \$9,523 for same period in 1915.

Toronto Ry.—

	1916	City percentage	1915	City percentage
Jan.	\$17,784	868.847	\$17,126	778.186
Feb.	470,764	70.614	440,313	66.047
	\$944,548	\$1,299.461	\$911,439	\$1,100

Toronto Civic Ry.—The cost of operating in 1915 was \$214,969 and for this year it is estimated at \$241,270. The receipts for this year are estimated at \$200,000. The Works Commissioner has asked for \$55,682 for the operation of the portions of the Toronto & York Radial Ry.'s Mimico and Scarborough divisions which have passed into the city's hands.

Marine Department

Coast, Lake and River Steamship Officers for 1916.

The following appointments, made by navigation companies, engaged in Canadian navigation, for their various steamships and tugs, have been reported to Canadian Railway and Marine World. The first column gives the names of the vessels, the second, those of the captains, and the third, those of the chief engineers.

ALGOMA CENTRAL STEAMSHIP LINE, SAULT STE.

Agawa	MARIE, ONT.	
J. Frater Taylor	J. A. Brown	J. L. Smith
Thos. J. Drummond	R. H. Boyle	L. B. Cronk
W. C. Franz	A. McIntyre	W. T. Rennie
	W. C. Jordan	G. Sylvester
BATHURST LUMBER CO., LTD., BATHURST, N.B.		
Betty D.	A. Hains	G. Howland
Nipisiguit	A. Martin	L. Spragg
BOWRING BROS., LTD., ST. JOHN'S, Nfld.		
Eagle	E. Bishop	A. McKinlay
Florizel	W. J. Martin	J. V. Reader
Portia	J. W. Kean	A. Smith
Prospero	A. Kean	J. McKinlay
Ranger	W. Bartlett, Jr.	F. Mahers
Stephano	C. Smith	J. M. Fernandez
Terra Nova	S. R. Winsor	A. F. Osmond
Viking	W. Bartlett	C. Lewis

CANADA ATLANTIC AND PLANT LINE STEAMSHIP CO., HALIFAX, N.S.

Evangeline	F. H. Hawes	Jas. Smith
Halifax	H. Doyle	R. Mackay
CANADA ATLANTIC TRANSIT CO. LTD., MONTREAL.		
Arthur Orr	John Simons	D. E. Mance
Geo. N. Orr	H. Jaenke	J. B. Wellman
Kearsarge	W. Baxter	A. P. Williams

CANADA STEAMSHIP LINES LTD., MONTREAL

A. E. Ames	W. H. Montgomery	G. Jarrell
A. E. McKinstry	C. Robertson	A. Langlois
Acadian	C. C. Hunter	G. Stephen
Aletha	James Crawford	
America	R. H. Carnegie	James Gillie
Beaverton	W. Bryan	H. Myler
Belleville	W. Bloomfield	John Kennedy
Bickerdike	T. S. Patterson	S. LaRue
Boucherville	A. Lavolette	C. Hamel
Brockville	D. B. Christie	
C. A. Jaques	B. P. Powell	G. Belanger
Cadillac	H. S. Beauvais	A. S. Hawkins
Calgarian	R. Pyette	A. Black
Canadian	J. Mitchell	C. M. Metcalf
Cascapedia	John Hearn	John Koening
Cayuga	C. J. Smith	J. Mains
Chippewa	W. Malcom	H. Parker
City of Hamilton	O. Patenaude	W. Dungan
City of Ottawa	J. L. Baxter	C. Holmes
Corona	B. A. Bongard	J. Kennedy
D. A. Gordon	J. Ritcey	G. W. Crossan
Doric	R. McIntyre	Jos. Aston
Dundee	R. N. Anderson	E. Shaw
Emperor	G. W. Pearson	G. Smith
Empress of Midland	W. D. Shepperd	W. Byers
Fairfax	M. Heffernan	C. LaVallee
Fordonian	J. E. Mann	Jas. Kettles
Glenellah	D. MacKinnon	E. C. Watson
H. M. Pellatt	O. W. Patterson	W. Harman
Haddington	R. J. Wilson	C. LeRiche
Hamiltonian	A. B. McIntyre	A. E. Kennedy
Ionic	C. M. Wing	A. E. Crosswaitte
J. H. Plummer	N. McKay	A. McCauley
Kenora	S. H. Cook	Jas. Kelly
Kingston	E. A. Booth	W. Chipman
Laurentian	Jos. Boucher	E. Cantin
Longueuil		H. Noel
Louis Phillippe	H. Mandeville	A. Chayer
Macassa	J. Henderson	E. A. Prince
Mapleton	R. A. McLellan	A. E. House
Martian	J. F. Davis	R. Foote
Midland King	P. McKay	Jas. McGregor
Midland Prince	Jas. Tyndall	J. A. Pickard
Modjeska	P. Walsh	A. McLaren
Montreal	F. X. LaFrance	N. Beaudoin
Murray Bay	Jos. Latour	A. Charbonneau
Natironco	W. Beatty	G. McDonald
Neepawah	J. Aikman	W. Donahy
New Island Wanderer	W. C. Hudson	
Quebec	Jos. Rinfret	J. Matte
Ramona	E. M. Charlebois	
Rapids Prince	S. Putnam	G. M. Hazlett
Rapids Queen	J. P. Stephenson	J. E. Kane
Renvoyle	J. Harrison	
Rosedale	H. J. Aitkens	G. H. Dryburgh
Ste. Irene	W. Gagne	O. Bonin
St. Lawrence	John Bertrand	B. F. Farrell
Saguenay	Jos. Simard	A. Godin
Sarnian	D. W. Burke	I. J. Boynton
Saskatoon	N. McGlennon	J. McKellar
Stadacona	H. J. Page	W. W. Norcross
Strathcona	J. Clarke	J. Douglas
Syracuse		A. F. Hamelin
Tadousac	Jos. Dugal	G. Gagnon
Tagona	C. Snowden	W. Taylor
Thousand Islander	C. H. Kendall	W. H. Willix
Three Rivers	A. Mondor	C. Gendron
Toronto	J. J. Jarrell	L. J. Lealie

Turbinia	B. W. Bongard	W. Noonan
W. G. Morden	N. Campbell	R. Chalmers
Wahcondah	Jas. Woolner	W. A. McLaren
Wiley M. Egan	N. Hudgins	
Winona	C. O. Allen	J. J. Palmer

C.P.R. BRITISH COLUMBIA LAKE AND RIVER SERVICE, NELSON, B.C.

Hosmer	F. L. Orr	N. Hawthorn
Kokanee	L. McKinnon	J. G. Cameron
Minto	A. Forslund	J. Fyfe
Naramata	J. B. Weeks	J. P. Sutherland
Nasookin	W. Seaman	D. H. Biggam
Sandon	W. Wright	W. Edwards
Sicamous	G. Robertson	D. Stephens
Slocan	W. Kirby	D. McLeod
Valhalla	W. Ferguson	T. C. I Anson
Whitshan	J. Fitzsimmons	F. Matheson

C.P.R. DETROIT RIVER CAR FERRIES, WINDSOR, ONT.

Ontario	R. Brown	C. A. Sullivan
C.P.R. GREAT LAKES STEAMSHIP SERVICE, PORT MCNICOLL, ONT.		
Alberta	F. J. Davis	C. Butterworth
Assiniboia	J. M. Cannel	A. Cameron
Athabasca	M. McKay	G. D. Adam
Keewatin	M. McPhee	W. Lewis
Manitoba	J. McIntyre	R. Sinclair

CANADIAN NORTHWEST STEAMSHIP CO. LTD., TORONTO

Atikokan	W. J. Brown	J. H. Loudon
George A. Graham	J. A. Ewart	H. C. Harrison
Paipoung	P. McIntyre	H. H. Moore
Thunder Bay	H. Finn	

CANADIAN PACIFIC CAR AND PASSENGER TRANSFER CO., PRESCOTT, ONT.

Charles Lyon	W. Henry	L. Black
--------------	----------	----------

CANADIAN TOWING AND WRECKING CO. LTD., PORT ARTHUR, ONT.

Bowman	H. Gehl	A. Debernardi
James Whalen	A. Morrison	H. Cross
Salvor	W. Nuttall	A. Vigars
Sarnia	A. E. Fader	E. L. Williams
Superior	A. E. Watson	J. Farquharson

HUGH CANN AND SONS LTD., YARMOUTH, N.S.

Bruce Cann	I. A. Banks	H. Goodwin
Hugh D.	E. B. McKerson	A. Wise
John L. Cann	A. L. McKinnon	John Nixon
La Tour	F. E. Smith	C. R. Weddleton
Malcolm Cann	J. R. Durkee	D. E. Read
Mary H. Cann	F. L. McKerson	W. Amervo
Percy Cann (spare)	J. A. Banks	H. Goodwin
Robert G. Cann	W. E. Morris	H. C. Doune
Wanda	B. C. Newell	A. Rogers

CAPE BRETON ELECTRIC CO. LTD., SYDNEY, N.S.

Electronic	I. H. Lewis	B. Dixon
Hygeia	J. Brown	A. Tulke
Peerless	A. McLeod	J. B. Weeks

CENTRAL CANADA COAL CO. LTD., BROCKVILLE, ONT.

Samuel Marshall	W. A. Tullock	J. R. Ferguson
-----------------	---------------	----------------

CHICAGO, DULUTH AND GEORGIAN BAY TRANSIT CO., CHICAGO, ILL.

North American	G. M. Cummings	J. F. Buritz
South American	C. M. Haight	C. H. Menmuir

COAST COLUMBIA CO. LTD., VANCOUVER, B.C.

British Columbia	G. Foellmer	J. Ellison
Celtic	J. Finlay	H. Buxton
Clansman	M. F. MacDonald	H. Nissen
Fingal	R. W. H. Lloyd	H. Spencer

DARTMOUTH FERRY COMMISSION, DARTMOUTH, N.S.

Chebucto	J. Hare	W. Case
Dartmouth	W. Jennex	A. McLeod
Halifax	C. Ozon	S. Stevenson
	N. Allen	

DEER ISLAND AND CAMPOBELLO STEAMBOAT CO. LTD., ST. STEPHEN, N.B.

Viking	F. Johnson	F. H. Rowe
--------	------------	------------

FARRAR TRANSPORTATION CO. LTD., TORONTO.

Collingwood	John Ewart	D. McLeod
Meaford		T. W. Verity

GASPE AND BAIE DES CHALEURS STEAMSHIP CO. LTD., QUEBEC, QUE.

Gaspeian	Jos. Vezina	N. Protomastro
Percesien	L. D. Morin	Jos. Ruel

GLOUCESTER NAVIGATION CO. LTD., CARAQUET, N.B.

Beaver	F. Hache	E. H. Haviland
--------	----------	----------------

GRAND MANAN STEAMSHIP CO. LTD., GRAND MANAN, N.B.

Grand Manan	N. S. MacKinnon	J. F. McGray
-------------	-----------------	--------------

GRAND TRUNK PACIFIC STEAMSHIP CO. LTD., VANCOUVER, B.C.

Prince Albert	W. S. Morehouse	R. Bell
Prince George	D. Donald	I. O. Handy
Prince John	C. W. Wearmouth	A. S. Munro
Prince Rupert	D. Mackenzie	D. G. Ferrier

GRAND TRUNK RY. DETROIT RIVER CAR FERRIES, WINDSOR, ONT.

Great Western	M. Bausette	Jos. Ladds
Huron	O. Lalonde	A. Cook
Lansdowne	John Jackson	W. Belsom

GRAND TRUNK AND WABASH RY. DETROIT RIVER CAR FERRIES, WINDSOR, ONT.

Detroit	R. Aikin	H. Lawry
Transfer	G. Honner	W. Taylor
Transport	W. Norvell	F. Robinson

GREAT LAKES DREDGING CO. LTD., PORT ARTHUR, ONT.

A. F. Bowman	H. Gehl	B. Debehardi
E. C. Whalen	J. Friday	C. Saunders
Edward Fiske	J. McGinnis	J. Bennett
J. D. Morrison	N. McLeod	N. Taylor
P. Gorman	T. Strong	D. Moore
Thos. Fisher	H. Friday	T. McHugh

GREAT LAKES TRANSPORTATION CO. LTD., MIDLAND, ONT.

Calgary	W. E. Linton	R. G. Walker
Glenfinnan	J. H. Crocker	C. McWilliams
Glenfoyle	F. Burke	J. P. Davidson
Glenlivet	A. Hudson	G. Price
Glenlyon		D. A. Sinclair
Glenmains		F. H. Brickenden
Glenshee	W. Levisne	F. Goodwin
Major	S. Carson	P. Eagles
Toiler	F. A. McMann	E. Scott

F. E. HALL AND CO., MONTREAL

Byron Whitaker	R. McLeod	F. Patterson
Compton	B. Bowen	L. Smith
Robert R. Rhodes	W. H. Ransom	F. A. Collier
Stanstead	E. Groulx	M. J. McFaul

HALL AND ELIGH LTD., OTTAWA, ONT.

Roberval	P. Eligh	P. Trotter
----------	----------	------------

GEO. HALL COAL CO. OF CANADA LTD., OGDENSBURG, N.Y.

A. D. MacTier	S. V. Anderson	Jas. Estes
Adrien Iselin	D. Hourigan	E. A. Barker
F. P. Jones	H. M. Russell	W. Thomson
Fred Mercur	S. J. LeBeau	B. J. Manwaring
Geo. L. Eaton	W. A. Russell	W. J. Brown
John Rugee	H. Russell	J. W. Cline
L. W. Robinson	J. J. Powers	R. Jardin
Phenix	D. A. Kiah	E. A. Hyatt

IMPERIAL OIL CO. LTD., SARNIA, ONT.

Imperial	H. C. Minnett	G. E. Down
Imperial	J. Wilkie	J. Smith
Iocelite		A. R. Fleming
Iocoma	G. T. Cross	C. Amburg
Royalite	N. McL. Scott	A. M. Davidson
Samalite	G. Finley	E. Condon

INSULAR STEAMSHIP CO. LTD., WESTPORT, N.S.

Westport III	St. Clair Cann	Jas. Strickland
--------------	----------------	-----------------

INTERNATIONAL TRANSIT CO., SAULT STE. MARIE, ONT.

Algoma	F. Frech	C. Innes
--------	----------	----------

ISLAND TUG CO. LTD., CHARLOTTETOWN, P.E.I.

Fred M. Batt	W. M. Snow	G. H. Beers
Harland	J. T. McLaine	A. Roebuck
Islander	John McIsaac	W. A. McEachern

KEENAN TOWING CO. LTD., OWEN SOUND, ONT.

Keenan	J. Rutherford	W. Owens
--------	---------------	----------

KEYSTONE TRANSPORTATION CO. LTD., MONTREAL

Keybell	L. Beaufre	E. W. Sparling
Keynor	J. Martin	J. Robertson
Keyport	J. Mullen	R. J. Muchmore
Keyvive	G. Bunting	Jas. Boak
Keywest	A. Barrett	W. H. Jennison

LA HAVE STEAMSHIP CO. LTD., WEST LA HAVE, N.S.

Trusty	J. Crouse	A. Zwicker
--------	-----------	------------

LAKE ERIE NAVIGATION CO., WALKERVILLE, ONT.

Marquette and Bessemer No. 1	J. A. Patterson	H. Culp
------------------------------	-----------------	---------

LAKE SIMCOE NAVIGATION CO. LTD., TORONTO.

Modello	L. Johnston	
Otonabee	W. Williams	T. A. Cooley

THE LEVIS MARITIME AND INDUSTRIAL CO. LTD., LEVIS, QUE.

Champion	D. Leamy	C. Barras
Frontenac	Jos. Plante	P. Plante

MAGNETAWAN RIVER AND LAKE STEAMBOAT CO. LTD., BURKS FALLS, ONT.

Armour	J. Mortimer	R. Dunn
Glenada	W. Kennedy	J. Kennedy
Gravenhurst	S. Creswell	M. Pritchard
Wanita	W. Keetch	C. Rasplant

MARITIME STEAMSHIP CO. LTD., BLACKS HARBOR, N.B.

Connors Bros.	E. H. Warnock	G. Cowie
---------------	---------------	----------

MARQUETTE AND BESSEMER DOCK AND NAVIGATION CO., WALKERVILLE, ONT.

Marquette and Bessemer No. 2	John Vanbuskirk	T. Elliott
------------------------------	-----------------	------------

MATHEWS STEAMSHIP CO. LTD., TORONTO.

Easton	D. N. Laroche	J. T. Myler
Edmonton	C. R. Albinson	F. A. Pringle
Malton	W. J. Moles	G. H. Finn
Masaba	J. A. Smith	W. Whipp
Riverton	H. Maitland	J. G. Fisher
Steelton	W. J. Kirkwood	J. A. McGill
Yorkton	R. Alexander	D. McKenzie

MIDLAND TRANSPORTATION CO. LTD., MIDLAND, ONT.

C. W. Chamberlain	B. W. Morgan	W. Malcom
Onaping	A. Cuff	G. Lamb

MONTREAL AND CORNWALL NAVIGATION CO. LTD.,
CORNWALL, ONT.
Britannic A. Anderson N. Marchand
NIAGARA ST. CATHARINES AND TORONTO NAVI-
GATION CO. LTD., ST. CATHARINES, ONT.
Dalhousie City J. W. Maddick J. H. Brown
Garden City G. Blanchard H. R. Welch
NORTH VANCOUVER FERRY CO. LTD., NORTH
VANCOUVER, B.C.

North Vancouver No. 1 W. Fatke I. N. Kendall
North Vancouver No. 2 R. R. Spicer D. Becker
North Vancouver No. 3 W. J. Sprackton J. W. Whitworth

NORTHERN NAVIGATION CO. LTD., SARNIA, ONT.
City of Midland E. Walkinshaw J. Osburn
Germanic F. G. Moles S. Burgess
Hamonic A. L. Campbell John Smith
Huronic A. M. Wright J. McLeod
Nuronic R. D. Foote S. Brisbin
Rochester J. D. Montgomery A. W. White
Saronic G. W. Kinnee S. Beatty
Waubic

ONTARIO CAR FERRY CO. LTD., MONTREAL
Ontario No. 1 S. McCoig D. L. Smyth
Ontario No. 2 F. D. Forrest J. A. Nicoll

OTTAWA RIVER NAVIGATION CO. LTD., MONTREAL
Duchess of York E. Piche
Empress A. Blondin A. L. deMartigny

OTTAWA TRANSPORTATION CO. LTD., OTTAWA,
ONT.

Dolphin Z. Lavigne N. Lavigne
Florence E. Lefebvre A. Madore
Glen Allan A. Clark John Drury
Hall J. C. Barclay D. Moranville
Ottawa A. Mallette V. Lavigne
Scotsman E. Francoeur James Schryer
Sir Hector W. Mainville

PEMBROKE TRANSPORTATION CO. LTD., PEMBROKE,
ONT.

Oiseau Jos. Tessier J. Trottier

PENINSULA TUG AND TOWING CO. LTD.,
WARTON, ONT.

Crawford W. M. Tyson R. H. Isbester
Homer Warren F. Wood W. C. Fox

PENNSYLVANIA-ONTARIO TRANSPORTATION CO.,
CLEVELAND, OHIO.

Ashtabula C. F. Meyers S. M. Sylvester

PORT COLBORNE TUG CO. LTD., PORT COLBORNE,
ONT.

J. V. O'Brien D. McGrath W. Bush
Meteor John McGrath W. Taylor

PORT HURON AND SARNIA FERRY CO., PORT
HURON, MICH.

Hiawatha E. M. Thomas H. Myers
James Beard G. Waugh W. Winterhalter
Linden W. J. Cowles E. Wenner
O. D. Conger W. S. Major R. Cameron
Pawnee Jas. Cassin F. Cadotte

PRESCOTT AND OGDENSBURG FERRY CO., PRESCOTT
ONT.

Miss Vandenburg H. Black W. J. Jenks
S. J. Delancy

QUEBEC TRANSPORTATION AND FORWARDING CO.
LTD., QUEBEC, QUE.

Florence V. Gendron S. Legendre
J. H. Hackett Jos. Thibault A. Legendre
Margaret A. Hackett M. Allison O. Croteau

REID WRECKING CO., SARNIA, ONT.

J. M. Diver W. Glass G. Green
James Reid F. Sennett J. W. Roberts
Manistique W. C. Sparling R. Campbell
S. M. Fischer A. J. Bonuah D. Reed
Sarnia City G. Hindman Jas. Hopwood
Spokane A. Cascadin

ROYAL MAIL STEAM PACKET CO. LTD., HALIFAX,
N.S.

Carquet W. H. Lainson W. Hobson
Chaleur T. A. Hill J. Bassett
Chaudiere F. Willan A. L. Bennee
Chignecto C. Adam G. H. Madge

ST. LAWRENCE AND CHICAGO STEAM NAVIGATION
CO. LTD., TORONTO.

E. B. Osler C. E. Robinson W. Robertson
Iroquois J. H. Hudson J. E. Readman
J. H. G. Hagarty S. Hill C. Robertson
W. D. Matthews W. Cunningham W. Harwood

J. F. SOWARDS, KINGSTON, ONT.

H. N. Jex M. M. Shaw W. McCabe
Shanly J. F. Sowards John Maloney

SPARROW LAKE STEAMER LINE, SPARROW LAKE,
ONT.

Glympse A. F. Stanton G. T. Stanton
Lakeland F. Stanton W. Tracey

STEAMER PREMIER, SAULT STE. MARIE, ONT.

Premier W. Hyland John Bilmore

TERMINAL STEAM NAVIGATION CO. LTD., VAN-
COUVER, B.C.

Ballena J. A. Cates A. Pirie
Bowena F. W. Gilbert W. E. Brown
Britannia J. W. Cates A. Coole

CITY OF THREE RIVERS, QUE.

Le Progres N. W. Lewis A. Frenette

UNION STEAMSHIP CO. OF BRITISH COLUMBIA
LTD., VANCOUVER, B.C.

Camosun A. E. Dickson A. Beattie
Cassiar G. Gaisford P. J. V. Farina
Cheakamus J. Cockle J. F. Wilson
Chelohsin J. F. Edwards G. H. Foster
Comox J. Brown A. T. Roy
Coquitlam N. Gray J. Hogan
Cowichan C. Moody L. P. Thomas
Venture J. Park C. Arthur

UNITED STATES AND DOMINION TRANSPORTATION
CO., CHICAGO, ILL.

America E. C. Smith F. McMillan
Easton G. Exe

VALLEY CAMP COAL CO., MIDLAND, ONT.

Marida H. L. Jones J. O. Connor
Stewart J. P. McCarthy W. C. Houston
William S. Mack W. Ferguson W. J. McSweeney

VALLEY STEAMSHIP CO. LTD., ANNAPOLIS ROYAL,
N.S.

Granville C. W. Collins James McCollough

VANCOUVER TUG AND BARGE CO. LTD., VAN-
COUVER, B.C.

Clayburn H. Jones A. McGuire
Dola W. J. Verge W. McGuire

VICTORIA NAVIGATION CO. LTD., THURSO, QUE.

Victoria F. Elliott P. Belanger

WESTERIAN TRANSPORTATION CO. LTD., OTTAWA,
ONT.

Westerian A. Lefebvre M. Marchand

WINDSOR AND PEELE ISLAND STEAMSHIP CO.
LTD., PEELE ISLAND, ONT.

Peele J. N. Sheats

Shipping Companies and Longshoremen at St. John.

The decision of the conciliation board appointed to deal with the dispute between the shipping companies and the longshoremen at St. John, N.B., has already been given in Canadian Railway and Marine World. The details of the agreement made cover the following main points: Ten hours shall constitute a day's work, or a night's work, from Nov. 15 to Apr. 20 inclusive, and nine hours from May 1 to Nov. 15. The same men are not to be ordered back to work either day or night when other men are available, except when a vessel is within reasonable time of finishing, or shifting from berth to berth. If any gang be required to work through any meal hour, double time at the prevailing rate to be paid for such meal hour and for such time thereafter until relieved. Prevailing rate of wages to be paid for rigging and unrigging gear, hauling, staging and handling hatches, etc. Half the prevailing rate to be paid for men waiting when ordered out at 7 p.m. until 12 p.m., and when men are ordered out again at 1 a.m., full rate must be paid from that time until regular knocking off time in the morning, or when ordered out to work during meal hours. Double the prevailing rate to be paid for work on Sundays, Dominion Day, New Year Day, Good Friday and Christmas Day, and should any of these holidays fall on a Sunday and the following day be declared a holiday, such Monday shall be considered a holiday for which double the rate shall be paid. No work is to be performed on Labor Day. For handling sulphur or salt in bulk, 5c. an hour extra, Sundays and holidays pro rata.

Any vessel taking nothing but deals after discharge of cargo shall be termed a deal boat, and any taking a general cargo and deals shall be termed a cargo boat. A gang for loading and discharging a cargo boat is to consist of 15 men, except in case of bulk coal, salt, sulphur or maize, over side into scows or cars when 13 shall constitute a gang, the other two men to be employed otherwise, and in the case of deal boats, a gang shall not be less than 10 men. No man shall stay in the hold of a vessel when grain is running. All orders to men shall be issued through their respective foremen. All freight when trucked outside between sheds must have two men to truck. The rate of wages shall be 35c. an hour by day or night during the winter, and 40c. an hour during the summer; 12½c. an hour extra to be paid for handling bulk grain on weekdays, 25c. an hour extra on Sundays and holidays, until Apr. 30, 1917 inclusive, and thereafter the rate of wages shall be 40c. an hour day or night, summer or winter, and 50c. an hour for handling bulk grain on weekdays, and \$1 an hour for Sundays and holidays. Should work on any vessel begin during the summer or winter months, and continue into the winter or summer months, the schedule of wages for such vessel shall continue the same

until completion, as at the beginning of the work. The agreement is to continue in force until Dec. 1, 1919, and thereafter from year to year unless either party serve notice to the other at least 30 days prior to Dec. 1 in any year.

The board also recommended that the shipping companies enter into an agreement with the Longshoremen's Association, to give preference in employment to members of that association when available; and that a permanent local board be appointed to deal with any matters which may arise for settlement under this agreement. Further protective measures during loading and unloading at St. John, and the provision of suitable shelters at the sheds at West St. John, were also recommended. The board consisted of W. E. Foster, President and General Manager, St. Martins Ry., St. John, Chairman; J. Herbert Lauer, General Manager, Marconi Wireless Telegraph Co. of Canada, Montreal, representing the shipowners, and J. E. Tighe, St. John, on behalf of the men.

The schedule of working conditions for the handling of cargo at the port of St. John, covered by the agreement, is as follows: Pine and spruce deals per sling, 14 pieces 3 in.; 16 pieces 2 in., and where spruce and pine scantlings or deals shall be slung together, not less than the equivalent of 14 of 3 in. deals. Pine and spruce 1 in. 31 pieces per sling, pine and spruce scantling, 20 pieces per sling, and pine and spruce deal ends, 30 pieces per sling. Sawn birch per sling, 8 pieces 4 in.; 10 pieces 3 in.; 15 pieces 2 in.; 20 pieces 1 in.; laths, 20 bundles per sling. Not less than 12 men in a gang. Flour, 140 lb. sacks, 10 per sling, 5 per truck; 280 lb. sacks, 5 per sling, 2 per truck; 98 lb. bags, 15 per sling, 5 per truck. Pig iron, large, 10 pieces per sling, 10 pieces per truck; small, 15 pieces per sling and per truck. Salt in sacks, 5 sacks per sling and per truck; when stacked in shed or when stacked outside of shed, 2 men per truck; when discharged and stowed into decked vessels, 7 bags per sling, and when discharged into open scows, 9 sacks per sling, and not less than 6 men in steamer hold to sling same. Oil cake, 6 bags per sling and per truck; in bales, 6 bales per sling and 2 per truck. Axles, large, 1 per sling and per truck; small, 2 per sling and per truck. Car rims, one shall constitute a sling, large or small. Apples in barrels, 6 per sling, 3 per truck. Potatoes in barrels, 5 per sling, 3 per truck. Sugar, large, 5 bags per sling; small, 15 bags per sling. Hay, 6 bales per sling.

The Dominion Government s.s. Hoche-laga, which was purchased by the Government July 31, 1915, cost \$70,000 and \$22,642.18 additional was spent on overhauling and fitting out. She was in service during the autumn of 1915, and not being required during the winter, was laid up at Halifax, N.S., Dec. 20.

Canada Steamship Lines, Ltd. Annual Report and Meeting.

Following are extracts from the report for the calendar year 1915, presented at the annual meeting in Montreal, Mar. 15:

Your directors are pleased to be able to record a substantial improvement in the company's affairs owing partly to the higher freight rates, partly to their ventures on the Atlantic Ocean, and partly to the vigorous application of economy throughout the system by the management. The scarcity of tonnage all over the world caused by the war, the bountiful crops of Canada, and the return to more prosperous conditions by our industries, are the principal factors in expanding the operations of your fleet. Your directors wish to point out that the improved conditions referred to only began to show tangible results in the closing months of 1915, the spring and summer business having been below normal. As far as the future is concerned, your directors are of the opinion that the outlook for 1916 is promising and warrants the fullest confidence in the success of your undertaking.

You will be asked to approve appropriations covering directors' fee, the payment in part of salaries of employees who have enlisted for active service at the front, and also contributions to the patriotic and other funds occasioned by the war.

Several losses have occurred during the year to the fleet as a result of the dangers of navigation and the King's enemies, all of which, however, were covered by insurance. We regret, however, the loss of the crews who went down with the tug Frank C. Barnes on Lake Ontario, and the steamer Dunelm on the Atlantic. We can replace our steamships but these good men are gone forever. Your directors may state that in order to maintain the earning power of the company they are negotiating for replacement of some of the vessels lost.

Your vessels, docks, and other properties have all been well maintained and in many cases materially improved by additions and betterments.

As a result of the improved condition of affairs, your directors have decided to pay on May 1, part of the cumulative dividend due on the preference shares, viz., 1¼%. This payment will be made to shareholders of record at the close of business April 1.

OPERATING ACCOUNT.

Operating Revenue:	
Vessels	\$7,399,818.66
Docks and wharves	165,707.20
Miscellaneous	114,884.04
	\$7,680,409.90
Other revenue	94,624.58
Total revenue	\$7,775,034.48
Expenses	6,042,977.08
Net earnings	\$1,732,057.40
Interest on mortgage bonds	\$140,201.54
Interest on debenture stock	317,583.30
Other interest	85,276.39
Reserve for depreciation	476,937.91
Reserved for doubtful debts, claims, etc.	35,000.00
Directors' fees	14,906.66
	1,069,905.80
Profit for year	\$ 662,151.60

SURPLUS ACCOUNT.

Profit for year	\$ 662,151.60
Loss on sales, etc., of fixed assets	3,971.44
Proportion of following charged off:	
Organization expenses ..	\$65,835.64
Discount on	

debt stock	1,028.34	66,863.98	70,835.42
			\$ 591,316.18
Deficit Dec. 31, 1914			570,432.59
Surplus			\$ 20,883.59

Jas. Carruthers, President, in moving the adoption of the report at the annual meeting, said: "When we met here this time last year I do not think the most optimistic would have expected an increase in net earnings of about \$800,000 over the previous year. Your directors certainly did not, yet in the report now before you the net earnings are shown as over \$1,700,000. The management entered a field of operations quite foreign to anything heretofore attempted by the company or any of its subsidiaries, viz.: the Trans-Atlantic trade. There were many difficulties in the way which, however, were overcome, and owing to the scarcity of tonnage and the consequent high rates prevailing, the venture has been highly satisfactory. Many of the cargoes carried were war supplies and munitions for Great Britain and her allies."

He dealt at some length with the big crops last year and their relation to the company as concerned in the transportation problem and proceeded: "Only part of this great crop has been moved as yet. All the terminal elevators at Port Arthur and Fort William are full of grain; the elevators in the interior also have vast quantities stored and it is estimated that over 50,000,000 of wheat alone are in the farmers' hands unmarketed, besides even larger quantities of oats. The railways cannot hope to cope with the situation, their efforts during the winter have hardly made an impression on the quantity to be moved. In fact, it will probably take all the rail and water facilities of the country combined to get this great crop away to the seaboard before the next crop begins to move. The rates being offered today for grain cargoes for spring and early summer movement and the large fleet your company has at its disposal for handling this traffic assures a sound business situation on the Great Lakes and St. Lawrence so far as we are concerned. We must not, however, overlook the fact, that last year's crop was a phenomenal one and we cannot expect as large a one in 1916, or, in fact, until the population of our Northwest increases. When our country can raise 750,000,000 bush. of grain in one crop with our present small population, what may we not expect when the population is doubled or trebled? Is it any wonder that we Canadians are optimistic as to the future? I am strongly convinced that after the war there will be a great flood of emigration from Europe and that it will be chiefly directed towards Canada, where the opportunities are greater than anywhere else in the world. I am also sure that the exodus of high class farmers from the United States to Canada will continue. Let us hope that our Government will make every effort to secure to us that proportion of new settlers that is undoubtedly our due."

After referring to the other features of the company's service he said. "On the whole, therefore, our prospects for 1916 may be considered promising, with every prospect of the promise being fulfilled."

"On the statement as presented, your directors would not be justified in declaring any dividend, however small. But your company in Jan. and Feb., 1916, earned from the operations of its boats on the Atlantic very satisfactory returns, as you will hear from our Vice President. From these earnings and entirely independent of the results of 1915 your directors decided to distribute on account of cumulative preferred dividends now owing to their shareholders, a part payment to the extent of 1¼%. These deferred dividends will continue to be paid in instalments, from time to time as circumstances may warrant. From present prospects it would be reasonable to expect a further additional payment in the near future."

"The majority of our preferred shareholders were once shareholders of Richelieu and Ontario Navigation Co., and I among other of the then directors of that company was more or less criticized in certain quarters for advocating the transfer to the Canada Steamship Lines, but as the results of the last two years have shown, the earning power of this company is largely in its freight boats, and the passenger boats, of which the R. and O. fleet was principally composed, have had two very disappointing years. If you are getting back dividends today it is the freight boats that are earning them for you. I feel, therefore, that the policy advocated by the directors and myself, namely, that it would be in the interest of the R.&O.N. Co. to enter into the arrangement, has been amply confirmed."

J. W. Norcross, Vice President and Managing Director, said: "Until the last of Aug., 1915, water transportation was almost a dead letter. This was due in freight transportation to the abnormally small crop of the year previous, and the fact that a large portion of this had been moved in the autumn of that year, therefore, leaving very small quantities of wheat and other grains for movement in the spring of 1915. The latter part of the year, however, was exceptionally good, and enabled us to recover a considerable portion of the losses which occurred earlier in the year. We sent seven of our lake ships to sea during the early part of this year, but as we had spent considerable money in getting them ready for this service, they did not begin to show results until near the end of the season, and the other vessels which were put in the ocean trade later in the year did not begin to show results until November. These latter vessels did not require as much expense in alterations. The 15 ships which we now have at sea, including the Quebec Steamship Co., are all making splendid returns. The passenger business, which before the opening of the season looked promising, did not fulfil our early impressions, due to a combination of circumstances, such as the continued reports that it was necessary to have passports."

"Prospects for the coming season, are very encouraging, the company on its freight vessels alone having earned approximately \$500,000 net to the end of Feb. This is very gratifying, as last year, up to April 15, we were minus in the neighborhood of \$370,000, comprising fitting out expenses, overhead expenses, etc. We have recently re-chartered a number of ships which are coming off time charter, at a greatly increased price

per month. We have booked a very large quantity of grain for movement in spring and summer, at a high rate, and there will be no scarcity of grain freights this year. Some of our assets have increased under present conditions from 50 to 70%, and in some cases over 100%, principally in freight tonnage. The passenger outlook is also very good. We have booked more party business up to the present time than in 1913, which was a very good year. Notwithstanding the exceptional expenses which we have been put to, and the higher cost of operating on the ocean at present, we reduced our operating expenses from 85.98% in 1914 to 77.74% in 1915."

The directors for the current year, who were re-elected, are: Commander Sir Trevor Dawson, R.N., Honorary President; Jas. Carruthers, President; J. W. Norcross, Vice President and Managing Director; Sir H. Montagu Allan, C. A. Barnard, J. R. Binning, J. C. Newman, H. B. Smith, E. Bristol, M.P., M. J. Haney, Hon. J. P. B. Casgrain, J. E. Dalrymple, G. H. Smithers, D. B. Hanna, Aemilius Jarvis, J. P. Stedman. The London advisory committee are: Sir Trevor Dawson, Chairman; Sir Vincent Caillard, F. W. Lewis, W. G. Morden, Lord Furness, Albert Vickers, C. G. Bryan.

Richelieu & Ontario Navigation Co.

The annual report of the directors of this subsidiary company says: "The shareholders of the company who have not yet exchanged their shares are now bearing the annual expenses of the company. The company has still to make Government tax and other returns, and in other ways incur occasional expenses, which, when all the shares of the company have been exchanged, will be paid by Canada Steamship Lines, Limited, but in the meanwhile can only be paid out of the dividends of Canada Steamship Lines, Limited when any are received, and when no such dividends are received, as during the past year, by means of advances obtained from Canada Steamship Lines, Limited."

Passengers on Great Lakes Freight Steamships.—The United States Department of Commerce has issued an order that boats carrying passengers must conform to certain requirements in their construction, and instructions have been issued to the inspectors to see that the rules are strictly observed. It is anticipated that this rule will put an end to the practice of carrying passengers on the average freight steamship, which, it is stated has grown to a considerable extent. The rule is interpreted as precluding masters of freight vessels from taking their wives on trips, but it is stated that vessel owners will leave that matter to the masters to decide, and protests are expected from the Shipmasters' Association as to such an interpretation being placed on the rule.

Henry Steamship Co., Ltd., has been incorporated under the Dominion Companies Act, with \$250,000 authorized capital stock, and office at Vancouver, B.C., to build, own and operate steam and other vessels, wharves, docks, piers, etc., and to carry on a general transportation business by land and water.

By-Water Magazine.—Canada Steamship Lines, Ltd., has commenced the publication of a monthly under this title, its particular aim being to advance the employees' welfare and to furnish information about the company's services, etc.

Shipping Letter from the Head of the Great Lakes.

F. & W. Jones, lake transportation brokers in Fort William, Ont., wrote on Mar. 11: Coal stocks at the Canadian head of the lakes are all pretty well depleted. Commercial coal has been drawn on almost to the vanishing point and there is still a big demand all through the western provinces. There is still a fair quantity of railway coal, but it is considered only sufficient for prospective requirements. By the time navigation opens coal piles are expected to be cleaned up and there will be ample space for all the coal that can be shipped up here. Dispatch in coal unloading will, without doubt, be on a record basis for a long time and every ton of coal will be required for quick shipment west. Our forecast at the close of navigation "that the amount of receipts were not at all adequate for the demand" has been fully verified.

Ice conditions are in every way favorable for an early opening. The large quantity of snow which has fallen has had the effect of preventing the making of over much ice. It would probably not measure more than 2 ft. thick in any of the passages and, at that, is brittle and easily broken up. Arrangements have been made for the ice breaking tugs to be ready for commission as soon after Mar. 15 as is found necessary and, under present conditions and prospects, movement in and out of the harbor should be active by April 1. There are 17 vessels (12 Canadian, 5 United States), all loaded with grain and ready for fitting out. These are expected to clear at any time after April 15. The s.s. Rosedale is still in dry dock light.

Terminal elevator grain stock at the Canadian head of the lakes stand, at the time of writing, at 35,000,000 bush. of all grains. They have been steadily piling up since the close of navigation. For many weeks the car arrivals from the west have been between 1,500,000 and 2,000,000 bush. a week, while the east bound rail shipments have not exceeded 750,000 to 1,000,000 per week. The total possible storage at these ports is 45,000,000 bush. It will thus be seen that there is ample space to take care of all arrivals pending opening of navigation, although it is anticipated that elevators will be blocked by then.

The all rail movements since the close of 1915 navigation have been disappointing, the total amount shipped scarcely reaching the 20,000,000 mark. Probably this will be increased by an additional 5,000,000 before the opening, making a possible total of 25,000,000 bush. shipped east. Arrivals from the west, up to time of writing have been slightly in advance of 45,000,000. If the stocks on hand at the close of 1915 are added (approximately 10,500,000), we have a total of 55,500,000 bush. handled during winter months at these terminals. Of this amount, 35,000,000 is still in store, with a possibility of reaching 40,000,000 to 42,000,000 by the opening of navigation. This small movement, while unavoidable on account of lack of railway facilities, is very disappointing as it leaves a large volume of grain yet to be moved and for which millers have been in urgent need.

Our earlier forecast of the total Canadian crop as 720,000,000 still stands as approximately correct, and is made up as follows: Wheat, 342,000,000; oats, 333,000,000; barley, 35,000,000; flax, 10,000,000. Of this there had gone forward at

the close of navigation by lake movement 171,000,000. All rail winter movement will account for about 25,000,000, as previously explained. 250,000,000 can be accounted for for domestic use, thus leaving a balance of 274,000,000 to be accounted for as available for shipment. The disposition of this balance would appear to be as follows: In store, terminals, 40,000,000 (at next opening); in store, Duluth, 5,000,000; in store, line elevators, 55,000,000; afloat, Fort William, 3,500,000; balance, 170,000,000. From these figures it will be seen that there is some 170,500,000 in various granaries, barns, farms and the land generally. Several million bushels are computed as still awaiting threshing and are considered in a precarious position. Reliable authorities calculate that it will be well into August before the whole of the 1915 crop has gone forward. The same authorities state that only approximately one third of the total crop has been moved. A steady good demand for vessel space must therefore be looked for right along and overlapping the new crop of 1916. With the large stocks of grain available and the assistance which the Board of Grain Commissioners will undoubtedly give, the dispatch in grain loading will probably be on a record basis.

The Lighthouse Board of Canada.

The Minister of Marine, in response to various questions in the House of Commons, recently, gave the following information respecting the Lighthouse Board of Canada. The board was constituted by order in council, Feb. 26, 1904. The Deputy Minister of Marine was appointed Chairman, June 8, 1910; the Chief Engineer, Marine Department, was appointed to the board, Feb. 26, 1904; the Commissioner of Lights, July, 1, 1908; Superintending Engineer of the St. Lawrence Ship Channel, Sept. 19, 1912; the President of the Shipping Federation of Canada, as representative of the shipping interests in the Atlantic division, Jan. 20, 1911; the President of the Dominion Marine Association, as representative of the shipping interests of the Inland division, Feb. 3, 1916; Capt. J. W. Troup, Victoria, B.C., as representative of the shipping interests in the Pacific division, June 6, 1906. The duties of the board are to enquire into and report to the Minister of Marine, to whom the board is responsible, upon all matters assigned to the Minister under section 833 of the Canada Shipping Act. The members of the board who are not officials of the Marine Department are allowed their travelling expenses for attending the board's meetings, and an honorarium of \$5 a day each, while attending such meetings. Since the dates of their appointment, A. A. Allan, President, Shipping Federation of Canada, has received \$576.30, and Capt. J. W. Troup, \$768.65. The Minister also stated that the Department had no knowledge of the connection of members of the board with transportation or steamship companies, except in the cases of Capt. J. W. Troup, who is Manager of the British Columbia Coast Service, C.P.R., and of W. E. Burke, President, Dominion Marine Association, who is Assistant Manager, Canada Steamship Lines Ltd.

Welland Ship Canal Construction.

The acting Minister of Railways and Canals, in speaking of the Welland Ship Canal, in the House of Commons recently said, "We are continuing the construction of the Welland Ship Canal, which we commenced in 1913, and the work under contract consist of sections 1, 2, 3, 4a and 5, no additional sections having been placed under contract during 1915. Section 1, which is under contract to the Dominion Dredging Co., consists of the construction principally of the new harbor at the Lake Ontario entrance to the canal, which covers $1\frac{1}{2}$ miles of dredging in the lake, and considerable pier work, $1\frac{1}{2}$ miles of canal excavation inland and the construction of lock 1, with its weirs and entrance walls. This contract is progressing satisfactorily and a very good showing has been made during the past year on the various works comprised in the contract. The estimated cost of section 1, based on schedule rates, is \$3,487,725, and \$1,529,120 has been paid to date.

"Section 2, which is under contract to Baldry, Yerburch and Hutcheson, includes in addition to the excavation of the canal prism, the construction of locks 2 and 3 with their regulating and waste weirs, the substructure of four bridges, in addition to the one over the head of lock 2, and a large amount of watertight embankments, and the contractors have been prosecuting the work vigorously during the past season. Their operations in the main have consisted of prism excavation, building watertight embankments, and the construction of the breast wall and upper entrance wall of lock 2. The estimated cost of section 2, based on schedule rates, is \$5,377,185.75, and the amount paid to date is \$2,351,970.

"The work on section 3 is under contract to O'Brien & Doherty, and Quinlan & Robertson, and comprises a very large amount of work, aggregating about \$10,000,000 in value, and consisting principally of the excavation of 2,700,000 cub. yds. of rock and 3,400,000 cub. yds. of earth, the diversion of the G.T.R., rendered necessary to obtain satisfactory location for the canal, the building of a large earth dam with concrete core walls, the building of twin locks 4, 5 and 6 in flight, and single lock 7, which together with their entrance walls, etc., will contain about 1,200,000 cub. yds. of concrete. The contract also comprises the crushing and furnishing of 1,250,000 tons of stone for concrete for sections 1 and 2. On this contract, \$2,249,290 has been paid.

"Section 4a is a small contract for certain portions of work which were to have been included in section 4, which could not be deferred when it was decided to postpone the letting of the larger contract. This has been completed by the contractors, Maguire and Cameron. The work was estimated to cost about \$80,000, and actually cost \$72,731.31. It consisted of the construction of a new supply weir opposite lock 25 on the present canal, to supply water to the old canal instead of the one at Allanburg which is being discontinued, as the old canal between Allanburg and the new weir is being filled in with excavated material from section 5, also the construction of two reinforced concrete culverts to take the place of open ditches across the area between the present and old canals, which is also being used as a dumping ground for excavated material from section 5.

"Section 5 is under contract to the Canadian Dredging Co., and consists of the deepening and widening of the deep

cut in the present canal between Allanburg and Port Robinson, to the new dimensions. Dry excavations above the water line have progressed continually during the past year, with the exception of a short interval last winter. Four or five steam shovels are operating day and night, the material mostly being disposed of on the dumping ground on section 4 between the present and the old canals. A long embankment dumped from a trestle has been formed, which, with the present canal tow path, encloses a large area of low ground which has to be filled to canal tow path level by the hydraulic suction dredge, thus reclaiming and making it valuable. On schedule prices this contract should cost about \$1,945,788, and \$903,720 has been paid on account."

Grain Clearance Association.

Montreal press dispatch, Mar. 23:—"A grain clearance association to adjust the differences arising between loading and unloading elevators and the shortages and overages of cargoes was formed at a special meeting this morning of the Dominion Grain Commission. It will be organized by A. A. Wright, Toronto; F. H. Piper, or D. Horn, representing the lake head elevators; D. Seath, representing the Montreal Harbor Commission elevators, and W. T. Stead, Port Colborne. Until the association is ready for business last year's arrangement whereby a fixed allowance for ultimate shortages and overages was agreed upon will remain in force. In view of the decision to form the clearance association the commission resolved not to make any further move toward securing Government weighing officials at the elevators."

In reference to the foregoing press dispatch we are advised that it goes too far in emphasizing the formation of a clearance association. The regulations for last year have been renewed for this year with practical unanimity in the trade, and the persons named in the press dispatch were appointed a committee to consider the formation of some general scheme to take care of all discrepancies in out turn in future years. The committee has no definite instructions and may consider any plan suggested, as that of the Buffalo Clearance Corporation, or a plan to pool shortages or overages under government supervision. The committee will report later on and any proposals must be confirmed by all parties. The meeting in Montreal was very satisfactory. All elevators from the head of the lakes to Montreal were represented and the Grain Commissioner was complimented upon the way in which the regulations are working out. The steamship owners were represented by W. E. Burke, Assistant Manager, Canada Steamship Lines Ltd., and President, Dominion Marine Association; A. A. Wright, Managing Director, St. Lawrence and Chicago Navigation Co.; L. L. Henderson, Managing Director, Montreal Transportation Co.; and F. King, Counsel, Dominion Marine Association.

Certificated Officers on Motor Boats.—

The Minister of Marine has given notice of the introduction of a bill into the House of Commons, amending the Canada Shipping Act, and providing that there need be only one certificated officer on a motor boat of over 5 tons and up to a maximum length of 65 feet, instead of two as at present. The amendment is desired by owners of sea going motor boats used in the fishing fleets, chiefly on the Pacific coast.

Canada Steamship Lines Ltd. Internal Organization.

The Canada Steamship Lines management has appointed a number of committees from among its officials, almost all the committees having, besides the head of the department immediately concerned, the assistance and advice of others who have close departmental intercourse with them. One of the effects of this arrangement is that all those who are affected by the questions arising have an outlet for ideas, criticism and suggestions on matters which, although not particularly concerning their own department, have an intimate relation to it. The committees are composed as follows:

General: W. E. Burke, F. S. Isard, H. W. Cowan, H. H. Gildersleeve, P. Paton, T. Henry, F. P. Smith, L. A. W. Doherty, G. Johnston, R. Duguid, J. F. Pierce, M. Cussen.

Pursers and Ticket Collectors: W. E. Burke, F. S. Isard, H. H. Gildersleeve, T. Henry, L. A. W. Doherty.

Appointment of Agents: W. E. Burke, F. S. Isard.

Captains and Engineers: W. E. Burke, H. W. Cowan, H. H. Gildersleeve, R. Duguid, G. Johnston.

Stewards: C. E. Croft, W. E. Burke, F. S. Isard, H. W. Cowan, H. H. Gildersleeve, T. Henry.

Purchasing: P. Paton, F. S. Isard, H. W. Cowan, H. H. Gildersleeve, R. Duguid, G. Johnston.

Terminal: W. E. Burke, H. W. Cowan, H. H. Gildersleeve, L. A. W. Doherty, T. Henry, R. Duguid.

The Treasurer, J. I. Hobson, is chairman of all the committees.

Trent Canal Progress.—The acting Minister of Railways and Canals, stated in the House of Commons, Mar. 9, that the Government engineers hope to have the Ontario-Rice Lake Division of the Trent Canal, lying between Peterborough and Lake Ontario, completed and open to navigation by the spring of 1917. The work still to be done consists of dredging river channels. All structures have been completed except the G.T.R. bridge at Campbellford, a few sluices in the dam at lock 10, and the hanging of the lock gates between Glen Ross and Healey Falls. When completed, vessels with a draught of 8 ft. will have access to Peterborough from Lake Ontario. The total estimated cost of this division is \$7,660,000, and about \$750,000 is still to be expended. On the Georgian Bay end of the Severn Division, the Port Severn lock and approaches have been completed, giving access to Gloucester pool from Georgian Bay. Good progress has been made on sections 2 and 3, which provide for the canalization of the upper reaches of the river. Owing to the war, the letting of the contract for section 1 has been deferred, and the completion of this will be necessary for through navigation. The total estimated cost of the Severn Division is \$3,575,000, and work to the value of \$1,250,000 has been done.

The Dominion Salvage and Wrecking Co. Ltd., has been incorporated under the Ontario Companies Act, with \$25,000 authorized capital and office at Toronto, to carry on a general salvage and shipping business.

The Panama Canal, which has been closed to navigation since Sept. 18, 1915, owing to landslides, will be reopened for vessels of deep draught, Apr. 15, according to an announcement by the acting Governor of the Canal Zone.

Atlantic and Pacific Ocean Marine.

A. Calder and Sons have been appointed agents for the Holland American Steamship Line, in Winnipeg.

From reports as to ice conditions in the St. Lawrence during March, it is anticipated that navigation will be opened between Apr. 20 and 27.

The Allan Line Steamship Co., and the American-Hawaiian Steamship Co., have each entered an action against the other, claiming \$82,000 for damages sustained by their respective steamships, Pretorian and Kansan, in a collision off the White Point light, in the St. Lawrence River, Sept. 15, 1915.

The Cunard Co. is reported to have purchased the steamships Anglo Bolivian, Anglo Californian, Den of Airlie, Den of Ogil and Luceric, renaming them, Vinovia, Vandalia, Valeria, Valodia and Valacia, respectively. They are all comparatively new vessels and have been engaged in trans-Atlantic trade for some time.

Maritime Provinces and Newfoundland.

The Eastern Car Co., Ltd., has deposited with the Public Works Department, plans and description of a wharf to be built, and a turning basin to be dredged in the East River, at Stonehouse Point, Pictou, N.S.

Meetings of shareholders in the Thetis Steamship Co., and the Nascopie Steamship Co., were called to be held at St. John's, Nfld., recently, to receive the accounts and reports of the winding up of these companies.

The old immigration building situated on pier 2 at Halifax, was destroyed by fire, Mar. 14. In addition to this building, the Intercolonial Ry. building was also destroyed, together with records, as was the pier. The damage is estimated at \$100,000.

The Dartmouth Ferry Commission reports the earnings for two months ended Feb. 29, as \$11,866, against \$10,783 for the same period 1915. The expenditures for the same periods were \$8,543 and \$8,194 respectively. Respecting the carrying of soldiers free on the ferries, it was stated that the orders referred only to soldiers on military duty, and not to those travelling for pleasure.

With reference to the recent report that the Nova Scotia Steel and Coal Co. was to undertake the building of steel vessels, we are officially advised that it is not at all unlikely that the company will, during the coming summer, build a steel coasting steamship of about 2,000 tons deadweight capacity, at its New Glasgow, N.S., works. Such a vessel will be specially designed for the company's coasting trade.

The port of St. John, N.B., is having a record season. Up to the end of February the arrival of ocean steamers for the winter season numbered 125, against 94 for the same period last year. The C.P.R. has delivered nearly 500,000 tons of freight this season, against 300,000 last winter. The pay roll to longshore men this winter is estimated at from \$250,000 to \$300,000. During one week recently the C.P.R. paid out \$37,000 for labor on its steamships alone.

Agents representing fishing companies in Newfoundland are visiting shipping centres in Canada and the United States, for the purpose of buying up any avail-

able sailing vessels for the fishing industry. Most of the steamships usually engaged in the Newfoundland trade have been otherwise employed during the war, and as elsewhere, there is a shortage of tramp steamers, so that sailing vessels will have to be employed to carry salt fish to Mediterranean ports.

Province of Quebec Marine.

The Quebec and Levis Ferry Co's s.s. Queen, which has replaced the same company's s.s. Pilot on the Murray Bay-Tadousac route, made her first trip Mar. 15.

The Quebec Board of Trade has started a campaign amongst local members of the Dominion Government, to obtain a share in the overseas shipment of Government war supplies, etc., equal to Montreal.

The Quebec Harbor Commissioners' new grain elevator with capacity for 1,000,000 bush. is complete with the exception of conveyors for steamship delivery. Some local grain has already been handled there, and western grain is now being stored. Considerable progress was also made during the past year with the new steamship frontage on the north side of the Louise dock, and when completed there will be accommodation for four additional steamships.

Ontario and the Great Lakes.

Work on the construction of the new wharf at Sarnia, for the Northern Navigation Co., was started Mar. 18, by the G.T.R.

Work is reported to have commenced on the construction of two large steel steamships for the lake trade, at the ship-building plant at Port Arthur.

The G.T.R. is reported to have decided to build a freight shed, 1,200 ft. long, at Point Edward this year, and it is also reported that a large grain elevator will be built there.

The Public Works Department commenced taking soundings in Kingston harbor early in March, in preparation, it is said, for extensive improvements to be made in connection with a deep waterways scheme.

It is reported that the Northern Navigation Co., in arranging its summer schedule, has decided to eliminate Mackinac Island as a calling port, owing to the tourist trade having fallen off considerably during the past few years.

The Geo. Hall Coal Co's s.s. George L. Eaton was launched at Wyandotte, Mich., Mar. 11. She is 244 ft. long, 43 ft. beam and 20 ft. deep, with carrying capacity of 3,000 tons. On completion she will enter the coal trade on the lakes and St. Lawrence River.

The Northern Navigation Co's s.s. Saronic, which was damaged by fire recently, when the same company's s.s. Majestic was destroyed, is being repaired at Sarnia, and it is expected will be ready for the reopening of navigation. It is reported that the repairs will cost about \$25,000.

The s.s. Quinte Queen was announced to be offered for sale by public auction, at Ottawa, Mar. 28. She was built at Kingston in 1902, and was formerly known as Salaberry. Her dimensions are, length 99.5 ft., breadth 20.9 ft., depth 4.7 ft.; tonnage, 203 gross, 143 register. She is equipped with fore and aft compound

condensing engine, with cylinders 9 and 18 ins. diam., by 12 ins. stroke, electric light, etc.

Canada Steamship Lines, Ltd., has decided to establish a wharf at Port Metcalfe, at the foot of Wolfe Island, St. Lawrence River, and it is said that the transfer of passengers from the steamships Toronto and Kingston for Clayton and other Thousand Island points in the United States will probably be made there instead of at Clayton.

The Dominion Privy Council has concurred in the recommendation of the Ministers of Marine and Public Works, regarding the establishment of a permanent harbor head line at Toronto, from Bathurst St. to a point opposite Yonge St., beyond which line, wharves, piers, breakwaters and other similar structures shall not in future be built.

The C.P.R. steamships Assiniboia and Keewatin, which are about completing their winter overhaul at Owen Sound, will when ready for the reopening of navigation, present a somewhat different appearance than heretofore. The upper works at the stern are being extended for the full length of the main deck, providing additional cabin and other passenger accommodation.

The Rainy River Navigation Co's steamships Agwinde and Keenora, were offered for sale by auction at Toronto, Mar. 27, by order of the Exchequer Court of Canada, Toronto Admiralty District, as the result of a suit by the Imperial Bank. The s.s. Agwinde was built at Kenora, Ont., in 1900, her dimensions being, length 105 ft., breadth 22.5 ft., depth 4 ft., tonnage, 307 gross, 143 register. The s.s. Keenora was built at Kenora in 1897, her dimensions being, length 119.9 ft., breadth 28 ft., depth 8.3 ft., tonnage, 486 gross, 269 register.

The Northern Navigation Co's s.s. City of Midland was burned to the water's edge, at Collingwood, Mar. 17. She was undergoing a general overhaul and repair, and it is assumed that the fire was due to carelessness on the part of some of the workmen. She was built at Owen Sound in 1890 and was originally owned by the North Shore Navigation Co., the forerunner of the Northern Navigation Co., which is now subsidiary to Canada Steamship Lines Ltd. The hull was of oak, and she was equipped with fore and aft compound engines with cylinders 20 and 40 ins. diam. by 32 ins. stroke, 380 i.h.p. at 85 r.p.m., and supplied with steam by a single Scotch boiler 12 by 11¾ ft. at 127 lbs. Her dimensions were: length 176 ft. 4 ins., breadth 28 ft. 3 ins., depth 10 ft. 7 ins.; tonnage, 974 gross, 662 register.

The s.s. Sarnor, owned by H. M. Norris, Montreal, is announced to be offered for sale Apr. 1. She has been laid up at Port Colborne for about a year, with claims of about \$20,000 against her. She was built at West Bay City, Mich., in 1888, and rebuilt in 1901, and was formerly known as Britannic. The hull is of oak with diagonal strapping on the frames, and with the bow sheathed for ice, steel arches and steel boiler house. The propelling machinery consists of fore and aft compound engines with cylinders 24 and 48 ins. diam. by 40 ins. stroke, 495 i.h.p. at 82 r.p.m., and is supplied with steam by a boiler of the fire-box type, 10½ by 15½ ft. at 115 lbs. Her dimensions are: length 219 ft., breadth 36 ft., depth 20 ft.; tonnage 1,319 gross, 1,152 register. She was used in the coal trade between Lake Erie ports and Montreal.

Manitoba, Saskatchewan and Alberta.

The Peace River Tramway and Navigation Co's s.s. D. A. Thomas, at present under construction at Peace River Crossing, Alta., is expected to be ready for service by May. She will be 175 ft. long by 40 ft. beam, and will have a speed of 16 knots an hour in still water. The Peace River has a current of about 4 miles. She will be placed on the run from Vermilion Chutes, Alta., to Hudsons Hope, B.C., about 570 miles, and will handle a cargo of about 2,000 tons, of which 500 will be on her decks, and the balance in scows. She is being equipped with every modern convenience, including electric light, hot and cold water supply, etc. Oil storage tanks are also being installed, but until the oil supplies are developed, cordwood will be burned. All the timbers for the hull were shipped from Vancouver via Calgary and Edmonton, and thence by the Edmonton, Dunvegan and British Columbia Ry. to the end of rail, from whence they were teamed for the remainder of the distance, 35 miles, to Peace River Crossing. She is being equipped with two boilers, supplied by Polson Iron Works, Ltd., Toronto.

British Columbia and Pacific Coast.

The Union Steamship Co's s.s. Camosun, grounded near Lima Point, at the entrance to Prince Rupert harbor, Mar. 1.

The C.P.R. s.s. Princess Maquinna, which was beached at Menzies Bay, after striking on Maud Island, Feb. 1, has been overhauled and repaired at North Vancouver and resumed service. The work included the fixing of a number of plates and repairs to the engine room.

The C.P.R. s.s. Otter, which was wrecked on Sidney Island, Oct. 9, 1915, when going to assist the wrecked s.s. Mariposa, which had run ashore on Napier Point, Campbell Island, the previous day, has been salvaged, and was taken to Victoria for overhaul and repairs at the end of February.

The Grank Trunk Pacific Coast Steamship Co's s.s. Prince Albert commenced a fortnightly service, Mar. 15, from Vancouver, calling at way ports to Prince Rupert and Stewart, returning to Prince Rupert and thence to Queen Charlotte Islands, returning again to Prince Rupert and thence to Vancouver.

M. H. MacLeod, General Manager, Canadian Northern Ry., is reported to have stated, while in Vancouver recently, that two steam tugs had been purchased in Victoria, for the company's ferry service between the mainland and Vancouver Island, and that tenders for the construction of barges for transferring cars would be called for shortly.

The Grand Trunk Pacific Coast Steamship Co. has sold its s.s. Henriette to the Coastwise Steamship & Barge Co., Vancouver. The Henriette, which was formerly a sailing vessel, was acquired by the G.T.P.C.S. Co. in 1910, and is equipped with engine of 32 n.h.p. driving a screw. Her dimensions are: length 160 ft., breadth 30 ft., depth 18.9 ft.; tonnage, 762 gross, 518 register.

The Dominion Government s.s. Quadra, which was sunk off Nanaimo harbor, Feb. 26, as the result of a collision with the C.P.R. s.s. Charmer, is to be sold as she

lies under water, just visible at low tide, near the entrance light of the harbor. She was built at Paisley, Scotland in 1891, and was screw driven by engine of 120 n.h.p. Her dimensions were, length 174.5 ft., breadth 31.1 ft., depth 13.6 ft.; tonnage, 573 gross, 265 register. She was valued at about \$80,000, and was utilized in the lighthouse and buoy service along the Pacific coast. An official enquiry was opened early in March at Nanaimo, by Capt. J. D. Macpherson, Wreck Commissioner for British Columbia.

A bill has been introduced in the House of Commons granting additional powers to the Vancouver Harbor Commissioners to charge certain fees within the territory of their jurisdiction. The Shipowners' Association of British Columbia, on Mar. 10, telegraphed a protest to the Minister of Marine, intimating that a press report that the bill had been introduced was the first knowledge that the Association had of the matter, and asking that shipping and lumber interests should be given an opportunity of expressing their views. The Minister replied that the bill merely gave authority to the Commissioners to enforce fees subject to the approval of the Governor in Council, and that no fees would be imposed without due consideration.

Steamship Line between America and Russia.—R. Martens and Co. Inc., has been incorporated in Delaware, with the object of establishing a steamship line between United States and Russian ports. Lord Rhondda, who is associated with several transportation projects in Canada, is President of the company, R. C. Martens of Petrograd is Vice President, and J. H. Torney, until recently Assistant Manager, Atlantic Steamship Lines, Southern Pacific Co., has been appointed Manager. For the present, it is stated that a service will be given between New York and Archangel, and on the conclusion of peace, a direct service between New York and Black Sea ports will be provided. The company has leased the new municipal pier at Stapleton, Staten Island for 20 or 30 years, at an average rental of \$50,000 a year. While visiting in Canada recently, Mr. Martens is reported to have stated that should the Canadian traffic offering justify it, some of the vessels would call at Canadian ports, and as such trade grew, vessels would sail direct to Montreal or Halifax.

Closing of Lights in the Gulf of St. Lawrence.—The statement in the preface to the Marine Department's list of lights and fog signals on the Atlantic coast, to the effect that the lights are maintained in operation whenever navigation in the vicinity is open, is qualified by the announcement that experience has shown that the average date for placing lightships in the spring, is Apr. 20, and for their removal, Nov. 28. As it is impossible to communicate with many isolated stations in the Gulf late in the autumn, navigation in the river and Gulf will be declared closed on Dec. 23, and the lights will be extinguished after the night of Dec. 22. If for any exceptional reason it is found desirable to extend the date, arrangements can be made through the Quebec agency for notifying such stations as can be reached by telegraph or telephone, but the most remote stations and some island stations cannot be reached. The lights at Cape Ray and Cape Anguille, Nfld., are kept in operation until Jan. 31.

Mainly About Marine People.

H. A. Calvin, of the Calvin Co., Kingston, Ont., has been elected President of the Kingston Canadian Club.

Francis King, M.A., Counsel, Dominion Marine Association, has been elected President of the Kingston, Ont., Board of Trade.

A. S. Maynard, heretofore Chief Commissary Agent, C.P.R., Montreal, has been appointed Purchasing Agent, Canadian Pacific Ocean Services, Ltd., Montreal.

Capt. Isaac Watt, a local shipmaster, has been appointed wharfinger of the Government dock at Windsor, vice Jas. Reid, who has resigned on account of ill health and pressure of other duties.

G. P. Browne, Managing Director, Montreal and St. Lawrence Ports Stevedore Co., died at the Royal Victoria Hospital, Montreal, Mar. 7, aged 65, from blood poisoning, the result of an accident over a year ago.

J. J. Nelligan, District Freight Agent, and Geo. Hearn, Soliciting Freight Agent, Canada Steamship Lines, Montreal, have qualified as officers at Halifax, N.S., and will go to the front in the 199th Battalion, Irish Rangers, C.E.F.

Lady Montagu Allan, of Montreal, who is living at Folkestone, Eng., for the present, is devoting much attention to wounded soldiers in the local hospitals, and frequently takes parties of them for drives or to moving picture shows.

Shortage of Ships on Atlantic Coast.—In the House of Commons, Mar. 21, Hon. W. Pugsley asked whether the Canadian Government was consulted in connection with the requisitioning of Canadian vessels engaged in the coastwise trade. A coal famine was threatened in St. John, N.B., as the result of the taking away by the British authorities of many vessels so engaged. Sir Robert Borden replied that the whole situation was a very difficult one, not only so far as Great Britain was concerned, but all the other allied countries which needed tonnage. With regard to the requisitioning of Canadian coasting vessels, he agreed that the Canadian Government should be consulted. Sometimes it had, but not always. The needs of the war might be so great that Canada could not object. In any case, he hoped the St. John situation would be satisfactorily alleviated.

The s.s. Port Dalhousie, owned by Forwarders Limited, Kingston, which has been engaged in ocean service in Europe for some time, was sunk at sea, Mar. 19, presumably by a German torpedo, while bound from South Wales to France with grain. She was built at Middlesbrough, Eng., in 1913, and was of steel with 3 watertight and 2 nonwatertight bulkheads, steel boiler house, and equipped with triple expansion engines with cylinders 14½, 24½ and 40 ins. diam. by 30 ins. stroke, 650 i.h.p. at 85 r.p.m., supplied with steam by a Scotch boiler 14 by 11½ ft. at 180 lbs. Her dimensions were, length 250 ft., breadth 42½ ft., depth 19 ft.; tonnage, 1,744 gross, 1,129 register.

Tonnage of Canadian Registered Vessels.—The Minister of Marine stated in the House of Commons recently, that the aggregate net tonnage of all steam vessels on the Canadian register for 1910, was 337,721, and the aggregate annual increases were, 1911, 17,864 tons; 1912, 34,149 tons; 1913, 39,562 tons; 1914, 25,772 tons; 1915, 7,387 tons.

Economic and Strategic Aspects of Enlargement of Welland Canal and of Construction of Georgian Bay Ship Canal.

By R. W. Leonard, M.Can.Soc.C.E., St. Catharines, Ont.

This is a most important subject for debate by the Canadian Society of Civil Engineers, because it involves vitally the probability of continued existence of our international boundary, as well as the question of the economic expenditure of vast sums of money, and because it is a question that should be solved by civil engineers. Internationally, the question involves the use of constricted waterways at Sault Ste. Marie, St. Clair River, Detroit River, Welland Canal and St. Lawrence River by both peoples, some of which waterways are on one side of the boundary and some on the other, and the effect of such a condition in case of friction unhappily arising between Canada and the United States. Commercially, the economics of the projects can be compared with transportation by rail and with one another. The expenditure involved and where it is spent, and the effect of the expenditure upon the country as a whole, are most important. Civil engineers alone can make the surveys and determine the physical possibilities of construction, the cost of construction, and the relative engineering advantages or disadvantages in the construction, maintenance and operation, as compared with railway transportation on the one hand, and the one canal project with the other on the other hand. This question is apparently of such wide scope, and involves technical detailed knowledge of so great variety that the writer submits it affords ground for much valuable discussion, which it is to be hoped will be elicited by this admittedly imperfect and faulty paper, contributed with diffidence, but in good faith, by the writer as his view.

The present canal system of commercial importance consists of:—

Sault Ste. Marie Locks:—

- 1—on Canadian side 900 x 60 x 19 ft. draft being operated.
- 1—on United States side 600 x 100 x 14 ft. draft being operated.
- 1—on United States side, 800 x 100 x 19 ft. draft being operated.
- 1—on United States side 1,250 x 80 x 24½ ft. draft, opened Oct. 21, 1914.
- 1—on United States side expected to be ready in two or three years.
- Channels in United States territory below locks at Sault.
- Channels in Canada and United States in St. Clair River.
- Channels in Canada and United States in Detroit River.
- Welland Canal, including 24 locks, 270 x 45 x 14 ft. draft.
- St. Lawrence canal system, 26 locks, 270 x 45 x 14 ft. draft.

After the war of 1812 the British Government, recognizing the necessity of having a line of communication for military purposes away from the boundary, canalized the Ottawa River from Montreal to Ottawa, and the Rideau and Cataraqui Rivers from Ottawa to Kingston for barges drawing 5 ft. of water, at a cost of \$3,911,700, which system they subsequently gave to Canada free of cost. These last two systems, however, interesting to the summer tourist as canoe and yachting routes, are not of great economic or strategic importance under modern conditions. The cost, maintenance, operation and repairs for the year 1913 was \$309,822.65, and the tonnage passing through (mainly pleasure boats, cordwood, lumber and sand) amounted to 227,023 tons.

About 1904 the Dominion Govern-

ment's Public Work Department started a survey of the Ottawa-French River route for the purpose of arriving at the cost of a 22 ft. ship canal. The result is embodied in a very voluminous report, dated 1908, including estimates as follows:—

Total length of canal.....	440 miles, including:—
Free navigation.....	346 miles
Improved channels.....	66 miles
Excavated canal.....	28 miles
Total	440 miles, 22 ft. deep.
Costing	\$100,000,000.00

The system is estimated to be capable of developing 1,000,000 h.p. on the direct canal route, and this estimate might probably be doubled by figuring the power developed in regulating the tributary streams.

It is significant that about the same time the Department of Railways and Canals commenced to make surveys to determine the possibility of enlarging the Welland Canal from the present 14 ft. draft to 30 ft. These surveys were completed in 1913 and the parliamentary estimate for that year included \$2,000,000 for the enlargement of the Welland Canal and \$5,000,000 for canalizing the French River from Georgian Bay to Lake Nipissing. The total estimate of the cost of enlarging the Welland Canal, 26 miles, is reported to be \$50,000,000, probably two-thirds of which will be expended in the United States for fuel and machinery, and in various foreign countries in the form of wages sent home by laborers. The lift of 325 ft. is overcome by 7 locks of 46.5 ft. lift, 800 ft. long x 80 ft. wide x 30 ft. draft.

The St. Lawrence Canals enlargement has not been surveyed and no information is therefore available to indicate whether corresponding enlargement to suit that at the Welland Canal is physically possible at any cost of construction, and the people of Canada have not been informed of any treaty with the United States sanctioning such deepening of international dams, etc.

During 1913-14 contracts were let for construction of about 10 miles of the the Welland Ship Canal, including all the locks, at a cost of probably \$35,000,000 and the work of excavation is possibly half done.

Internationally considered, this question is of supreme national importance, as involving such questions as national defence and the very possibility of holding Canada for the Empire. In this connection, it must be borne in mind that New York State is enlarging the Erie Canal from Troy to Oswego and to Buffalo, from 6 or 7 ft. draft to 12 ft. with a lock length of 311 ft., and width of 45 ft., to accommodate barges of 1,500 tons capacity, and these canals will open Lakes Ontario and Erie to formidable U.S. war vessels, giving them absolute control of these lakes at all times, unless Canada be supplied with similar transport facilities apart from the boundary waters of the St. Lawrence River from Kingston to Prescott. The enlargement of the Welland Canal will also carry a great preponderance of large U.S. steel freighters into Lake Ontario, thus giving to that country an undisputed control of that lake. Canada has enjoyed a century of peace with her powerful southern neighbor, and it is the wish of all good

citizens to enjoy another one, even avoiding in the coming century such incidents as the Trent affair, the Fenian raids, Venezuela messages and the Panama Canal question, and serious boundary disputes, fishery disputes, international water power questions, etc., to say nothing of United States Senate Reports, 1889-1890 (testimony of Joseph Nimmo, Jr.), etc. Such questions having arisen in the past, however, they will naturally arise in the future, and the peaceful settlement of them depends largely upon the temper and temptations at the time. So long as an international boundary is to be retained, so long should the policy of Canada be to preserve peace while safeguarding her honor and interests.

It is not apparent to the public that this canal problem, probably Canada's most expensive commercial project under construction, has been considered by the Canadian people from the national point of view, though pamphlets have been published ad nauseam by boards of trade of various municipalities treating the subject in a spirit of parochial politics, each exaggerating the advantages of one route and the disadvantages of the other, the very apparent incentive in each case being the expenditure of public money on the construction in the immediate vicinity of the municipalities interested. If the question be approached from a purely economic point of view, it is probable that freight (and grain from the prairies to the Atlantic seaboard in Canada is the most important commodity at present) can most cheaply be handled by rail from Winnipeg to Fort William and Port Arthur, by ship to Georgian Bay, and by rail over a direct line with easy gradients to Montreal, cheaper than by any canal at present built or proposed. On this route the C.P.R. has a double track from the west to Fort William; the Grand Trunk Pacific and the Canadian Northern have each a single track between the same points. There is a large fleet of U.S. steamships engaged in the coal, grain and ore trade on the lakes, and the Canadian fleet is growing rapidly. The C.P.R. has a line with easy gradients from Port McNicoll, on Georgian Bay, where it has built large grain elevators, to connect with its Toronto-Montreal line, with a view to carrying grain in competition with the canals, and it probably has estimates of comparative cost warranting the expenditure, even under the unequal conditions that the traffic by the railway must pay interest, depreciation and upkeep, while the Government assumes these enormous sums in the case of the waterways, making the canals free to all ships alike, Canadian and foreign.

The people are educated to demand water transportation "to regulate rail freights," and to what extent a larger canal than the present 14 ft. Welland-St. Lawrence system will result in a reduction of rates is a question that can be figured in many different ways with varying results. Figures have been prepared by competent authorities showing that the maximum saving in freight on wheat from Fort William to Montreal by the enlargement of the Welland Canal will be ¾c. a bushel, which will amount to \$187,500 a year on 50,000,000 bushels at a cost in interest on \$50,000,000, of say

\$2,000,000 a year, plus depreciation, upkeep and operation. Return cargoes of coal are obtained in Lake Erie port. Probably few will contend that 14 ft. draft ships are not economical for package freight from Lake Ontario or St. Lawrence points. It would be of interest in this connection to have a report on the feasibility and cost from an engineering point of view of lengthening the existing locks on the Welland and St. Lawrence canals 100 ft., and the economic results of such lengthening if it be practicable.

To analyse and compare the respective advantages and disadvantages of these two routes. Assuming that the Government enlarges the Welland Canal and proposes to canalize the French River to North Bay only. The estimate for the enlargement of the Welland is generally stated to be \$500,000,000; which amount at 4% interest, together with amortization, upkeep and supervision of the two existing canals and the proposed canal, may be estimated at another \$1,000,000, or a total of \$3,000,000 a year, which sum is probably under the mark, unless all past experience in cost of Government contracts be reversed.

Assuming the distance from Port McNicoll to Montreal to be 400 miles, and a paying freight rate to be 4/10c. a ton mile, or \$1.60 a ton, or 5c. a bushel, then \$3,000,000 a year would pay the rail freight from Georgian Bay to Montreal on 60,000,000 bushels, which is much greater than the amount of grain and flour shipped in the past from Montreal in any one year, and 50% greater than the greatest Canadian tonnage through the Welland Canal bound down in one year.

This enlargement of the Welland Canal will not materially increase the water power development, as that is regulated by international treaty, and works out so that, though Canada owns two thirds of the water flowing over Niagara Falls, she gets the use of only one third of the power development therefrom, the U.S. getting two thirds. It is manifest that the only saving effected by enlarging the Welland will be that effected by the difference in freight rates between 2,000-ton ships from Port Colborne to Montreal vs. 8,000-ton ships from Port Colborne to Prescott, plus 2,000-ton ships from Prescott to Montreal, estimated above at 3/8c. a bushel on wheat.

Oswego is about 150 miles nearer by Erie Canal to Troy than is Buffalo, and, as the enlarged Welland Canal will be, by treaty, free to U.S. ships, their largest lake ships will deliver grain cargoes to 1,500-ton U.S. barges at Oswego, in the New York State Barge Canal, for New York, instead of into 200 or 300-ton barges at Buffalo as at present, and thus compete with large Canadian ships discharging into 2,000-ton barges at Prescott or Kingston for Montreal. In the past the little Erie Canal boats taking grain from Buffalo to New York have been very keen competitors against the St. Lawrence route. What will be the result of the new conditions when in operation? It would appear that the expenditure on the proposed Welland Canal enlargement when completed will be quite as much to the advantage of the U.S. as to Canada and during construction probably much more than half the cost goes to the U.S. for coal and machinery.

The canalization of the French River to North Bay to a depth of 22 ft., a distance of 82½ miles, is estimated to cost \$14,275,000, and would develop 35,000 h.p. It could bring coal and coarse

freight to North Bay for railway distribution, and return pulp-wood and probably ores from that district, and partially develop a lot of power for which there is probably no immediate market in sight, but the value of which will doubtless be very great in a few years if we judge from the phenomenal increase in the use and value of hydro electric power during the past 20 years. Probably this construction is warranted only in anticipation of the completion of the entire canal to Montreal.

Assuming that the appropriations in the estimates for the Welland and French River works are preliminary to the extension of each system through to Montreal. The Welland-St. Lawrence system, unless an entirely new route inland to the north of the St. Lawrence can be found, passes through international waters from Kingston to Cornwall, and probably nothing can be done toward enlarging this portion without international agreement, including a natural demand by the U.S. for a share of the power development, (loosely estimated at 20,000,000 h.p. by some writers in the press.) Would the U.S., having the free use of the enlarged Welland to carry their big ships to Oswego, the end of their Erie canal, consent to the enlarging of the St. Lawrence system to divert the trade from Troy and New York to Montreal? What share of the expense would they bear? What share of the power development would they demand? Sufficient information is not available to indicate the nature or cost of such an enlargement of the St. Lawrence canals, to a depth of 22 feet.

In the case of the Ottawa-French system, careful surveys and estimates have been made by the Public Works Department. The total length of the canal is 440 miles, of which 346 is free navigation, 66 in improved channels and 28 in excavated canal. The cost is estimated at \$100,000,000. The system is estimated to be capable of developing 1,000,000 h.p. on the direct route and 3,000,000 h.p., including the tributaries which probably within 2 years will, if carefully conserved and utilized by the nation be worth from \$20 to \$100 a year per horse power utilized, over the cost of production from coal, depending upon the purpose for which it is used.

In the absence of authentic estimates and reports on the St. Lawrence route, it is impossible to compare the two routes as to practicability, cost, time of transit and economy of operation. It is not known whether the St. Lawrence enlargement is at all possible due to international questions. If it be possible, then the two systems can be compared in regard to length and total height of locking only. From Lake Superior to Montreal the Ottawa route is 661 miles long, and the total lockage up and down is 780 ft. The Welland-St. Lawrence route is 943 miles long, and the total lockage is 578 ft. Both routes pass through U.S. waters in the St. Mary River. The St. Lawrence route passes through contracted international waters at St. Clair River, Detroit River and St. Lawrence River. The deepened Welland-St. Lawrence Canal would be found to have probably three times the length of actual excavated canal and about the same length of restricted river navigation, as compared with the Ottawa route. Much has been written about fogs, rock excavated channels and sharp curves on the Ottawa route. Any Canadian knows that the St. Lawrence probably suffers quite as much as the Ottawa from fogs. About

half of the existing Welland Canal is in rock excavation and the new canal will not have less. It is not known how much of such channels the proposed St. Lawrence enlargement will include. The Ottawa route has sharp curves, so has the Thames below London, and it is not known what curves will be required on the proposed St. Lawrence enlargement. There are, however, sharp curves in swift currents in St. Mary River at Neebish and other points. Without surveys the distances through restricted waters cannot be compared and therefore neither the time necessary to pass through, nor the dangers of navigation. The St. Lawrence route is known to be longer and will demand greater fuel consumption per ton of freight, and probably more time in transit. The weeks per year when they will open for navigation will probably not greatly differ, although the St. Lawrence system would doubtless have a slight advantage in this respect.

If, as shown above, the annual expense of enlarging the Welland Canal alone would pay the freight on double the quantity of wheat and flour at present carried per year from Lake Huron to Montreal, it is unnecessary to prove that, commercially speaking, neither scheme can be defended as a canal solely. Without further information they cannot be compared physically, nor is the possibility of the St. Lawrence enlargement even sure.

Pending the result of discussion the writer cannot avoid the following conclusions: 1.—Neither canal system can be made, as a canal, a commercial success; 2.—On account of the geographical position and abundance of power capable of being developed along the Ottawa-French River system, that canal and power development, if undertaken by the Government, could probably be made a commercial success in a few years and would be a very valuable asset in case of international disputes, giving Canada a chance for defence on the Upper Lakes that she can never enjoy without it. This canal might be considered by the Dominion Government on the same basis as colonization railways which have been freely encouraged all over Canada. 3.—The possibility of the enlargement of the St. Lawrence system is as yet undetermined, as it requires the co-operation of the U. S. 4.—The cost and value of the power development thereon is unknown as no international agreement, surveys or estimates have been prepared. 5.—The enlargement of the Welland Canal, without a corresponding enlargement of the Welland-St. Lawrence system, will at least benefit U.S. quite as much as Canadian interests, and it is questionable if it will not divert trade from Montreal to New York. 6.—It would give the U.S. control of Lake Ontario in case of international trouble, and be an important factor contributing to the probable loss of the wealthiest and most populous part of Canada.

The Dominion Government has appointed a Commission recently to report on the proposed Ottawa Ship Canal, which doubtless will add much to the present knowledge of the commercial feasibility of this project, and it is to be hoped of an alternative project of a 14 ft. barge canal. It is to be hoped that it will also give some similar information regarding the enlargement of the Welland Canal and the proposed extension of the enlargement to Montreal that will guide the Government in deciding on the wisdom of such vast expenditure of public money before the projects are actually

undertaken. It is to be regretted that a similar Commission had not been appointed before the Government committed the country to the expenditure of several hundred millions, on the simultaneous construction of two additional transcontinental railways, and numerous other expensive projects.

The following figures are added for reference. They have been taken from Canal Statistics, Department of Railways and Canals, 1911, and Report of Government Engineers on Georgian Bay Ship Canal, 1908. It is very difficult to get definite and accurate information regarding water transportation costs, which heretofore have not been obtained by the Government, and some of these figures are subject to correction; especially those relating to freight rates, insurance charges and interest, which are liable to change from year to year.

Distances—

	Miles
Fort William to Montreal, via Georgian Bay Canal	934
Fort William to Montreal, via Welland Canal	1,216
Fort William to New York, via Erie Canal	1,358
Proposed Georgian Bay Canal—	
French River Village to North Bay...	82½
North Bay to Montreal harbour.....	357½
	440
Free navigation.....	346
Improved channel.....	66
Canal excavation.....	28
	440

Canal Depths—

Proposed Georgian Bay Canal...	22 ft.
Welland-St. Lawrence Canals...	14 "
Proposed Welland Canal.....	24 "
Sault Ste. Marie Canal (Canada)...	20.2 "
Sault Ste. Marie Canal (U.S.)...	16 and 20.5 ft.
Erie Canal	7 ft.
New York State Barge Canal...	12 "

Excavation in St. Mary River, below the locks, has materially reduced depths over lower sills below figures in the above table.

	Up and down
Lockage—	
Proposed Georgian Bay Canal	27 locks 758 ft.
Existing Welland Canal.....	26 " 326 "
Proposed Welland Canal.....	7 " 326 "
St. Lawrence Canals.....	22 " 207.5 "
Erie Canal	72 " 660 "

	Bush.
Rates	
Water rate on grain Fort William to Montreal	4½c.
Water rate Fort William to Buffalo	3½c.
Rail rate Buffalo to New York	5½c. 9c.
All water rate Fort William to New York. 5.3c.	
Water rate Fort William to Buffalo is at times as low as 1½c. per bush.	

Although distance and rates are in favor of Montreal, diversion to U.S. ports is due to the following reasons: Availability of ocean tonnage at New York. Lower ocean rates between New York and foreign ports. Lower insurance rates from New York.

Insurance—

Montreal, 65c. to \$1.10 per \$100.	
New York, 12½c. to 15c. per \$100.	
Cost of existing Canadian canals, Fort William to Montreal.....	\$80,000,000
Interest at 3½ per cent.....	\$2,800,000
Maintenance and operation. 1,400,000	4,200,000
Water freight rate per ton mile, Fort William to Montreal.....	0.163c.
Interest and maintenance.....	0.135c.
	0.298c.

Government contribution. 0.135c. per ton mile. Welland Canal traffic, 1912, 2,537,629 tons, of which 51 per cent. was Canadian and 49 per cent. U.S.

On the 51 per cent. of Canadian traffic the Government contribution would amount to 0.265c. per ton mile, as compared with a freight rate of 0.163c. per ton mile. Rail freight, Fort William to Montreal on grain 0.421c. a ton mile.

Water freight, Fort William to Montreal, including interest and maintenance, 0.428c. a ton mile.

It will be seen that the all water rate from Fort William to Montreal, including interest and maintenance of canals would exceed the all rail rate by 0.007c. a ton mile, based on the amount of Canadian traffic passing through the Welland

Canal, but in case tolls were charged to meet these interest and maintenance charges, the U.S. traffic would also have to contribute towards this revenue, and the ton mile charge for the all water route would be reduced to 0.259c. per ton mile.

Government contribution does not include cost and maintenance of harbors, lighthouses, buoys, etc.

The foregoing paper, which was prepared in 1914, was read before the Canadian Society of Civil Engineers in Montreal recently.

Discussion by H. K. Wicksteed.

H. K. Wicksteed, B.A.Sc., M.Can.Soc. C.E., Chief Engineer of Surveys, Mackenzie, Mann & Co., Ltd., Toronto, contributed the following to the written discussion of the paper: I have read with particular interest Mr. Leonard's paper on the economic aspect of canal enlargement and construction; the more so as for a time I was one of the few champions of the Ottawa-French River route. On the whole, I heartily endorse Mr. Leonard's views, and such fault as I have to find with his paper is rather as to his failure to emphasize some of his points. His estimate of the value of waterpower, for instance, to be controlled on the Ottawa is 1,000,000 h.p., which he values in the future at from \$20 to \$100 per h.p. per annum. This power would not be developed by the canal works, it would merely be made susceptible of development. Turbines and power houses, etc., would have to be added to the capital cost, and in an essay of my own on the subject, I was content with the very modest estimate of \$5 per h.p. per annum for the use of the water so controlled and rendered available. This is sufficient to pay 5% on the estimated cost of \$100,000,000. The canal could be made practically free to navigation without imposing any burden on the nation.

But this does not represent the whole of the interest which the public has in the development, by any means. The gathering of the iron ores of Minnesota, and the coal of Ohio, in one spot, which has resulted in the enormous steel production of the United States, was rendered possible by the navigation of the upper lakes; the railways alone could not have accomplished it. The conjunction of cheap power and cheap transport in the Ottawa Valley would inevitably result in industrial development quite impossible under ordinary conditions. There are numerous other natural products which, like iron ore, cannot pay for a long railway journey; and in such products the Laurentian wilderness is very rich; crystalline limestones, phosphates, marbles, graphites, feldspars, etc., etc. The carriage of grain to the sea is not the only useful purpose which our east and west lines of communication are intended to serve.

At the time my last essay was written, no one was thinking of the war, and allusions to what Mr. Leonard terms the strategic aspect of the question, merely provoked a smile. He points out that the enlargement of the St. Lawrence Canals, if feasible, would be carried out and operated within a stone's throw of the International Boundary, and would require a very large force, and probably permanent fortifications, to protect them, but he neglects to mention that it was this very consideration, 100 years ago, which led up to the construction of the Rideau Canal. While we are on terms of perfect amity with our friends to the south, as a nation, we do not consider it unnecessary to guard the Welland Canal,

and the time may come, it may even be close at hand, when an approach to Lake Huron and Lake Michigan and the outlet of Lake Superior may be worth to us many times the \$100,000,000 which he quotes, and which is somewhere about four days' expenditure of Great Britain on the present war. Our present treaty with the United States forbids the maintenance of armed vessels on the Great Lakes except such light armament as is necessary for revenue or police purposes. Consequently in time of trouble any attempt to run even a destroyer or submarine further up the river than Cornwall would be considered a hostile act or casus belli. In the case of the Georgian Bay Canal, on the other hand, no exception could be taken to the mustering of a fleet on Lake Nipissing, which could overrun Lake Huron and blockade the entrances to Lakes Michigan and Superior in 24 hours. We all hope it may be long before such a step is called for, but the mere possibility would be a deterrent to acts of hostility. One of the transcontinental railways is on the edge of boundary waters at a dozen points. Surely it is a matter of some importance to be able to take steps for the protection of such points. Even in these times, when we have ample evidence of the goodwill of the United States as a nation, a raid of Teuton sympathizers organized in the U.S. without the knowledge of the authorities, has not been considered an impossibility.

This is only one aspect of the question, and we will hope an unimportant one, although the events of the last few months have lent to it an importance which it was hard to realize as possible before. The main justification must be in the commerce which it would serve and foster. The people of Canada have decided that an enlarged waterway from the lakes to the ocean is worth a great deal of money, at least the \$100,000,000 of the Georgian Bay estimate, for however the necessity for the enlargement from Prescott to Montreal may have been ignored or kept in the background, there are few who have not realized that the enlargement of the Welland in itself could do little good to anyone or any seaport, except perhaps that of New York.

Like Mr. Leonard, the writer regrets extremely that vast expenditures such as are involved in these public works should have been determined on so largely as matters of local advantage, or as he puts it, "in the spirit of parochial politics," instead of the broad basis of national advantage. If a great artificial highway is to be built at the expense of the nation, it should surely be such a one as will do the nation the most good, and as will be completely within the territory and under the control of that nation; and it is a matter of surprise to the writer that the two communities which should be most vitally interested in the matter, the city of Montreal, and the farmers of the central plains, should have displayed such comparative indifference, and allowed the matter to be decided by Ontario politicians who had little to gain or lose, except while the expenditure was going on.

The arguments adduced against the Georgian Bay route, by some of the Toronto papers, for instance, dealing with sharp curves and high waves on the Georgian Bay, and early morning fogs on the Ottawa, are too unspeakably silly to be repeated; yet the writer was refused publication of a perfectly friendly letter of remonstrance against such childishness. Mr. Leonard's figures as to distances and lockages differ slightly from

the writer's, but are substantially correct. Yet in the face of them it has been claimed that the extra lockage on the Ottawa-Georgian Bay route, and some alleged construction of channel calling for reduction of speed, would offset the difference of 282 miles in distance, or 24 hours' steaming at 12 miles per hour. No one who has taken the slightest pains to study the alternative routes, or even the published reports, could possibly hold such an opinion.

J. S. Armstrong, B.A., M.Can.Soc.C.E., Fredericton, N.B., wrote suggesting that, in view of the subject's importance, the preliminary discussion be printed and discussed the second and third time at intervals of a month or so apart, the discussions to be published from time to time.

Grounding of the s.s. Frankier.

An investigation into the grounding off the Cranberry light, N.S., Dec. 10, 1915, of the s.s. Frankier, owned by Bryce and Galvin, London, Eng., was held at Halifax, N.S., Mar. 2, before Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. John Fleming and D. C. Stuart as nautical assessors. The Frankier, 3,336 tons gross, 2,443 register, sailed from Portland, Me., Dec. 7, with 215,000 bush. of grain. The weather from the time of sailing to the casualty was squally with snow and heavy seas, and no observations for compass adjustment were possible, but the standard compass had no more than 3 deg. deviation, and the vessel was well supplied with all necessary instruments. Yet it transpired that the vessel was navigated with a blue-black chart published in 1906, and without sailing directions. The master stated that he was unable to obtain a 1912 edition in Portland. He is a stranger on the coast, and his log, a cherub, was incorrect, but he did not know to what extent.

The court found that the evidence adduced was of such an extremely contradictory nature as to awaken suspicion, and that the master, John Trattles, in his evidence, made many statements not in accordance with entries in the logs or statements made by other members of the crew. The court wondered at his statement that he failed to secure an up to date chart or sailing directions in Portland, in view of the fact that so many Canadian vessels, and others, sail from that port. He admitted that his log could not be depended on. After steering a number of courses on the morning of the casualty, without keeping count of them as regards time and distance, he laid a course which would bring him about 6 miles from Cranberry light, in a neighborhood full of hidden dangers, and after obtaining a bearing, he deliberately left the bridge, leaving the second officer in charge until he was relieved by the mate, T. George at 4 p.m. He also signed the log, which did not include all the facts, thus showing additional indifference in the navigation of his vessel, and it is noted that certain entries were made and then erased, apparently with some purpose, by some person, whom the court was unable to ascertain. The court stated that while there was nothing to show that the grounding was premeditated, no better methods could have been adopted had it been the intention to lose the vessel. The court noted with interest the master's statement respecting his lack of confidence in the mate, whom he declared to be inefficient, and in view of this the lack of care the master showed

in not remaining on the bridge until the change of watches, and warning the mate to be very careful, and if in doubt, to call him, did not strike the court favorably.

The Frankier was carrying a precious cargo, which, though consigned to a private firm, would eventually have been forwarded to the allies, and being entrusted with this great responsibility, it behoved the master to adopt every precautionary measure to bring his vessel safely to its destination. For these reasons the court considers it a duty to prevent him from having any further responsibility with respect to this vessel on this mission and therefore suspends his certificate for three months from Mar. 3. Respecting the mate's share in the responsibility for the casualty, the court held that the moment he entertained a doubt as to the vessel's position, he should have given the danger he apprehended a wider berth, and communicated his doubts to the master, which would have relieved him from any responsibility. In view of his failing to call the master and meanwhile to adopt means of safety, the court suspended his master's certificate, for two months from Mar. 3. The court decided to retain the scrap log so that it may be forwarded to the British Board of Trade for its information.

Signalling Requirements for British Vessels.

The British Board of Trade's Marine Department has published the following regulations relating to signalling and signalling lamps, Under Regulation 37 of the regulations made under the Defence of the Realm Act, British vessels are required to comply with any orders given, whether by signal or otherwise, by any officer in command of any of His Majesty's ships, or by any naval or military officer engaged in the defence of the coast. Under regulation 37a, which came into effect, Mar. 1, British vessels of 500 tons and upward, must be provided, before going to sea, with suitable hand flags for signalling by the semaphore code, and with an efficient flash lamp for signalling by the Morse code. The lamp shall be of such power and size that the signals made with it may be distinctly visible at a distance of three miles on a dark night in clear weather. In view of these requirements and the penalties for noncompliance, all such vessels should be provided with the necessary lamp and flags, and there should be an officer or seaman on board competent to receive and transmit signals both in the Morse and semaphore codes.

Ice Patrol Service in the North Atlantic.

For the purpose of carrying on the ice observations and ice patrol service provided for by the International Convention for the Safety of Life at Sea, the s.s. Seneca left New York about Feb. 15 and proceeded to the Grand Banks of Newfoundland, to locate ice fields and icebergs, and to make such observations as might be practicable on the quantity of ice, its kind, extent and drift, and to obtain other information. The object is primarily to ascertain the location and progressive movement of the limiting lines of the regions in which icebergs and field ice exists in the vicinity of

Grand Banks, and to disseminate such information for the guidance and warning of navigators. Co-ordinately with these duties, the s.s. Seneca will make such oceanographical and meteorological observations as will contribute toward a knowledge of the causes why the limiting lines assume their observed locations. During the period of ice observations, the Seneca will be the only vessel employed on this duty, but when ice has moved southward so as to make a constant patrol necessary, an additional vessel will be detailed. The experience of previous years has shown that a continuous ice patrol should be established about Apr. 1, and continued throughout the season of dangerous ice conditions. Upon getting in touch with ice, the Seneca will report daily to New York, and endeavors will be made to communicate direct with coast radio stations, but should the Seneca be unable to communicate with any of these stations, the messages will be relayed through any vessel within reach. Endeavors will also be made to keep all vessels at sea advised by daily radio messages of the limits of the ice fields, etc.

Among the Express Companies.

The Canadian Ex. Co. has opened offices at Dugald, Man., and Coleville and Ferintosh, Sask.

The Dominion Ex. Co. has opened offices at Daaquam and English Lake, Que., and Speedwell, Ont.

The Dominion Ex. Co.'s office at Three Rivers, Que., was destroyed by fire, Mar. 20, together with other offices in the Page Block.

W. C. Webb has been appointed chief clerk to Superintendent, Canadian Northern Ex. Co., Winnipeg, vice Z. M. Middleton, whose appointment as agent, C.N.E. Co. at Vancouver, B.C., was announced in a previous issue.

J. R. Stone, who died at St. John, N.B., recently, aged 73, entered express service over 50 years ago as agent for the Eastern Express Co., there. He was later appointed agent for the American and Canadian Ex. Cos. there, and continued in that capacity until 1906, when he retired owing to ill health.

Mrs. V. G. R. Vickers, wife of the Manager Foreign Department, and Superintendent Atlantic Division, Dominion Ex. Co., Montreal, was attacked by a former maidservant, Mar. 17, a revolver shot being fired, but going wide of the mark, the bullet grazing Mrs. Vickers' thumb and burying itself in her clothing.

The Board of Railway Commissioners reserved judgment, Mar. 21, on the application of the Canadian Fisheries Association and the W. J. Guest Fish Co., of Winnipeg, to compel express companies to deliver shipments of fish to dealers' places of business without extra charge. Heretofore the companies have been carrying from coast points at \$3 per 100 lbs., and they desire to add 15c. per 100 lbs. for delivery.

The Canadian Ex. Co.'s receipts and expenditures for Oct. 1915 compared with those for Oct. 1914, were as follows:

	1915.	1914.
Mileage of lines covered	10,238	9,676
Transportation charges	\$351,416	\$280,551
Express privileges, Dr.	165,433	140,379
Operation other than transportation ..	5,612	5,565
Total operating revenue	191,595	145,737
Operating expenses	138,964	131,584
Net operating revenue	52,630	14,152
Express taxes	4,200	4,000
Operating income	48,411	10,152

Telegraph, Telephone and Cable Matters.

The Great North Western Telegraph Co. has deposited plans with the Public Works Department, for the laying of a subaqueous cable in the Cataraqui River, at the lift bridge opening of the Cataraqui bridge, Kingston, Ont.

The Great North Western Telegraph Co. has announced that the cost of cabling money to points in the British Empire has been reduced to the ordinary deferred cable rate. Hitherto such messages were charged at the usual full rate.

The Great North Western Telegraph Co. has opened offices at St. Adelaide de Pabos, Que., Odessa, Ont., and Brunkild, Man., and has closed its offices at Milneke, Que., Cumberland, Harrow and McGregor, Ont. The name of the office at La Tuque, Que., has been changed to Paquet.

In connection with the Dominion Government telegraph line between Ingonish Ferry and Meat Cove, N.S., it was stated in the House of Commons recently that a number of the poles have been erected and that the balance will be as soon as weather permits. The poles specified by the contract are a minimum length of 23 ft., and 5 in. diam. at the small end, and tenders were accepted for these at 90c. each for spruce and 85c. each for fir.

The estimates for the financial year ending Mar. 31, 1917, before the House of Commons, include the following items: half cost of reconstruction of telegraph lines jointly owned by the Anglo-American Telegraph Co. and the Dominion Government, \$17,000; revote; improvements to repair service in Quebec, \$3,000; repairs and improvements to office buildings in Saskatchewan and Alberta, \$3,100; Peace River line, offices and dwellings at Grande Prairie and Dunvegan, \$7,000; revote; general repairs and improvements to mainland telegraph and telephone lines in British Columbia and Vancouver Island, \$25,350; repairs and improvements in Yukon, \$11,350.

Replying to questions in the House of Commons recently, the Minister of Public Works stated that the cable between Magdalen Islands and Bay St. Lawrence, N.S., was laid Sept. 1, 1906, and its operation ceased Dec. 26, 1914, owing to a breakage about 9 miles from the Nova Scotia end. Some attempts were made to repair it but were abandoned owing to bad weather, and to the cable repair steamer Tyrian being laid up for repairs and overhaul. The cable between Bay St. Lawrence and St. Pauls Island, is also not being operated owing to breakage which took place Dec. 23, 1915. Efforts will be made to repair both cables in the spring.

In response to questions in the Saskatchewan Legislature recently, a member of the Government stated that two conferences had taken place between the Government and railway companies operating in the Province, respecting the railway companies allowing the Government to string telephone wires on railway poles in exchange for similar privileges to be granted to the companies, and the subject is being further considered. It was also stated that copper wire had increased 115% in price since the commencement of the war, and that the construction of telephone lines had increased about 40% in the same period. The Government has not decided what lines, if any, it will erect during this year.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Eastern Car Co., Ltd., New Glasgow, N.S., has appointed E. E. Forgeus as Purchasing Agent.

Fabrikoid Car Curtains.—The Wilmington and Philadelphia Traction Co., Wilmington, Del., is using curtains made of Fabrikoid, manufactured by the Du Pont Fabrikoid Co., on 31 new cars which are being put in use.

Chicago Car Heating Company.—Frank A. Purdy, Canadian Gold Car Heating & Lighting Co., has been appointed Canadian Manager, Chicago Car Heating Co., with office at Montreal. A. D. Bruce, Canadian Agent, Chicago Car Heating Co., Montreal, continues in the same position as heretofore.

The Franklin Railway Supply Co. announces that, due to the results secured by the use of the Stone-Franklin lighting equipment, it has appointed Ralph G. Coburn, Sales Manager of its electrical department. He has been associated with the Franklin Company for the past seven years, being formerly in charge of the Chicago office and for the last few years Eastern Sales Manager, with headquarters in New York, where he will continue in his new capacity.

Dominion Steel Corporation.—D. H. McDougall has been appointed General Manager at Sydney, N.S. He is 36 years old and during the company's construction period was on its engineering staff. Subsequently he spent two years in studying mining and steel work engineering in the United States and was for a time employed in the New York Central Rd's, Engineering Department. He returned to Nova Scotia to become Superintendent of the Steel Corporation's iron ore mining operations.

Franklin Railway Supply Co.—Joel S. Coffin, who has been President since the company's incorporation in 1901, has been elected Chairman of the Board, and S. G. Allen, who has been Vice President for the same period, has been elected President. Mr. Allen was born at Warren, Pa., in 1870 and was educated there and at Pennsylvania State College. He entered business life immediately after leaving college and found time to study law during a period of intense business activity. He was admitted to the Bar in Warren County, Pa., and practised law for 9 years.

Canadian Locomotive Co. Ltd.—At a meeting of directors at Kingston, Ont. Mar. 11, A. W. Wheatley, who has been elected President of the Lima Locomotive Corporation, Lima, Ohio, resigned as Vice President and General Manager, but remains a director. F. G. Wallace, formerly of Pittsburg, Pa., and latterly of Kingston, who has been a director for some years, was appointed General Manager; J. J. Harty, previously Secretary, was elected a director and appointed Vice President and Sales Manager; Wm. Casey, previously Assistant to Vice President and General Manager, was appointed Manager, and J. H. Birkett, formerly Treasurer, was appointed Secretary-Treasurer.

Transportation Conventions in 1916.

May.—International Railway Fuel Association, Chicago, Ill.
May, 2-5.—Air Brake Association, Atlanta, Ga.
May 15-18.—International Railway Fuel Association, Chicago, Ill.
May 17.—Freight Claim Association, Washington, D.C.
May 17.—Association of Railway Claim Agents, Atlantic City, N.J.
May 23-26.—Master Boiler Makers' Association, Cleveland, Ohio.
June 14-17.—Master Car Builders' Association, Atlantic City, N.J.
June 19-22.—American Railway Master Mechanics' Association, Atlantic City, N.J.
June 20.—Train Despatchers' Association of America, Toronto, Ont.
June 20-22.—Association of Railway Telegraph Superintendents, St. Paul, Minn.
June 20-23.—American Association of Freight Agents, Cincinnati, Ohio.
June 21.—Train Despatchers' Association of America, Toronto.
June 21.—American Association of General Baggage Agents, Boston, Mass.
June 27.—American Society for Testing Materials, Atlantic City, N.J.
June 27-28.—Association of Transportation and Car Accounting Officers, Boston, Mass.
June 28.—Association of American Railway Accounting Officers, Detroit, Mich.
July.—International Railway General Foremen's Association.
August.—International Railroad Blacksmiths' Association, Chicago, Ill.
August 29.—International Railway General Foremen's Association, Chicago, Ill.
September 12-14.—Master Car and Locomotive Painters' Association of United States and Canada, Wilmington, Del.
September.—Railway Signal Association, Mackinac Island, Mich.
September 19-22.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
October.—Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.
October 3-5.—Railway Fire Protection Association, New York.
October 17-19.—American Railway Bridge and Building Association, New Orleans, La.
October 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Philadelphia, Pa.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated:

Canadian Car Service Bureau—J. Reilly, Manager, 401 St. Nicholas Building, Montreal.
Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.
Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.
Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.
Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.
Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.
Canadian Ticket Agents' Associations—E. de la Hooke, London, Ont.
Dominion Marine Association—F. King, Counsel, Kingston, Ont.
Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.
Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.
Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.
Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.
Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.
Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.
International Water Lines Passenger Association—M. R. Nelson, New York.
Niagara Frontier Summer Rate Committee—James Morrison, Montreal.
Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.
Quebec Transportation Club—A. F. Dion, Quebec.
Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.
Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.
Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.
Western Canada Railway Club—Louis Kon, Box 1707 Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.
Winnipeg Traffic Club—James Gehrey, Bannatyne Avenue, Winnipeg, Man.

The Annual Report of the Winnipeg Electric Railway Company and Subsidiary Companies

For the Fiscal Year ended Thirty-first of December, Nineteen Hundred and Fifteen. Submitted at the Twenty-third Annual Meeting, Held on the Twenty-third Day of February, Nineteen-sixteen.

DIRECTORS:

SIR WM. MACKENZIE.....	President	Sir W. C. Van Horne	
A. M. NANTON.....	Vice President	D. B. Hanna	G. V. Hastings
F. MORTON MORSE.....	Sec. Treasurer	Hugh Sutherland	R. J. Mackenzie
Manager: WILFORD PHILLIPS			

Report of the President and Directors

For the Year Ended Dec. 31, 1915.

To the Shareholders—

Your Directors beg leave to submit a statement of the operations of your properties for the year ended December 31st, 1915, together with a Consolidated General Balance Sheet of the parent and subsidiary Companies and a Consolidated Income Account.

The net earnings from the operations of the combined properties amounted to \$1,331,737.28, in comparison with \$1,769,114.51 for the previous year. Of this amount, the fixed charges, including taxes, city percentages, car licenses, interest on the funded debt and other contingent charges, absorbed \$835,635.45. The surplus earnings for the year were \$496,101.83, which, when added to the surplus brought forward from the previous year, as adjusted, aggregate \$1,637,598.55.

Quarterly dividends were declared and paid by your Directors at an average rate of 9½ per cent. per annum, amounting to \$855,000.00.

The decrease in earnings was due to the general depression following the first winter of the war, coupled with the advent of the jitneys in the spring. The duration of the depression from both causes was temporary. The excellent crop prospects of the West, followed by an enormous yield, had a stimulating effect upon the business of the Company and caused a gradual advance toward normal conditions.

Your Directors are therefore pleased to be able to report that the net earnings for the months of November, December and January compare favorably with a similar period of previous years.

In order to verify the value of the physical properties of the Company as shown by the books, and to reclassify the capital expenditures to bring them into conformity with the classification prescribed by the Public Utilities Commissioner, your Directors are having the properties of the Company appraised by the J. G. White Engineering Corporation of New York. The appraised value of the properties, which is expected will exceed the book values, will be substituted for the book values shown in the Balance Sheet, when ascertained.

Further economies in the operation of your properties are in contemplation and your Directors confidently anticipate an increase in net earnings during the ensuing year.

During the year, in accordance with the orders of the Public Utilities Commissioner, changes in the system of accounting have been effected with the view of introducing a classification of accounts prescribed by the Commissioner. For this reason it is found impracticable to submit comparisons between operating figures of the current year and

the previous year, as adjustments in the figures of 1915 have been made to conform with the new classification.

Respectfully submitted,

WM. MACKENZIE, President.

Auditors' Report

To the Shareholders, Winnipeg Electric Railway Company, Winnipeg, Canada.

We have audited the accounts of the Winnipeg Electric Railway Company and its Subsidiary Companies for the year ended December 31, 1915, and have compared them with the accompanying consolidated Balance Sheet and Income Account, which are in accordance with the books.

The Balance Sheet and relative Income Account, in our opinion, correctly reflect the financial condition of the combined Companies, as at December 31, 1915, and the result of their operations for the year ended on that date.

The Directors report that, as in past years, the properties have been fully maintained. An appraisal of the physical properties is being made by The J. G. White Engineering Corporation of New York, and their valuation will be substituted for the book values which have been adopted in the accompanying statements.

MARWICK, MITCHELL, PEAT & CO.,
Chartered Accountants.

Winnipeg, February 8, 1916.

Winnipeg Electric Railway Company and Subsidiary Companies

Consolidated General Balance Sheet as at December 31, 1915

ASSETS	
Physical Properties at book values	\$24,956,030.52
Current Assets:	
Cash in Bank and on Hand....	\$ 52,824.55
Cash in Bank—Special Account	129,623.63
Notes Receivable.....	3,476.06
Consumers' and other Accounts Receivable.	179,671.67
Materials and Supplies.....	202,367.08
	567,962.99
Prepaid and Deferred Charges...	39,156.93
Note—A liability exists in respect of deferred annual instalments of Pavement Taxes, amounting to \$1,089,586.84, payable 1916-1934.	
Total.	\$25,563,150.44

LIABILITIES

Capital Stock:	
Authorized:	
100,000 Shares Common	
Stock of \$100.00 each...	\$10,000,000.00
Issued:	
90,000 Shares Common Stock	
of \$100.00 each.....	9,000,000.00
Debenture Stock:	
£900,000 4½% Perpetual Con-	
solidated (Total Issue £1,-	
300,000).....	4,380,000.00
Note—£400,000 is pledged with	
Trustees to secure 6% Gold	
Notes in amount of \$1,500,-	
000.00.	
Minority Stockholders' Interests	
in Capital and Surplus of	
Winnipeg, Selkirk and Lake	
Winnipeg Railway Company.	10,495.72
Funded Debt:	
Winnipeg Electric Railway	
Company.....	\$6,500,000.00
Subsidiary Companies	1,130,700.00
	7,630,700.00
Current and Accrued Liabilities:	
Notes Payable to Bankers,	
partly secured by underlying	
Bonds.....	1,685,000.00
Other Notes Payable.....	50,000.00
Accounts Payable.....	69,042.18
City Percentage and Car	
License	99,303.38
Wages Payable.....	57,005.73
Consumers' Security Deposits	
40,578.75	
Unredeemed Tickets.....	18,440.24
Other Liabilities.....	78,285.02
Accrued Interest Charges, etc.	
111,010.92	
Bond Interest (Payable Jan. 1,	
1916)	125,000.00
Dividend (Payable Jan. 10,	
1916)	180,000.00
	2,513,666.22
Reserve for Injuries and Dam-	
ages, Etc.	245,689.95
Reserve.	1,000,000.00
Surplus.	782,598.55
Total.	\$25,563,150.44

Winnipeg Electric Railway Company and Subsidiary Companies

Consolidated Income Account for the Year Ended December 31, 1915.

Operating Revenue for Year Avail-	
able to meet Fixed Charges and	
Dividends.	\$1,331,737.28
Fixed Charges:	
Interest Charges on Debenture	
Stock, Bonds, Gold Notes, etc. \$637,263.35	
City Percentage and Car License	
99,303.38	
Taxes.	99,068.72
	835,635.45
Net Income.....	\$ 496,101.83
Surplus brought forward from	
1914, as adjusted.....	\$1,141,496.72
Net Income for Year.....	496,101.83
	\$1,637,598.55
Dividends at the rate of 9½%, paid	
quarterly.	855,000.00
Surplus Carried Forward.....	\$ 782,598.55

Winnipeg Electric Railway Company and Subsidiary Companies

Funded Debt, as at December 31, 1915.

Winnipeg Electric Railway Company:	
5% First Mortgage Bonds,	
Winnipeg Electric Street	
Railway Company, redeem-	
able January 1, 1927.....	\$1,000,000.00
First Refunding Mortgage 30	
Year 5% Sinking Fund Gold	
Bonds, redeemable January 1,	
1935.	\$5,000,000.00
Less held in escrow to redeem	
Winnipeg Electric Street	
Railway Company Bonds....	1,000,000.00
	4,000,000.00
Gold Notes 6%, Secured by £400,-	
000 Debenture Stock:	\$5,000,000.00
Due January 15, 1916.....	\$ 750,000.00
Due January 15, 1917.....	750,000.00
	1,500,000.00
Winnipeg, Selkirk and Lake Win-	
nipeg Railway Company (Guar-	
anteed by Winnipeg Electric	
Railway Company):	
5% First Mortgage Gold	
Bonds, redeemable July 2,	
1933.	\$ 400,000.00
5% Ten Year	
General Mort-	
gage and Re-	
funding Bonds,	
redeemable	
July 1, 1925..	\$1,400,000.00
Less held in	
escrow to re-	
deem 5% First	
Mortgage Gold	
Bonds.	400,000.00 1,000,000.00
	\$1,400,000.00
Outstanding:	
5% First Mortgage Gold	
Bonds.	\$ 97,500.00
5% Ten Year General Mort-	
gage and Refunding Bonds	533,200.00
	630,700.00
Note—Bonds in the amount of	
\$769,300.00 are pledged as	
collateral security for loans	
to the Winnipeg Electric	
Railway Company.	
Suburban Rapid Transit Com-	
pany (Guaranteed by Winnipeg	
Electric Railway Company):	
First Mortgage 30 Year 5%	
Gold Bonds, redeemable	
January 31, 1938.....	500,000.00
Total.	\$7,630,700.00

Stock Ownership

As at December 31, 1915.

Company	Authorized	Issued	Owned
Winnipeg, Selkirk and			
Lake Winnipeg Rail-			
way Company.....	\$ 500,000.00	\$500,000.00	\$490,000.00
Suburban Rapid Tran-			
sit Company.....	100,000.00	100,000.00	100,000.00
Winnipeg River Power			
Company, Limited..	1,000,000.00	100,900.00	100,900.00
Winnipeg River Rail-			
way Company.....	50,000.00	10,000.00	10,000.00

Hotel Dennis

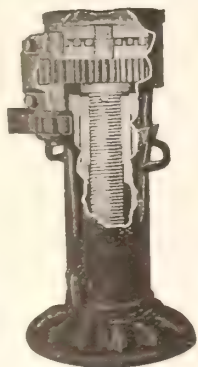
ATLANTIC CITY, N.J.

An American Plan Hotel that for the past fifteen years has been under the same management and developed on lines that appeal to people of refined taste.

It has a superior location. It is thoroughly modern. It is a recognized standard of excellence.

Capacity 600.

WALTER J. BUZBY



Showing the construction of our geared jacks.

Celebrated "H & E" Lifting Jack

Our Patent Ball-Bearing Geared Jacks are Ideal in Railroad and Heavy Construction Work.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

SHERBROOKE, QUE.

Sole Agents for Brakeshoes for Canada outside of B.C., Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for B.C., The B.C. Equipment Co., Vancouver, B.C. Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.

High Grade Electric
STEEL CASTINGS
MANGANESE STEEL
For Crusher Jaws and Heavy
Wear Parts

RONZE

M.C.B. Standard Journal Bearings and Engine Bearings

Improved Reinforced Steel-Backed

BRAKESHOES

Locomotive Driver and Truck Shoes. Freight and Passenger Car and Electric Car Shoes.

Consolidated

600 volt—Switches—1800 volt

ARE
MECHANICALLY AND ELECTRICALLY
CORRECT

Write us for further information.

Consolidated Car-Heating Co.

New York — Albany — Chicago

DAWSON & CO., AGENTS
148 McGill Street, MONTREAL, QUEBEC.

Insist on having

DREWRY'S American STYLE RICE BEER

The best beer—
without exception

E. L. Drewry, Ltd., Winnipeg

THE GRAND TRUNK RAILWAY COMPANY OF CANADA.

Notice is hereby given that the Ordinary General Meeting of the Grand Trunk Railway Company of Canada will be held at the Cannon Street Hotel, Cannon Street, London, E.C., on Tuesday, the 18th April, 1916, at 12 o'clock noon precisely, for the purpose of receiving a report from the directors, for the election of directors and auditors, and for the transaction of other business of the company.

Notice is also given that the Transfer Books of the company, except so far as regards the Transfer Books of the perpetual four per cent Consolidated Debenture Stock, will be closed from Wednesday, 29th March, to the day of meeting, both days inclusive.

By order,

ALFRED W. SMITHERS,
Chairman.

H. H. NORMAN, Secretary.

Dashwood House, 9 New Broad Street,
London, E.C. 21st March, 1914.

NOTICE.

C. F. Buchanan, of the United States of America, the owner of the exclusive rights to Canadian patent no. 153287, issued to J. B. Cox, and covering improvements in Smoke Jacks, wishes to advise that all possible users of Smoke Jacks covered by this patent can obtain them within reasonable time for use on any railway in the Dominion of Canada.

All enquiries regarding the above should be addressed to C. F. Buchanan, c-o Coleman Fare Box Co., Ltd., 70 Bond Street, Toronto, Ontario, Canada.

Complete Hydraulic Equipment

For Railway and Shipbuilding Plants

Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc. Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast Iron Pipe, Hydrants, Valves and Fittings, etc.

R. D. WOOD & CO. Philadelphia, Pa.

Car Closets

Flush or Dry

DUNER CO.

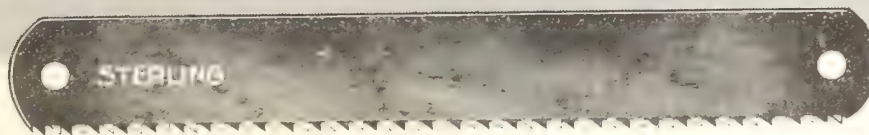
101 S. CLINTON ST.
CHICAGO

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Celebrated Wheel Truing Brake Shoe. Best Wheel Grinders in the World.

HACK⁶⁶ "STERLING" SAWS⁹⁹



Will prove an economical investment and should be used in every machine shop. Made in different gauges and pitches to suit all kinds of work. If you are not already a user of "Sterling" Blades—give them a trial.

Manufactured by

Diamond Saw & Stamping Works, Buffalo, N.Y., U.S.A.

The Parmelee Pipe Wrench



Price List C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	3/8, 1/2, 3/4, 1 in.	\$5.00	\$2.25	3/8, 1/2, 3/4, 1 in. \$.75
20 in.	2 1/2	1, 1 1/4, 1 1/2, 2 in.	7.50	2.50	{ 3/4, 1, 1 1/4 in. 1.00 1 1/2, 2 in. 1.25
25 in.	3 1/2	1 1/2, 2, 2 1/2, 3 in.	7.50	3.00	1 1/2, 2, 2 1/2, 3 in. 1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Limited
Toronto, Canada

"The Toothless Wonder"

Designed Especially to handle pipes spaced closely as in coil work. No. 2 1/2 wrench illustrated requires but three-quarter inch space between pipes.

Positive Grip instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

Ratchet-like Action. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

Can't Chew. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

Can't Crush. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.

Dominion Iron & Steel Co., Limited

Manufacturers of

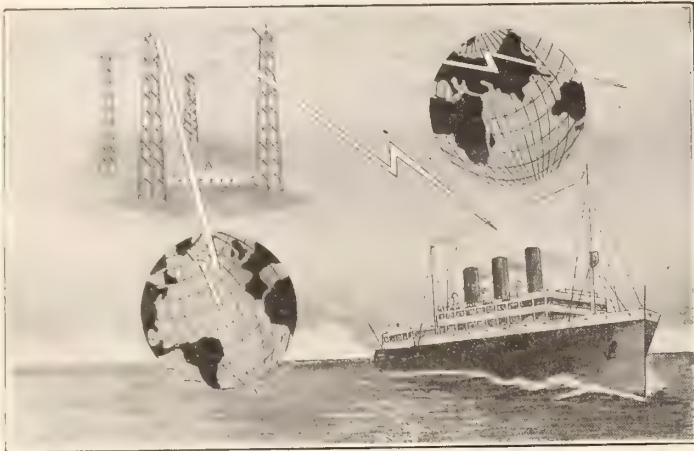
Basic Open Hearth Steel Rails

We will be pleased to have your enquiries for 1916 shipments

Head Offices
and Works

Sydney, Cape Breton, Canada

"Marconi" Wireless Telegraph Apparatus



THE WORLD WIDE WIRELESS

We supply installations on Land, Ship, Railway and Aeroplane. Sets range from 50 to 2,000 miles.

Demonstrated

That Merchant and Pleasure Craft cannot afford to be without a MARCONI EQUIPMENT. Every passenger steamer worth the name is now equipped with Marconi Wireless. Over 2,000 vessels now equipped.

Canadian Marconi Company

137 McGill Street, MONTREAL



Which Method

prevails in your plant? Does it take two men to do one man's work.

Why don't you replace that old antiquated tool with a new up to date

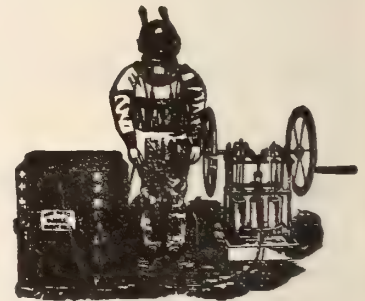
Reece's New Screw Plate

These pictures do not exaggerate conditions as you can actually see them, if you will visit Machine Shops throughout the country.

Lessen your cost by giving your mechanics a REECE'S NEW SCREW PLATE.

Butterfield & Co., Inc.

Rock Island, Que,



JOHN DATE

Manufacturer of

Diving Apparatus

For Sale or Hire

Brass Founder and Coppersmith

13-15 Concord St., Montreal



Capital Authorized.....\$10,000,000
Capital Paid up.....7,000,000
Reserve Fund.....7,000,000

Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the World.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.

NICKEL SHOT—HIGH AND LOW CARBON INGOTS—TWO SIZES, 25-LB., 50-LB.

Electrolytic Nickel—99-80 p.c.

Prime Metals for the manufacture of Nickel Steel, German Silver, Anodes, and all remelting purposes. Our Nickel is produced as rods, sheets, strip stock, wire, and tubes.

METAL

We are Sole Producers of this natural stronger than steel, non-corrodible alloy. Manufactured forms are rods, flats, castings, tubes, sheets, strip stock and wire. Ask for descriptive booklet.

Send Inquiries direct to us.

The International Nickel Company, 43 Exchange Place, New York

NOTICE.

The General Railway Signal Company of the United States of America, the owner of the exclusive rights to Canadian patents No. 92323, No. 93127, No. 96256, and No. 97758, issued to Young and Townsend, and covering methods of signaling electrified railways, wishes to call the attention of all possible users of the devices and systems covered by such patents to the fact that it is prepared to sell and furnish, at short notice, all such devices and to install such systems upon any railway in the Dominion of Canada.

All inquiries regarding the above should be addressed to The General Railway Signal Company of Canada, Limited, Lachine, Province of Quebec, Canada.

ENAMELED IRON SIGNS

The ideal signs for
Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.

We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc,

Guaranteed not to
fade or be affected
by the weather in
any way.

Acton Burrows
Limited

Enameled Iron Signs

70 Bond Street - Toronto

We Sell "Automatic" Car Ventilators

"Intake-and-Exhaust" and "Exhaust" types. Write for "Car Ventilation" booklet.

"Flower" Brush Holders

For all standard G. E. and Westinghouse motors; also Bushed Controller and Air Handles, D-Shaped, Steel Tubing, etc.

"Universal" Trolley Wheels and Harps

"Avco" Ball-and-Socket Strap Hangers
The kind that prevent strap breakage and save law-suits.

Automatic Ventilator Company

2 Rector Street

New York, N.Y.

Dominion Bridge Company, Limited

Head Office and Works,
MONTREAL, P.Q.

Branch Offices and Works,
TORONTO, OTTAWA and WINNIPEG



Lachine Bridge

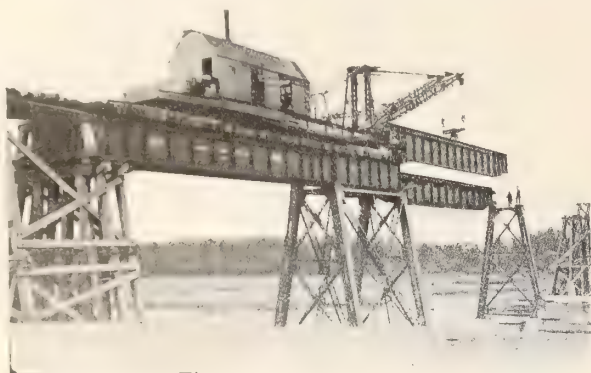
Engineers, Manufacturers and Erectors of Steel Structures.
CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

Large Stock of Standard Structural Material at all Works.

"BEATTY" HOISTS

For situation where the work is severe and the service exacting—"a Beatty always fills the bill"



Derrick car engaged with an 8 x 12 four drum Beatty Hoist placing an 80 foot deck plate girder span in Skugog River Bridge.

Let us know your requirements for
Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

We will gladly send full information.

M. Beatty & Sons Limited - Welland

Toronto Office—Goodyear Bldg. Telephone Adelaide 208.

Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg, Winnipeg.

Hunt-Spiller Gun Iron

IN

Locomotive Castings

SAVES MONEY

INCREASES: Engine Efficiency—Engine Mileage.
DECREASES: Engine Failures—Engine Repairs.

MADE ONLY BY

Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.

J. G. Platt,
Sales Manager.

Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.



STANDARD Signal Wires

include a complete line of high grade products among which are

Copper Wire

C.C.C. Wire
(Colonial Copper Clad)

Bronze Wire
High Strength

We can supply them bare or insulated with weatherproof braid or rubber.

Write our nearest office.

Standard
Underground
Cable Co. of
Canada,
Limited

Hamilton, Ont.

Montreal, Que.

Winnipeg, Man.

Seattle, Wash.

ESTABLISHED 1849.

BRADSTREET'S

Capital and Surplus, \$1,500,000.
Offices throughout the Civilized World.

Executive Offices:

NOS. 346 and 348 BROADWAY,
N.Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA:

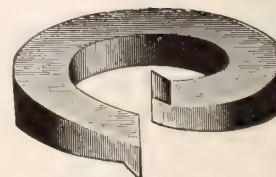
Halifax, N.S.; Hamilton, Ont.; London, Ont.;
Montreal, Que.; Ottawa, Ont.; Quebec, Que.;
St. John N.B.; Toronto, Ont.; Vancouver, B.C.;
Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.;
Victoria, B.C.

THOS. C. IRVING,

Gen. Man. Western Canada, Toronto.

The Positive Lock Washer

is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks

The Positive Lock Washer Co.
Sole Mfrs., Newark, N.J.

F. H. HOPKINS & CO.,

Agents, Montreal

Engineers and Contractors**THE ARNOLD COMPANY**

ENGINEERS—CONSTRUCTORS.
ELECTRICAL—CIVIL—MECHANICAL
REPORTS, DESIGN AND CONSTRUCTION
Complete Railway Shop and Terminal Properties—
Electrification of Steam Railroads.
OUR EXPERIENCE COVERS THIRTY-FIVE PLANTS
Chicago, Illinois.

JACOBS & DAVIES, Inc.
Consulting Engineers

MONTREAL LONDON NEW YORK
Foundations, Subaqueous and Land Tunnels, Sub-
ways, Railways, Harbours, Waterpower Develop-
ment, Examinations, Reports.
Montreal Office: Eastern Townships Bank Building

ANGUS SINCLAIR, C.E.*Railway Contractor*

Office: Imperial Bank Building,
King and Sherbourne Sts., Toronto.

Locomotive COALING STATIONS

ROBERTS AND SCHAEFER CO.
ENGINEERS AND CONTRACTORS
CHICAGO, U.S.A.

The Terry & Tench Co., Inc.

Bridge Builders, Manufacturers of Derricks, Erec-
tion Plant and Shipyard Cranes, Contractors, Struc-
tural Steel, Erection.

Grand Central Terminal, Room 5717,
New York, N.Y.

Patent Solicitors**ROSS THOMSON & CO.**

MECHANICAL AND ELECTRICAL ENGINEERS,
PATENT ATTORNEYS.

Send for free book Patent Protection.

HOPE CHAMBERS - - OTTAWA, ONT.

PATENTS**HERBERT J. S. DENNISON**

Mechanical Engineer, Patent Attorney and Expert.
Patents, Trade Marks, Designs, Copyrights, and
Infringements. 20 Years experience in Patents
and Practical Engineering.

Star Building, 18 King Street West, Toronto
WRITE FOR BOOKLET.

PATENTS SECURED OR OUR FEES RETURNED.

Being next door to the Patent Office; we have per-
sonal interviews with Examiners, thus earlier allow-
ance of your Patents. We have access to all Records
and solicit the business of Manufacturers, Engineers
and others who realize the advisability of having
their Patent business transacted by Experts.

HAROLD C. SHIPMAN & CO.
Reg. Patent Attorneys. Ottawa, Canada

VAN-HALLEN & O'NEIL

REGISTERED ATTORNEYS

at Washington and Solicitors of Canadian and
Foreign Patents, Copyrights, Trade Marks,
Searches.

Head Office, 103 Farmer Building, 333 Main Street,
WINNIPEG, MAN., Canada

FOR TICKET CASES AND COMMERCIAL FURNITURE

of all descriptions to stock
or special design, apply to

The Canadian Office and School Furniture Co.,
Limited
Preston - Ontario

The Ottawa Car**Manufacturing Co., Limited**

Builders of

Electric Cars, Snow
Sweepers and Plows

Also

Producers of Brass
Castings of Every
Description.

Slater Street - Ottawa

**Rails, Cars,
Locomotives**

and Contractors' Equipment

IMMEDIATE
SHIPMENT

John J. Gartshore

58 Front St. West
TORONTO

ROBERT W. HUNT
THOS. C. IRVING, JR.

CHARLES WARNOCK
JAS. W. MOFFAT

Robert W. Hunt & Co., Limited

Consulting and Inspecting Engineers
Chemists and Metallurgists

Expert examination and tests of all steel and metal products;
Bridges, Buildings, Cement; Electrical and Mechanical Plant
Equipment; Rails and Fastenings; Cars; Locomotives; Pipe;
Castings; Forgings; Lumber; Paving Materials.

Resident inspectors at all important manufacturing centres in
Canada, the United States and Great Britain.

REPORTS ON PROPERTIES AND PROCESSES.

Head Office and Laboratories:

McGill Building, - - - MONTREAL, QUE.

Branches: TORONTO VANCOUVER LONDON, ENGLAND

The Preston Car & Coach Co., Limited

Preston, Ont.

Manufacturers of

Steam and Electric
Railway Cars and
Special Cars.

**Sessions-Standard
Friction Draft Gear**

Simplest and Best

Both
Made by

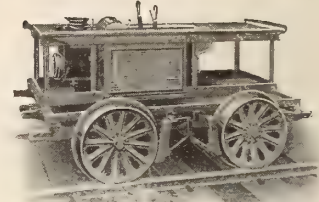
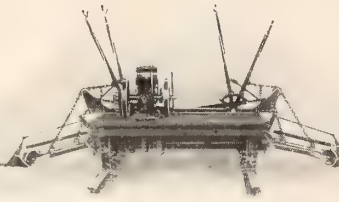
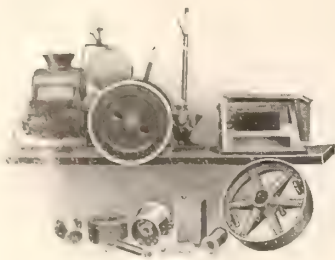
Standard Coupler Co.

30 CHURCH STREET, NEW YORK

**Standard Steel
Platforms**

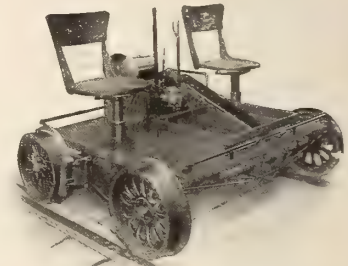
Used by all Canadian Railways

FAIRMONT WINS GOLD MEDAL



The excellence of FAIRMONT Railway Motor Cars is attested by their receiving the highest competitive award, a gold medal, at the Panama-Pacific International Exposition, San Francisco.

Years of good service on Canadian railroads has proven the justice of this award. When you need a motor car, specify "FAIRMONT". Instalment terms to private buyers.



FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

Formerly Fairmont Machine Co.

445 N. MAIN ST., FAIRMONT, MINNESOTA, U.S.A.

KINNEAR

FOR

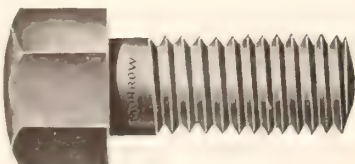
PIER SHEDS-FREIGHT HOUSES-ROUND HOUSES & SHOPS

**THE KINNEAR MFG. CO.
COLUMBUS, OHIO. U. S. A.**

CANADIAN REPRESENTATIVES

EASTERN & CENTRAL
MUSSENS LTD. MONTREAL

BRITISH COLUMBIA
WM. N. O'NEIL & CO. VANCOUVER



If you want the best Set and Cap Screws made, insist on having "MORROW'S"

**John Morrow Screw & Nut Company,
Limited.**
INGERSOLL - - - ONTARIO

It Pays to carry an advertisement in the Canadian Railway and Marine World every issue of the year because you obtain proportionately better **Results**

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies.

ACETYLENE

Commercial Acetylene Ry., Lt. & Sig. Co.

AERATED WATERS

E. L. Drewry

AIR BRAKES AND FITTINGS

Canadian Westinghouse Co.

ALLES

E. L. Drewry

ANGLE BARS

Steel Co. of Canada

AUTOMOBILES

Preston Car & Coach Co.

AXLES

Nova Scotia Steel and Coal Co.

Jas. W. Pyke & Co.

Steel Co. of Canada.

BATTERIES, DRY

Canadian National Carbon Co.

BATTERIES, SIGNAL

Canadian National Carbon Co.

BATTERIES, STORAGE

Canadian National Carbon Co.

BATTERIES, TRACK

Canadian National Carbon Co.

BATTERY SUPPLIES

Canadian National Carbon Co.

BEACONS

Safety Car Htg. & Ltg. Co.

BOILER COMPOUND

Dearborn Chemical Co. of Canada

BOILERS

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

BOILERS, PORTABLE

F. H. Hopkins & Co.

Polson Iron Works

BOILERS, STATIONARY AND MARINE

Polson Iron Works

BOILERS, STEAM

Polson Iron Works

BOILERS, WATER TUBE

Babcock & Wilcox

Polson Iron Works

BOLTS AND NUTS

Steel Co. of Canada

BOLTS, TRACK

F. H. Hopkins & Co.

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

BORERS, CAR WHEEL

John Bertram & Sons Co.

BRAKE BEAMS

Buffalo Brake Beam Co.

BRAKE SHOES

Canada Iron Foundries

Canadian Brakeshoe Co.

Dominion Brakeshoe Co.

BRAKE SHOES, LOCOMOTIVE DRIVER

Canada Iron Foundries

Bridge Builders

Terry & Tench Co.

BRIDGE NUMBERS

Acton Burrows, Limited

BRIDGES

Canadian Bridge Co.

Dominion Bridge Co.

BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION

Canadian National Carbon Co.

BUCKETS, COAL, ORE AND CONCRETE

M. Beatty & Sons

Brown Hoisting Machinery Co.

F. H. Hopkins & Co.

BUILDINGS, STEEL

Canadian Bridge Co.

Dominion Bridge Co.

BUMPING POSTS

F. H. Hopkins & Co.

CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED

Standard Und. Cable Co. of Can.

CARBONS, ARC LAMP, FLARE ARC AND PHOTOGRAPHIC

Canadian National Carbon Co.

CARBON SPECIALTIES

Canadian National Carbon Co.

CAR SIGNAL SYSTEMS

Ohio Brass Co.

CARS

Crossen Car Co.

J. T. Gardner

Hart-Otis Car Co.

National Steel Car Co.

Ottawa Car Mfg. Co.

Preston Car & Coach Co.

CASTINGS

Crossen Car Co.

CASTINGS, BRASS

Canada Iron Foundries

Canadian Bronze, Limited

CASTINGS, CAR

Canada Iron Foundries

Dominion Brakeshoe Co.

CASTINGS, IRON

Canada Iron Foundries

Hunt-Spiller Manufacturing Corp.

CASTINGS, IRON AND STEEL

Dominion Brakeshoe Co.

Dominion Steel Foundry Co.

CASTINGS, MALLEABLE

Taylor & Arnold

CASTINGS, MANGANESE STEEL

Canadian Steel Foundries, Ltd.

CASTINGS, STEEL

Dominion Steel Foundry

CATERINARY MATERIALS

Ohio Brass Co.

CHAINS

B. J. Coghlin Co.

F. H. Hopkins & Co.

CLOSETS, CAR

Duner Co.

COAL

Nova Scotia Steel and Coal Co.

COAL CHUTES

Roberts & Schaefer Co.

COAL DOCK BRIDGES

Roberts & Schaefer Co.

COAL MINING AND WASHING PLANTS

Roberts & Schaefer Co.

COALING STATIONS

Roberts & Schaefer Co.

COMPRESSORS, AIR

F. H. Hopkins & Co.

CONCRETE MIXERS & ROCK CRUSHERS

F. H. Hopkins & Co.

CONTRACTORS' SUPPLIES

F. H. Hopkins & Co.

Rice Lewis & Sons

CONVEYORS, COAL AND ASH

Babcock & Wilcox

COPPER, RODS AND WIRE

Standard Und. Cable Co. of Can.

COUPLERS, CAR & LOCOMOTIVE

Canadian Steel Foundries, Ltd.

Ohio Brass Co.

Taylor & Arnold

CRANES

Brown Hoisting Machinery Co.

F. H. Hopkins & Co.

CRANES, WRECKING

F. H. Hopkins & Co.

CRANES, ELECTRIC

Babcock & Wilcox

Dominion Bridge Co.

F. H. Hopkins & Co.

CRANES, TRAVELING

F. H. Hopkins & Co.

CROWBARS

B. J. Coghlin Co.

CULVERTS

Pedlar People, Ltd.

CURTAINS AND FIXTURES, CAR

Du Pont Fabrikoid Co.

Preston Car & Coach Co.

CUTS

Acton Burrows, Limited

DERRICKS

M. Beatty & Sons

F. H. Hopkins & Co.

DIES

Butterfield & Co.

DITCHERS

M. Beatty & Sons

F. H. Hopkins & Co.

DIVING OUTFITS

John Date

F. H. Hopkins & Co.

DOORS, STEEL ROLLING

Kinnear Manufacturing Co.

DOOR SIGNS

Acton Burrows, Limited

DRAFT GEAR

Standard Coupler Co.

DREDGES

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

DRILLS

John Morrow Screw & Nut Co.

DRILLS, AIR

F. H. Hopkins & Co.

Independent Pneumatic Tool Co.

DRILLS, WELL

F. H. Hopkins & Co.

DUMP CARS, CONTRACTORS'

Hart-Otis Car Co.

F. H. Hopkins & Co.

DYNAMO AND ELECTRIC CASTINGS

Dominion Brakeshoe Co.

ECONOMIZERS

Babcock & Wilcox

ELECTRIC CAR ROUTE SIGNS

Acton Burrows, Limited

Preston Car & Coach Co.

ENAMELED IRON SIGNS

Acton Burrows, Limited

ENGINEERS

Arnold Co.

Jacobs & Davies

Roberts & Schaefer Co.

Angus Sinclair & Co.

ENGINES, AUTOMATIC

Polson Iron Works

ENGINES, HOISTING

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

ENGINES, STATIONARY AND MARINE

Polson Iron Works

ENGINES, STEAM

F. H. Hopkins & Co.

EXPRESS OFFICE SIGNS

Acton Burrows, Limited

FARE BOX HOLDERS

Coleman Fare Box Co.

FARE BOXES, P.A.Y.E. OPERATION

Coleman Fare Box Co.

FARE BOXES, PORTABLE AND STATIONARY

Coleman Fare Box Co.

FILES

Nicholson File Co.

FORGINGS

Champion Machine & Fdry. Co.

Crossen Car Co.

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

FURNACES, OIL AND GAS

Railway Materials Co.

GAUGE COCKS

Ohio Brass Co.

GAUGES, LOCOMOTIVE

Taylor & Arnold

GRATES, SHAKING

Babcock & Wilcox

Polson Iron Works

HAMMERS, CAST STEEL

Dominion Brakeshoe Co.

HANDCARS

F. H. Hopkins & Co.

Crossen Car Co.

F. H. Hopkins & Co.

Rice Lewis & Sons

HANGERS, CABLE

Standard Und. Cable Co. of Can.

HEADLIGHTS

Commercial Acetylene Ry. Lt. and Sig. Co.

Safety Car Htg. & Ltg. Co.

HEADLININGS

Crossen Car Co.

HEATING, CAR

Chicago Car Heating Co.

Consolidated Car Heating Co.

Safety Car Htg. & Ltg. Co.

HOISTS, PNEUMATIC

Taylor & Arnold

HOISTS, STEAM

M. Beatty & Sons

HOOKS

Steel Co. of Canada

HOPPERS, CAR, WET OR DRY

Duner Co.

HOSE, AIR BRAKE AND STEAM

Safety Car Htg. & Ltg. Co.

ILLUSTRATIONS

Acton Burrows, Limited

INSPECTIONS

R. W. Hunt &

Flange Lubrication Should be Automatic

Flange lubrication to be efficient should be automatic, absolutely independent of your engineer, and at the same time the device itself should be so simple and yet so accurate that it will be practically trouble proof. The

Detroit Automatic Flange Lubricator (Pendulum Type)

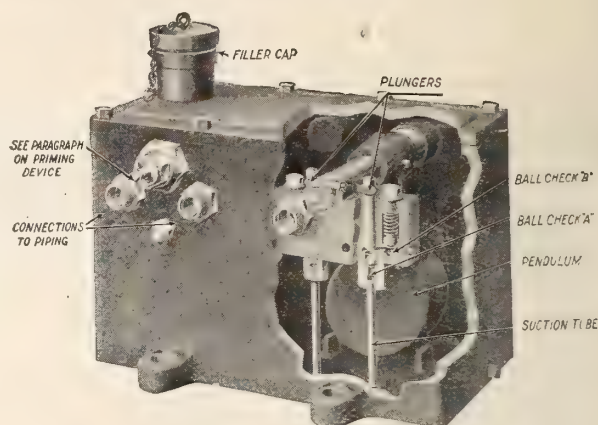
is absolutely automatic and at the same time simple. It is all in the pendulum. Any lateral movement of the locomotive causes the pendulum to swing. This oscillation rotates, rocker-like, the pendulum shaft, which produces alternating strokes of the two plungers in the pumping unit.

The use of the Detroit Automatic Flange Lubricator insures positive lubrication just when it is needed. May we send booklet F-O 81? It contains all the facts as well as drawings. Write to-day.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.

WALKERVILLE, ONT.

Canadian Sales Agents: Taylor & Arnold, Ltd., Montreal.



The Canadian Bridge Co., Limited

Walkerville, Ontario

Locomotive
Turntables
Roofs
Steel Buildings

Manufacturers of
**Railway and Highway
BRIDGES**

Structural
Iron Work
of all
Descriptions

CHICAGO CAR HEATING CO.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES

Canadian Factory and Office—61 Dalhousie St., Montreal

GENERAL OFFICES:
RAILWAY EXCHANGE, CHICAGO, U.S.A.
NEW YORK, GRAND CENTRAL TERMINAL BLDG.
ATLANTA GA., CANDLER BLDG.
WASHINGTON, D.C., MUNSEY BLDG.

A. D. BRUCE, Agent

C. W. Sherman, Pres. and Gen. Mgr.

F. W. Baillie, Vice-Pres.

J. E. Hammond, Secy.-Treas.

Dominion Steel Foundry Company, Limited, Hamilton, Ont.

Locomotive Frames

Car Bolsters

Car Castings

Heavy Machinery Castings

J. S. COFFIN
President

SAMUEL G. ALLEN
1st Vice-President

W. H. COYLE
2nd Vice-President

C. L. WINEY
Sec'y. and Treas.

FRANKLIN RAILWAY SUPPLY COMPANY

Specialists—In Devices That Make for Economy

MAIN OFFICE, 30 CHURCH ST., NEW YORK

CHICAGO OFFICE: 332 South Michigan Ave.

MONTREAL OFFICE: 625 Transportation Bldg.

SAN FRANCISCO OFFICE: 795 Monadnock Bldg.

RAILWAY EXCHANGE

CHICAGO

FERGUSON SHOP FURNACES
MANUFACTURED IN CANADA
THE RAILWAY MATERIALS CO.

SINGER BUILDING

NEW YORK

MACHINE TOOLS

John Bertram & Sons Co.
Pratt & Whitney Co.
MANHOLE FRAMES & COVERS
Canada Iron Foundries
Dominion Brakeshoe Co.
MARINE REPAIRS
Goldschmidt Thermit Co.
MARINE SUPPLIES
Rice Lewis & Sons
METALS
Goldschmidt Thermit Co.
METAL WORK, STRUCTURAL
Canadian Bridge Co.
Dominion Bridge Co.
Jas. W. Pyke & Co.
MILEPOST NUMBERS
Acton Burrows, Limited
MONEL METAL
International Nickel Co.
MOTOR CARS
Fairmont Gas. Eng. and Ry.
Motor Car Co.
MOTORS, TURNTABLE
Taylor & Arnold
NAILS, CUT AND WIRE
Steel Co. of Canada
NICKEL, SHEET, ROD, WIRE & TUBE
International Nickel Co.
NICKEL, METALLIC SHOT & INGOTS
International Nickel Co.
NUMBERS
Acton Burrows, Limited
NUT LOCKS
Positive Lock Washer Co.
OFFICE FITTINGS
Can. Office & School Furn. Co.
OFFICE SIGNS
Acton Burrows, Limited
OILS
Galena-Signal Oil Co.
PACKING
Garlock Packing Co.
PATENT ATTORNEYS
H. J. S. Dennison
H. C. Shipman & Co.
Ross Thomson & Co.
Van Hallen & O'Neil
PILE DRIVERS, RAILWAY
F. H. Hopkins & Co.
PIPE, STEAM
Babcock & Wilcox
PIPE STOCKS
Butterfield & Co.
PIPE, WROUGHT, LEAD AND GALVANIZED
Steel Co. of Canada
PLANERS
John Bertram & Sons Co.
PLATFORMS, STEEL
Standard Coupler Co.
PLOUGHS, CONTRACTORS'
F. H. Hopkins & Co.
PORTER
E. L. Drewry
PUMPS
F. H. Hopkins & Co.
PUMPS, CENTRIFUGAL
M. Beatty & Sons
F. H. Hopkins & Co.
R. D. Wood & Co.
PUNCHES AND SHEARS
Long & Allstatter Co.
PUTTY
Steel Co. of Canada
RAIL BONDS
Ohio Brass Co.
Elec. Railway Improvement Co.
RAIL BENDERS
Canadian Steel Foundries, Ltd.
RAIL JOINTS
Goldschmidt Thermit Co.
The Rail Joint Co. of Canada

RAILS, NEW

Algoma Steel Corporation
Dominion Iron & Steel Co.
J. T. Gardner
J. J. Gartshore
F. H. Hopkins & Co.
RAILS FOR RELAYING
J. J. Gartshore
Jas. W. Pyke & Co.
RAILWAY SUPPLIES
Franklin Railway Supply Co.
F. H. Hopkins & Co.
Rice Lewis & Sons
The Hiram L. Piper Co.
REAMERS
Butterfield & Co.
REPLACERS, CAR AND LOCOMOTIVE
F. H. Hopkins & Co.
RIVETS
Steel Co. of Canada, Ltd.
ROCK CRUSHERS
F. H. Hopkins & Co.
ROPES, DERRICK
Dominion Wire Rope Co.
ROOFING, CAR
Franklin Railway Supply Co.
F. H. Hopkins & Co.
RUBBER GOODS
Can. Consolidated Rubber Co.
SANDERS, PNEUMATIC
Ohio Brass Co.
SAWS, HACK
Diamond Saw & Stamping Co.
SCOWS, DUMP AND DECK
M. Beatty & Sons
SCREW PLATES
Butterfield & Co.
SCRAPERS, WHEEL AND DRAG
F. H. Hopkins & Co.
SCREWS, WOOD AND MACHINE
John Morrow Screw and Nut Co.
Steel Co. of Canada
SEMAPHORE ARMS
Acton Burrows, Limited
SHIPS
Polson Iron Works
SIGNAL HOUSE NUMBERS
Acton Burrows, Limited
SIGNALS
Gen. Railway Signal Co. of Can.
The Hiram L. Piper Co.
SIGNS
Acton Burrows, Limited
SKYLIGHTS
Kinnear Manufacturing Co.
SNOW PLOUGHS
Crossen Car Co.
F. H. Hopkins & Co.
SPIKES, RAILWAY, SHIP OR PRESSED
Nova Scotia Steel and Coal Co.
Steel Co. of Canada
SPlicing TUBES AND COMPOUNDS
Standard Und. Cable Co. of Can.
SPREADER CARS
F. H. Hopkins & Co.
SPRINGS
Canadian Steel Foundries, Ltd.
B. J. Coghlin & Co.
SPRINKLERS, ELECTRIC
Preston Car & Coach Co.
STAPLES
Steel Co. of Canada
STATION NAME SIGNS
Acton Burrows, Limited
STAYBOLT IRON
Taylor & Arnold
STAYBOLTS, FLEXIBLE
Flannery Bolt Co.
STAYBOLTS, LOCOMOTIVE
Flannery Bolt Co.
STAYBOLT TAPS
Butterfield & Co.

STEAM HAMMERS

John Bertram & Sons Co.
STEAM SHOVELS
M. Beatty & Sons
F. H. Hopkins & Co.
STEAMSHIP SIGNS
Acton Burrows, Limited
STEAM TRAPS
Safety Car Htg. & Ltg. Co.
STEEL
F. H. Hopkins & Co.
Nova Scotia Steel and Coal Co.
STEEL, FIRE BOX
Taylor & Arnold
Canadian Steel Foundries, Ltd.
STEEL FOR AXES
Canadian Steel Foundries, Ltd.
STEEL FOR SAWS
Canadian Steel Foundries, Ltd.
STEEL FOR TIRES
Steel Co. of Canada
STEEL SHAFTING
Nova Scotia Steel and Coal Co.
STEEL PLATES
Jas. W. Pyke & Co.
STEEL, TOOL
Canadian Steel Foundries, Ltd.
F. H. Hopkins & Co.
STOKERS, MECHANICAL
Babcock & Wilcox
STRAINERS
Babcock & Wilcox
SUPERHEATERS
Babcock & Wilcox
Locomotive Superheater Co.
SWITCH TARGETS
Acton Burrows, Limited
TACKS
Steel Co. of Canada
TANKS AND TANK FIXTURES
F. H. Hopkins & Co.
Polson Iron Works
TANKS, PORTABLE ACETYLENE, WELDING
Commercial Acetylene Ry. Lt. and Sig. Co.
TAPS
Butterfield & Co.
TELEGRAPH AND TELEPHONE OFFICE SIGNS
Acton Burrows, Limited
TERMINALS, JUNCTION BOXES
Standard Und. Cable Co. of Can.
THERMIT
Goldschmidt Thermit Co.
TIE PLATES
Algoma Steel Corporation
B. J. Coghlin
Nova Scotia Steel and Coal Co.
Steel Co. of Canada
TICKET CASES
Canadian Office & School Fur. Co.
TIRES, STEEL
Jas. W. Pyke & Co.
TOOLS AND SUPPLIES
F. H. Hopkins & Co.
Pratt & Whitney Co.
TOOLS, CAST STEEL
Dominion Brakeshoe Co.
TOOLS, TRACK
John Bertram & Sons Co.
Canadian Steel Foundries, Ltd.
B. J. Coghlin Co.
F. H. Hopkins & Co.
TOOLS, PNEUMATIC
Independent Pneumatic Tool Co.
TRAMWAY EQUIPMENT
J. J. Gartshore
F. H. Hopkins & Co.
TRACK EQUIPMENT
F. H. Hopkins & Co.
TROLLEY BASES
Ohio Brass Co.
Trolley Supply Co.

TROLLEY GUARDS

Ohio Brass Co.
Trolley Supply Co.
TROLLEY RETRIEVERS
Ohio Brass Co.
Trolley Supply Co.
TROLLEY WHEELS
Star Brass Works
TRUCKS, ELECTRIC CAR
Canadian Steel Foundries, Ltd.
TRUSSES, ROOF
Canadian Bridge Co.
Dominion Bridge Co.
TUBES, BOILER
F. H. Hopkins & Co.
TUBE CLEANERS
F. H. Hopkins & Co.
TURNBUCKLES
Canadian Steel Foundries, Ltd.
TURNTABLES
Canadian Bridge Co.
Dominion Bridge Co.
UPHOLSTERY, CAR
Du Pont Fabrikoid Co.
VALVES
Canadian Detroit Lubricator Co.
R. D. Wood & Co.
VALVES, ANGLE AND GLOBE
Ohio Brass Co.
VALVES, BRASS GATE
Ohio Brass Co.
VALVES, LOCOMOTIVE POP
Taylor & Arnold
VARNISHES
Berry Bros.
VENTILATORS, CAR
Automatic Ventilator Co.
VESSELS
Polson Iron Works
WASHERS
Steel Co. of Canada
WASTE
B. J. Coghlin Co.
WATER SOFTENERS & PURIFIERS
Babcock & Wilcox
Dearborn Chemical Co. of Can.
WELDING
Goldschmidt Thermit Co.
WHEELBARROWS
F. H. Hopkins & Co.
WHEEL GRINDERS
Griffin and Brinkerhoff
WHEELS, CAR
Canada Iron Foundries
Jas. W. Pyke & Co.
WHEELS, LOCOMOTIVE
Canada Iron Foundries
WHITE LEAD
Steel Co. of Canada
WIRE AND WIRE ROPE
Dominion Wire Rope Co.
WIRE, BARE COPPER
Standard Und. Cable Co. of Can.
Steel Co. of Canada
WIRE, BRASS, IRON AND STEEL
Steel Co. of Canada
WIRE, INSULATED COPPER
Standard Und. Cable Co. of Can.
Steel Co. of Canada
WIRE GOODS, BRIGHT
Steel Co. of Canada
WIRE, TELEGRAPH AND TELEPHONE
Standard Und. Cable Co. of Can.
Steel Co. of Canada
WIRE, TRANSMISSION AND TROLLEY
Standard Und. Cable Co. of Can.
WRENCHES, CAST STEEL
Dominion Brakeshoe Co.
YACHTS
Polson Iron Works

The Imperial Guarantee and Accident Insurance Co.

of Canada

Imperial Protection Accident and Sickness Insurance
Guarantee Bonds Plate Glass and Automobile Insurance

A Strong Canadian Company

Head Office, 44 King St. W., Toronto, Ont.

Branch Offices:

Montreal, Que., Canada Life Bldg.

Winnipeg, Man., Merchants Bank Bldg.

Calgary, Alta., Canada Life Bldg.

Vancouver, B.C., 546 Pender St. W.

Alphabetical List of Advertisers

A		D		M		N	
Algoma Steel Corporation.....	22	Date, John	76	Montreal Locomotive Works.....	19	National Steel Car Co.	86
Arnold Co.	79	Dearborn Chemical Co. of Canada	14	Morrow, John Screw & Nut Co...	80	Nicholson File Co.	10
Automatic Ventilator Co.	77	Dennis Hotel	74			Norton, A. O., Inc.	12
B		Dennison, H. J. S.	79			Northern Electric Co.	20
Babcock & Wilcox.....	25	Diamond Saw & Stamping Works	75			Nova Scotia Steel & Coal Co....	17
Beatty, M. & Sons, Co.....	78	Dominion Brakeshoe Co.	23				
Berry Bros.	11	Dominion Bridge Co.....	77				
Bertram, John & Sons, Co.....	3	Dominion Iron & Steel Co.....	75				
Bradstreet Company.....	78						
Brown Hoisting Machinery Co...	5						
Buffalo Brake Beam Co.....	24						
Burrows—Acton Burrows, Ltd...	77						
Butterfield & Co.	76						
C							
Canada Iron Foundries, Ltd.....	24						
Canadian Brakeshoe Co.....	74						
Canadian Bridge Co.....	82						
Canadian Bronze, Ltd.....	20						
Canadian Consolidated Rubber Co.	26						
Canadian Detroit Lubricator Co..	82						
Canadian Government Railways..	24						
Canadian Locomotive Co.....	17						
Canadian Marconi Co.....	76						
Canadian National Carbon Co...	84						
Canadian Northern Railway.....	9						
Canadian Office & School Furni- ture Co.	79						
Canadian Pacific Railway.....	16						
Canadian Steel Foundries, Ltd...	16						
Canadian Westinghouse Co.....	2						
Champion Machine & Forging Co.	21						
Chicago Car Heating Co.....	82						
Coghlin, B. J., Co.	1						
Commercial Acetylene Ry., Light & Signal Co.	22						
Consolidated Car Heating Co.....	74						
Crossen Car Co.....	15						
E							
Electric Railway Improvement Co.	21						
F							
Fairmont Gas Engine & Ry. Mo- tor Car Co.	80						
Flannery Bolt Co.	14						
Franklin Railway Supply Co.	82						
G							
Galena-Signal Oil Co.....	6						
Garlock Packing Co.	15						
Gartshore, J. J.	79						
General Ry. Signal Co. of Canada	8						
Goldschmidt Thermit Co.	13						
Grand Trunk Railway.....	12						
Griffin & Brinkerhoff.....	74						
H							
Hart-Otis Car Co.	2						
Hopkins, F. H. & Co.	7						
Hunt, Robert W. & Co.	79						
Hunt-Spiller Mfg. Corporation...	78						
I							
Imperial Bank of Canada.....	76						
*Imperial Guar. & Acc. Ins. Co...	83						
Independent Pneumatic Tool Co...	23						
International Correspond. Schools	20						
International Nickel Co.	76						
J							
Jacobs & Davies.....	79						
K							
Kinnear Manufacturing Co.	80						
L							
Lewis, Rice & Son.....	75						
Locomotive Superheater Co.	21						
Long & Allstatter Co.	11						
O							
Ohio Brass Co.	9						
Ottawa Car Manufacturing Co...	79						
P							
Pedlar People, Ltd.	10						
Piper, The Hiram L., Co.	20						
Polson Iron Works.....	18						
Positive Lock Washer Co.	78						
Pratt & Whitney Co. of Canada..	25						
Preston Car & Coach Co.	79						
Pyke, J. W. & Co.	23						
R							
Rail Joint Co. of Canada.....	85						
Railway Materials Co.	82						
Roberts & Schaefer Co.	79						
S							
Safety Car Heating & Light. Co.	13						
Shipman, Harold C., & Co.....	79						
Sinclair, Angus	79						
Standard Coupler Co.	79						
Standard Underground Cable Co. of Canada	78						
Star Brass Works.....	25						
Steel Co. of Canada.....	4						
T							
Taylor & Arnold.....	22						
Terry & Tench Co.	79						
Thomson, Ross & Co.	79						
Trolley Supply Co.	19						
V							
Van Hallen & O'Neil.....	79						
W							
Wood, R. D., & Co.	74						

*Advertisements marked with an asterisk appear in alternate issues.

Good Motor Operation Demands Proper Brush Selection

No one grade of motor brushes will give the best results on all motors.

To fit the proper brush to suit operating conditions means motor efficiency. It means less commutator wear and lower brush up-keep cost.

We have a grade of brush to suit every condition met with in railway and stationary motor operation.

We have a staff of brush engineers who will gladly make recommendations.

Write for our brush data sheet.

Canadian National Carbon Co., Limited
99 Paton Road, Toronto, Ont.

Our Trade-Mark

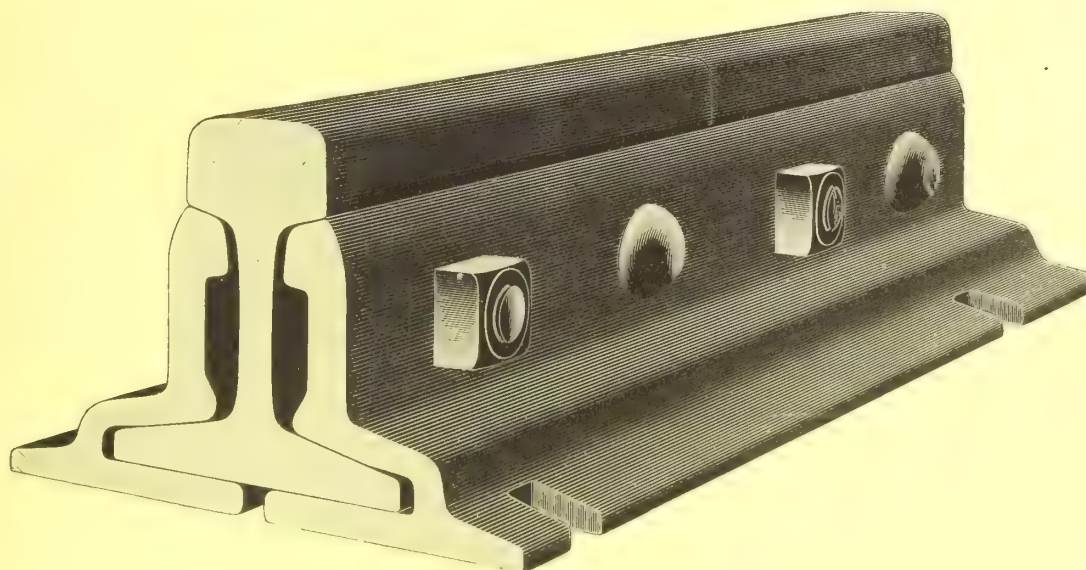


See that your brushes
bear this stamp.

The Rail Joint Company of Canada Limited

606 McGill Building, MONTREAL

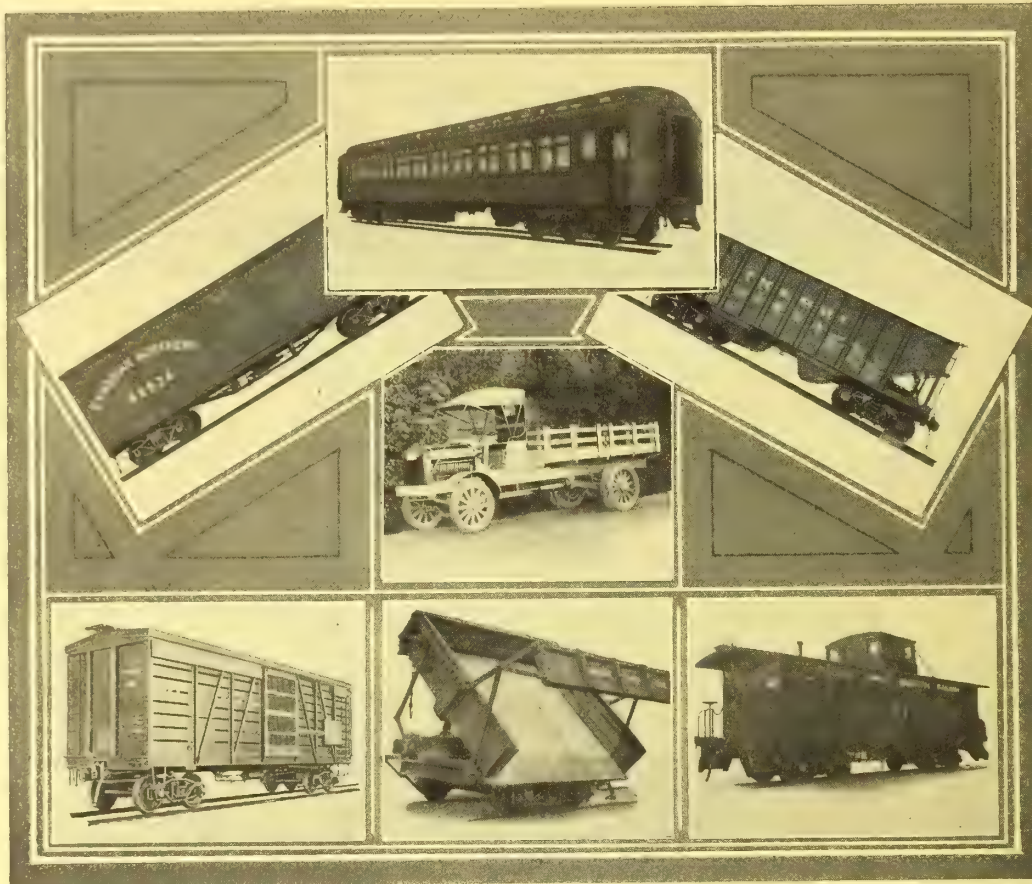
Makers of Base-Supported and 100% Rail Joints for Standard, Girder, and Special Rail Sections. Also Joints for Frogs and Switches; Insulated Rail Joints, and Step or Compromise Rail Joints. Protected by Patents.



Continuous Rail Joint.

This Company's Product

Is an acknowledged standard, not in an experimental stage; HIGH CARBON STEEL of the best quality used exclusively; Hot-Worked; Oil-Quenched when desired.



WE MAKE

Railway Passenger Cars,
Freight Cars, Oil Tank
Cars, Truck Bolsters,
Underframes, Interurban
Electric Cars, Suburban
Cars, Sleeping Cars, Din-
ing Cars, Logging Cars,
Contractors' Dump Cars.
**NATIONAL MOTOR
TRUCKS.**

Write for Particulars.

National Steel Car Company, Limited

Works and Operating Offices:

HAMILTON - CANADA

Branch Offices: LONDON, ENG.

MONTREAL

NEW YORK

Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 219

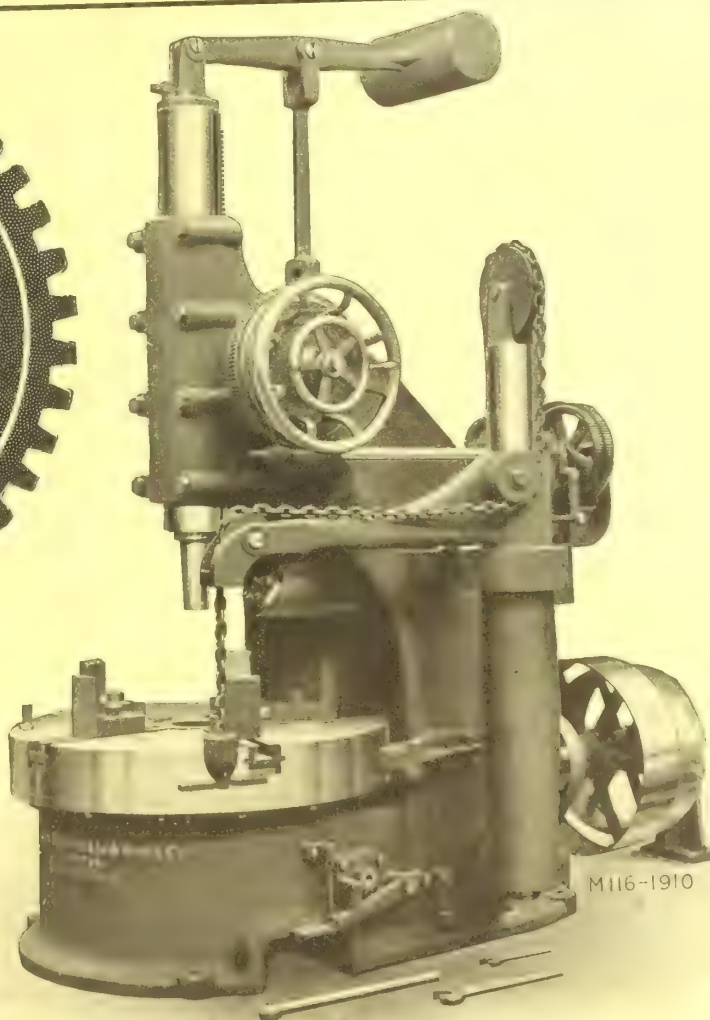
TORONTO, CANADA, MAY, 1916

Subscription Rates, Page 189



42-inch Car Wheel Borer

*Equipped with Air Crane
for Wheels.*



We Manufacture a Full Line of Locomotive and Car Shop Machinery

Write us about the machine or machines in which you are interested—we gladly send photographs and full specifications.

The John Bertram & Sons Co., Limited
DUNDAS, ONTARIO, CANADA



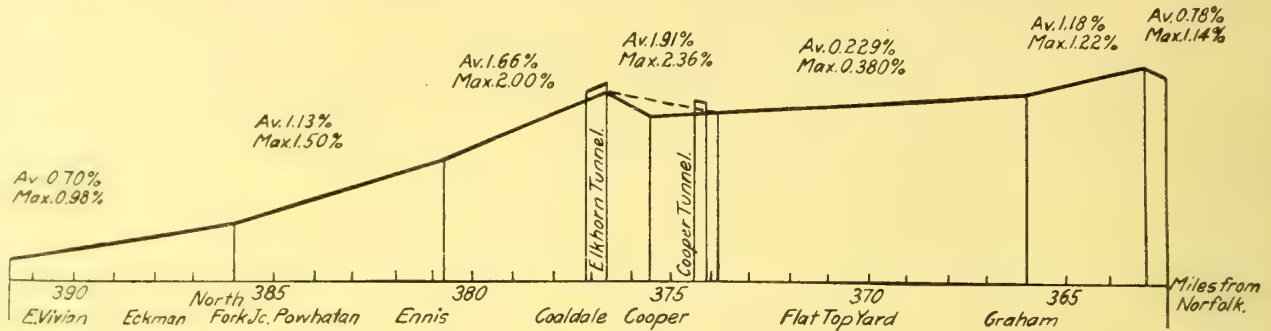
MONTREAL
723 Drummond Bldg.

WINNIPEG
1205 McArthur Bldg.

VANCOUVER
609 Bank of Ottawa Bldg.



Norfolk & Western Elkhorn Grade Electrification



The Heaviest Tonnage Mountain-Grade Electrification in the World

One-way freight traffic in excess of 1150 cars per day Eastbound, has been attained.

Normal tonnage-trains of 3250 tons, trailing, on the heaviest grade section.

4800-ton "Filled-Out" trains on the lesser grades.

Down-grade operation is controlled by automatic regenerative braking.

This electrified system involves :

THE GREATEST POWER HOUSE CAPACITY per engine operated.

THE GREATEST SUBSTATION CAPACITY per mile of line.

THE GREATEST LOCOMOTIVE CAPACITY in service per mile of line.

THE GREATEST AMOUNTS OF POWER EVER DELIVERED to individual locomotives.

THE GREATEST LOCOMOTIVE TRACTIVE EFFORTS by equipments of this type.

THE HIGHEST, HEAVY-TRAIN SPEEDS IN THE WORLD against similar conditions.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

TORONTO, Traders Bank Bldg. MONTREAL, 52 Victoria Sq. OTTAWA, Ahearn & Soper, Ltd. HALIFAX, 105 Hollis St. FT. WILLIAM, Telfer Bldg. WINNIPEG, 158 Portage Ave. E. CALGARY, Grain Exchange Bldg. EDMONTON, Dominion Bldg. VANCOUVER, Bank of Ottawa Bldg.



Figure the Saving Alone in Laying -

the time and money saving value of a culvert which may be graded, bedded and permanently placed with a few hours labor. Don't let your culvert work cost you more than it should. Build with

PEDLAR'S "PERFECT" TONCAN METAL CULVERTS

and make a definite saving—a worth-while saving—in the cost of laying your road.

Pedlar's TONCAN Culverts have the double advantage over concrete of being frost-proof and elastic, allowing the desirable "springy" road bed to be preserved.

Made to specifications in sizes from 8 to 84 inches. Supplied in any length up to 40 feet. Coupling bands supplied for large lengths. Safely and conveniently shipped in flat cars.

Write for complete Culvert Reference Book No. 4 R. M., giving valuable data and drainage tables.

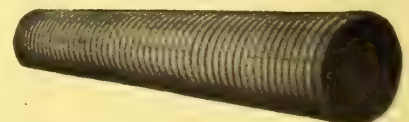
THE PEDLAR PEOPLE, Limited

(ESTABLISHED 1861)

Executive Office and Factories, OSHAWA, ONT.

Branches : MONTREAL OTTAWA TORONTO LONDON WINNIPEG

(S.-Y.)



BROWNHOIST Locomotive Crane

for quick construction on all kinds of railroad work such as placing concrete—erecting the forms—erecting structural members—driving piling—laying rails—handling ties—excavating—placing back fill and all general hoisting work.

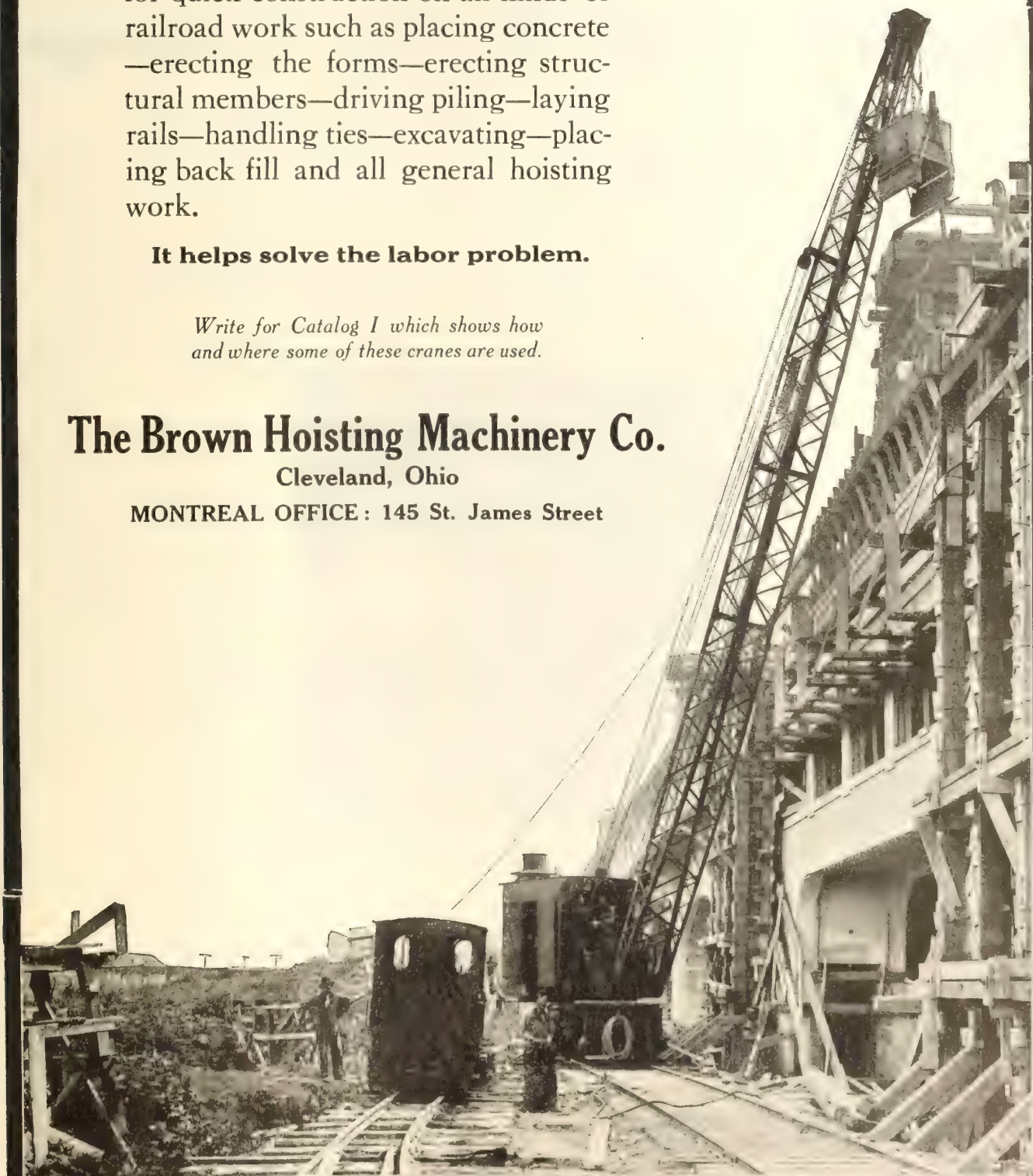
It helps solve the labor problem.

Write for Catalog I which shows how and where some of these cranes are used.

The Brown Hoisting Machinery Co.

Cleveland, Ohio

MONTREAL OFFICE: 145 St. James Street



The Steel Company of Canada, Limited

HAMILTON, CANADA

Special Steel Marine Forgings

When forgings are required to stand the strain of rough weather, and to prove themselves reliable and dependable, write us for particulars and prices.

We have the facilities for the production of heavy steel forgings of all kinds, including:

Connecting Rods
Crank Shafts
Eccentric or
Cam Forgings
Marine Engine
Forgings
Piston Heads
Piston Rods
Shafting



Stern Frame of Steamship Hamonic

Rounds
Squares
Rudder Frames
Stern Frames
Side Rods
Steam Engine
Forgings

District Sales Offices:

HAMILTON MONTREAL TORONTO WINNIPEG

W. A. MacLennan, Vancouver, B.C.
J. B. H. Rickaby, Victoria, B.C.

H. G. Rogers, St. John, N.B.
Geo. D. Hatfield, Halifax, N.S.

Galena-Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office — 603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil

in Headlights, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

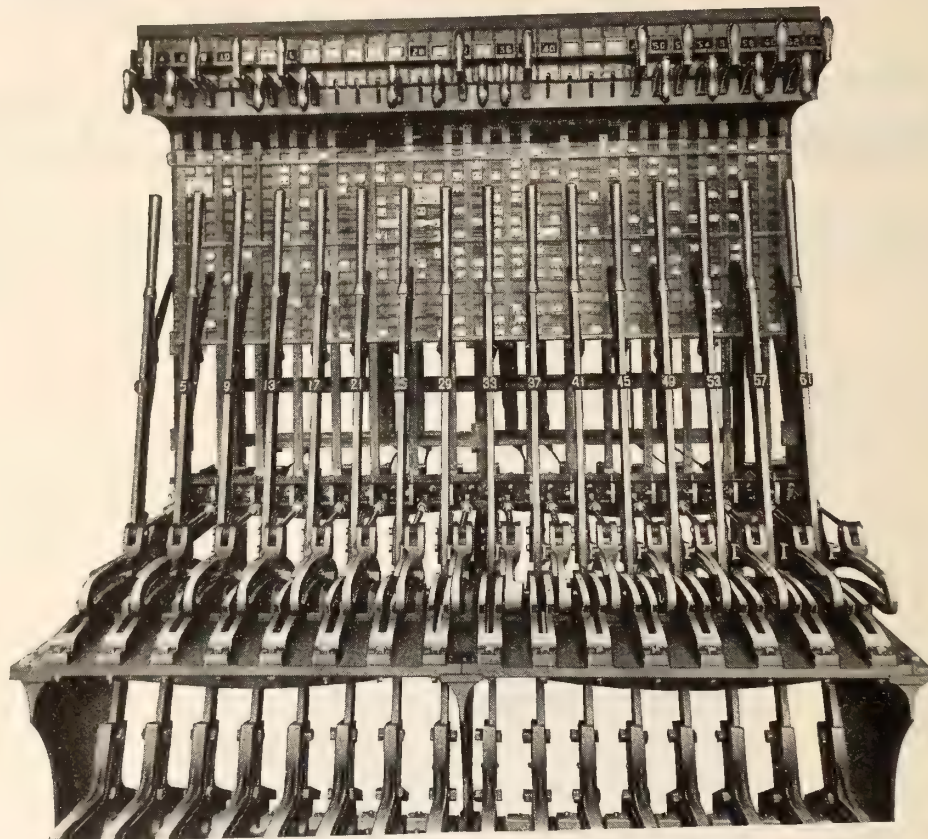
Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and Correspondence Solicited.

S. A. MEGEATH,
PRESIDENT.

G-R-S Electro-Mechanical Interlocking



THE G-R-S Electro-mechanical Interlocking Machine combines the well-known features of the G-R-S Model 2 Unit-lever-type Electric-Interlocking Machine with the G-R-S Improved Saxby & Farmer Interlocking Machine.

The interlocking parts between the electric and mechanical levers are substantial and simple; the circuit controllers, arranged vertically in the rear of the electric machine, are adjustable and have a total capacity of 30 contacts per lever.

Bulletin 132 will give you complete information

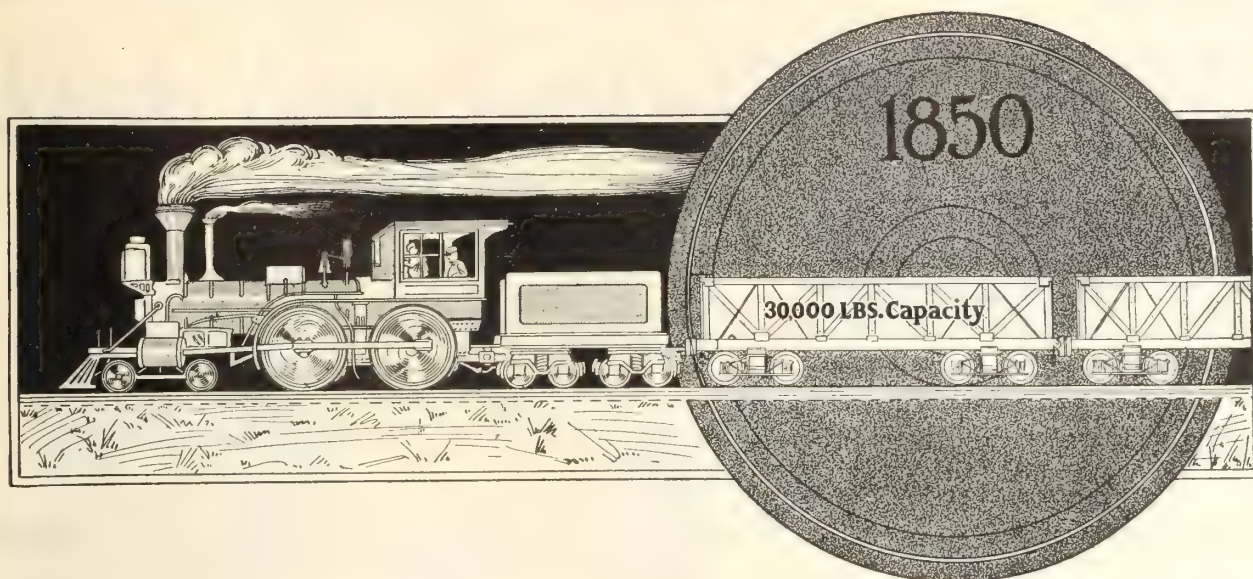
"Safety First"

GENERAL RAILWAY SIGNAL COMPANY
OF CANADA LIMITED



Office and Works, Lachine, Quebec

Branch Office, Winnipeg, Manitoba



The Wonderful Single Service Chilled Iron Wheel

The "Fins" at the sides of the steel rail are the result of cold rolling produced by heavy wheel loads which cause the metal in the rail to flow, producing tremendous internal stresses, sufficient in many cases to pull the metal asunder.

Eccentricity of the treads of soft wheels deliver intense impact blows to the rail, which in connection with the internal stresses of large proportions result in rail breakages.

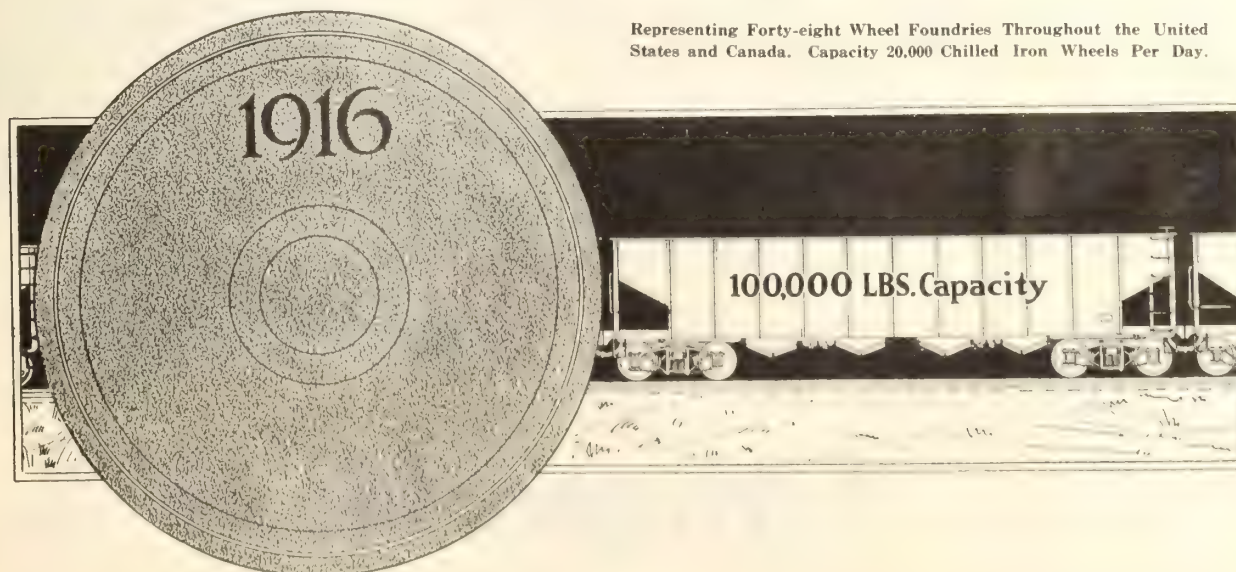
On some types of wheels the "Fins" at the edge of the wheel "rims" are caused by the flowing of the metal because of the softness of the material.

No "Fins" can be found on Chilled Iron Wheels, because Chilled Iron is so hard that it will not crush or flow under heavy loads and the wheels retain their rotundity.

25,000,000 now running.

Association of Manufacturers of Chilled Car Wheels
1214 McCormick Building, Chicago, Ill.

Representing Forty-eight Wheel Foundries Throughout the United States and Canada. Capacity 20,000 Chilled Iron Wheels Per Day.



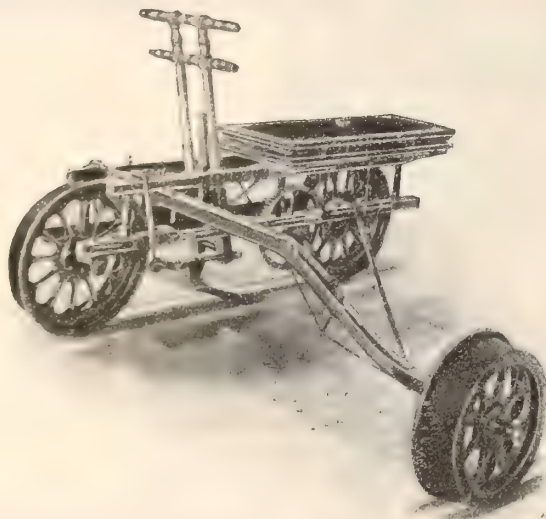


USE
**"Dominion" Extra Flexible
 Dredge Ropes**

Stocks Carried In
 Montreal, Winnipeg and St. Catharines

Long Life Guaranteed because of uniformity of structure, high quality
 and skilled workmanship maintained throughout manufacture.

The Dominion Wire Rope Company, Limited, Montreal



Velocipedes

Hand Cars

Push Cars

Light Rails—

Frogs—Switches

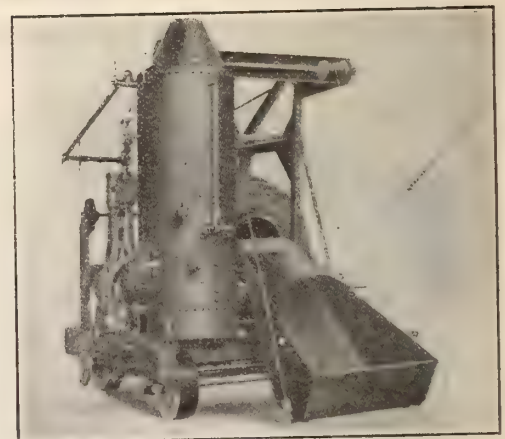
**"Ransome" Concrete Mixers for any
 Combination of Power—**

Concrete Carts—

Buckets—

Wheelbarrows—

Steel — Tools — Saw Tables.



Branch:
St. Catharines, Ont.

F. H. Hopkins & Co

Head Office:
MONTREAL

Did You Get Your Copy?



Some were overlooked in the distribution. It is impossible to eliminate all errors from a mailing list of many thousand names.

We want to place a copy of this complete New Catalog in the hands of everyone who buys or uses

**Overhead Line Material
Rail Bonds and Tools
Car Equipment Specialties
High Tension Insulators**

If you are in that class and did not receive a copy, you will do a good turn for yourself and a favor for us if you send us your name, company and position.

The Ohio Brass Co., Mansfield, Ohio

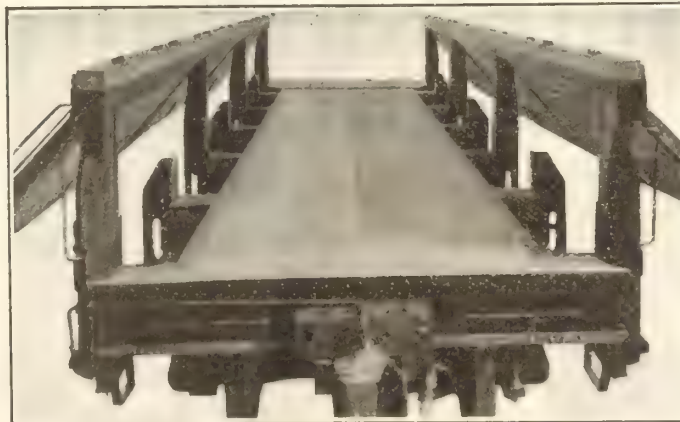
Side Ballasting With One Side Closed

The Latest in Ballast Cars

33 $\frac{1}{3}$ % More Door
Opening Area

Less Stakes to
Obstruct the
Dumping Material

No clogging of the
Material or Boulders
Between the Plow
and Stakes



Dumps Clean and
Quicker in Any
Material

No More Breaking
of Stakes or Cables

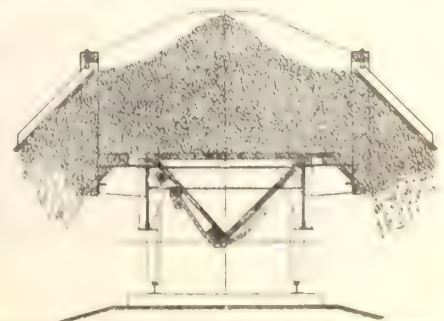
The Car That Will
Give Maximum
Service With
Minimum Repairs

The Pockets At Each Side Allow
the Material to Get Away Relieving
the Car Side and Stakes of Strain.

ACTUAL SERVICE HAS PROVEN ITS EFFICIENCY
LET US SHOW YOU THIS CAR

DESIGNED, BUILT, AND PATENTED IN CANADA

The HART-OTIS CAR CO. Limited, MONTREAL





Ever Shaved by a Blunt Razor?

Remember how long it took; how you scraped away and were finally disgusted with the shave?

Well, that is how a workman feels when using a file that has reached its "inefficient point." He gets irritated—does not take the same pleasure in his work. The foreman thinks he is slow. There is no satisfaction anywhere.

But, give that man a new file and he puts new enthusiasm and new energy into the job.

This is a homely illustration, but it is true, for it is human nature.

The line of least resistance and greatest efficiency in shop practice to-day is to give men new files to work with when their files reach the "inefficient point."

Manufacturers, suggest to your superintendents,

Superintendents, instruct your foremen,

Foremen, tell your men

to turn in old files the moment they reach their "inefficient point." It costs less for a new file than it does to have a man slowed down and irritated by an old file.

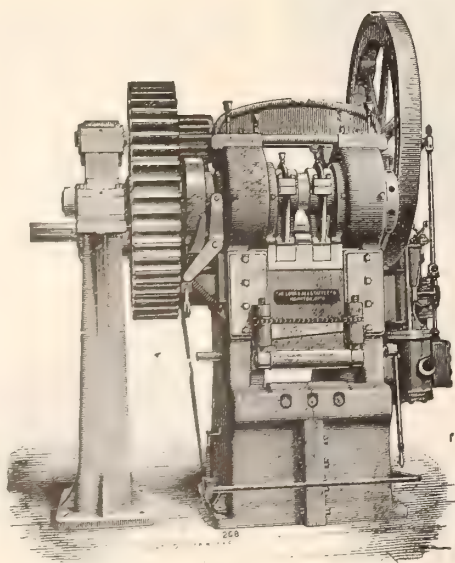
Nicholson File Company

Port Hope

(Dealers Everywhere)

Ontario

Power Punching and Shearing Machinery



Gate Shear---Steam-Driven

Over 350 sizes and styles for all kinds of light and heavy work designed and manufactured by

The Long & Allstatter Co.

Hamilton, Ohio, U. S. A.

Riveting Machines Tire Welding Machines

Armature Disc Notching Machines

Tire Bending Rolls Beam Coping Machines

Bending and Forming Machines

Write for Catalogue if interested.

Correspondence invited.



Grand Trunk Hotels

The Chateau Laurier, Ottawa, Ont.

Accommodation 350 Rooms. Rates \$2.00 per day and upwards. European Plan.

The Fort Garry, Winnipeg, Man.

Accommodation 300 Rooms. Rates \$2.00 per day and upwards. European Plan.

The Macdonald, Edmonton, Alta.

Accommodation 250 Rooms. Rates \$2.00 per day and upwards. European Plan.

Write for illustrated booklets, sent on application to Resident Manager.

The Double Track Route

Provides

Service	Comfort
Safety	Courtesy
Speed	Convenience

Winter Tours to California and all Pacific Coast Points. Florida, Texas, New Orleans, Etc.

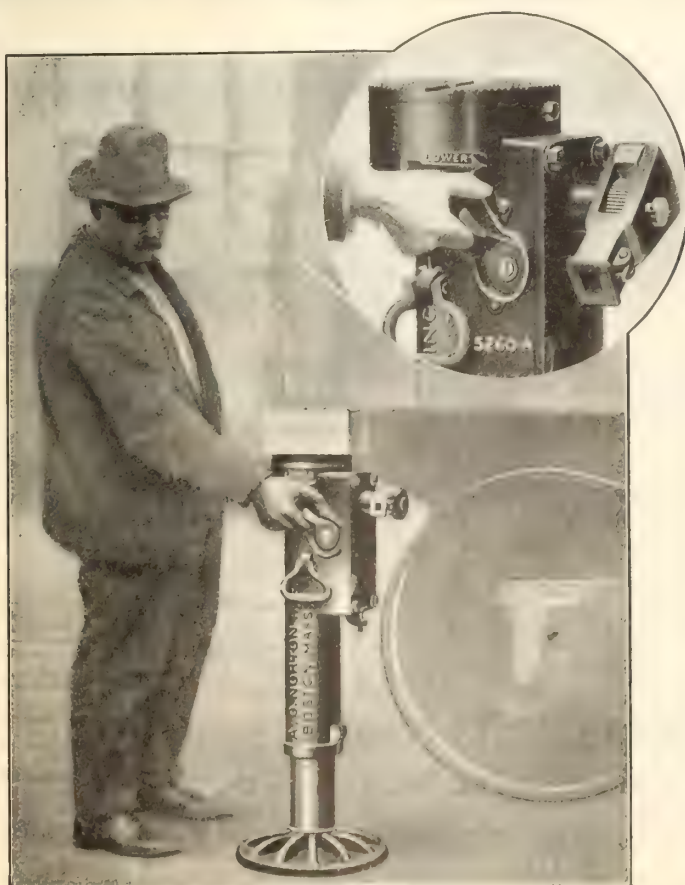
Winter Tours Tickets now on sale. Stop over privilege allowed.

The New Way West

Via the Transcontinental and Grand Trunk Pacific Railway affords new scenery, new interests. Write to any Agent of the Company for advertising matter, rates, and all particulars.

G. T. BELL,
Passenger Traffic Manager, Montreal

W. S. COOKSON,
General Passenger Agent, Montreal



Don't Pump Your Jack Down

Lower the Load by "Pressing the Button"

The Norton Self Lowering Jack

is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

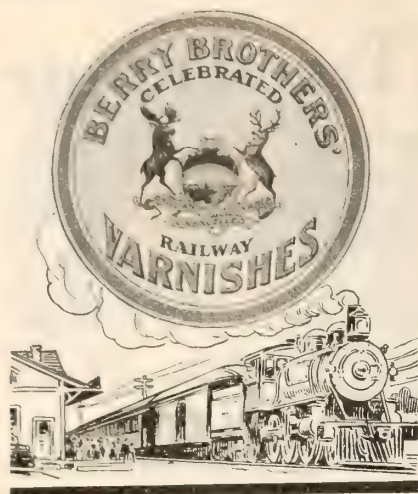
Send for Illustrated Catalogue No. 28.

A. O. Norton, Limited

Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents:
MUSSENS LIMITED

Montreal Toronto Winnipeg Cobalt Calgary
Vancouver



Berry Brothers' Railway Varnishes

Represent Nearly 60 Years of Varnish Making Experience

Berry Brothers' extensive line of Railway Varnishes makes it possible for you to purchase the right varnish for any demand.

Here are a few finishes you should know.

Locomotive Black

A fossil gum varnish of the highest grade—for the best attainable finish on locomotives, tenders and valuable rolling stock, combines excellence with durability—efficient because its use is true economy—a case of the best being the cheapest.

Front End Black

For the front end of locomotives. It covers well, makes a handsome jet black finish, and stands a high degree of heat without injury.

Smoke Stack Black

Made especially for use on smoke stacks, producing a jet black and brilliant lustre, and resisting heat of a high degree without injury.

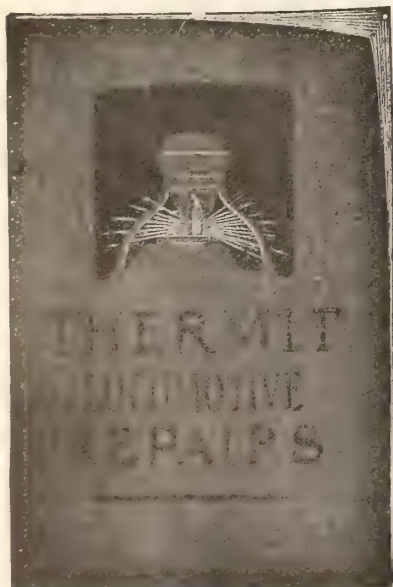
Let us send you a copy of our Railway Varnish catalog, just issued

BERRY BROTHERS
(INCORPORATED)
World's Largest Varnish Makers

WALKERVILLE

ONTARIO

465 Railroad Shops in the United States and Canada Use the Thermit Welding Process



This comprises practically all the shops of importance in North America, and it can be said without exaggeration that the list of railroads using Thermit includes practically every system from the small road having only three or four locomotives to the largest system in the world having many thousand locomotives.

If by any chance your shop is not using Thermit, you should investigate the process and see how effectively and economically it will handle the many repairs on locomotive frames and other sections.

Remember that the greatest railway systems in the world use hundreds of thousands of pounds of Thermit. They do not use it for any reason except that it "delivers the goods" and has proven itself a profitable investment.

Let us mail you our new pamphlet, No. 2144, which contains full information on the use of Thermit in Railroad Shops.

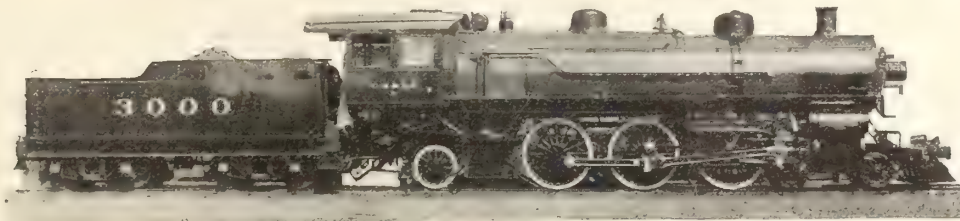
We have a well equipped shop in Toronto, Ont., for the manufacture of Thermit and appliances used with it.

Goldschmidt Thermit Company

103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco 7300 So. Chicago Ave., Chicago
90 West Street, New York

Let us send you this pamphlet.



Scientific Treatment of Boiler Waters

Dearborn Service to Railroads

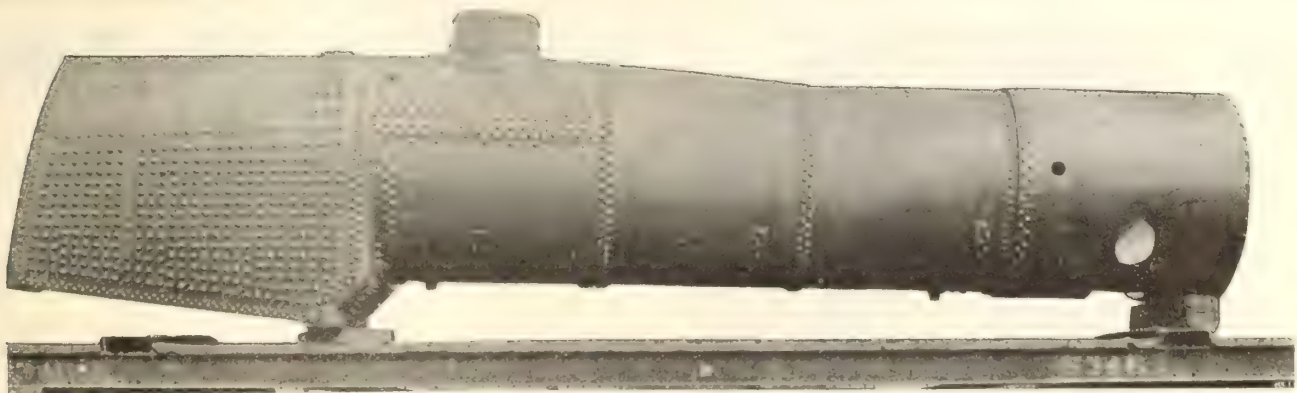
Every time an engine failure takes place it means a large expense in dollars to the railroad company in time lost, impairment of service, and cost to send another engine to the rescue. Every time a locomotive goes to shop for repairs, it represents many thousands of dollars invested capital which is earning no revenue.

By the use of Dearborn Treatment engine failures due to the boiler foaming or leaking can be entirely eliminated. Dearborn Treatment counteracts the foaming tendency in waters of that type, and prevents scale formation, and the corrosive and pitting action that results in leaks. By thus overcoming the bad effects of the waters used, and keeping the boiler tubes and sheets free from

incrustation, the engine may be kept in service longer between boiler washings, and the period between shop-pings for repairs of this character will be much longer. There are also great savings in fuel and lubricating oil, and the engine will always be in condition to haul full tonnage.

Dearborn Chemical Company of Canada, Limited

Office and Works: 1220-1230 Dundas Street, Toronto, Canada



THE ART OF STAYING—The locomotive fire box will advance in just that proportion as suitable and adequate means are provided to enable the fire box to expand under the least restriction.

STAYBOLTS BREAK—when the stress of fire box expansion is too severe, and fire sheets distort and crack when staybolts are too rigidly connected to same.

THE TATE FLEXIBLE STAYBOLT—is designed and made to give satisfactory results in the final measure of its usefulness, as an economic, safe and reliable factor in reducing the costs of fire box repairs and maintenance.

ANY ARTICLE THAT CONTRIBUTES—to the service value of the locomotive as an earning factor is well worth considering carefully. From the knowledge of what has been accomplished by the use of the Tate Flexible Staybolt, we feel confident that all our patrons are well aware of its true value.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

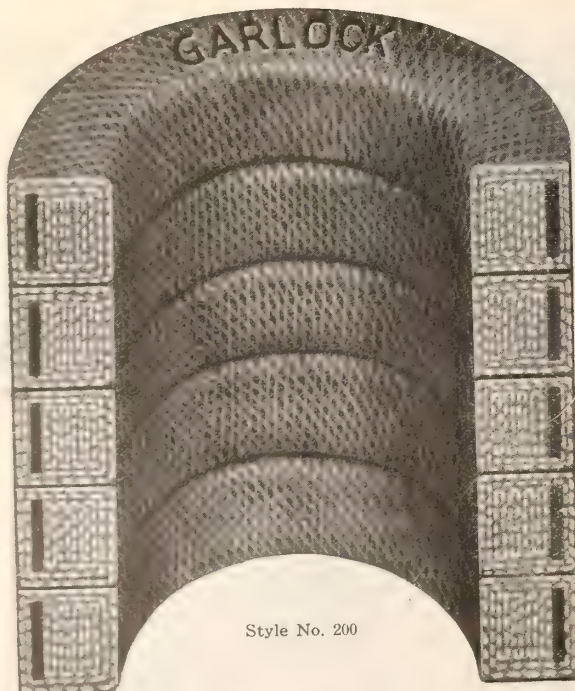
Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.

Modern High-Class
ROLLING STOCK



Passenger, Freight
 and
 Electric Railway
 Car Castings,
 Forgings
 and Repair Parts.

Crossen Car Company, Limited
 Cobourg - Ontario



Style No. 200

**Garlock High Pressure Piston
 Rod Packing**

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.

THE GARLOCK PACKING COMPANY

- Hamilton, Ontario



Branches :
 Montreal, Que., 342 St. James St. East Toronto, Ont., Continental Life Bldg.
 Winnipeg, Man., Galt Building



CANADIAN STEEL FOUNDRIES LIMITED

STEEL CASTINGS - MANGANESE STEEL CASTINGS
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK
BAR STEEL

GENERAL OFFICES
TRANSPORTATION BLD'G
— MONTREAL
BRANCH OFFICE — TORONTO

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL

Nova Scotia Steel and Coal Co., Limited

Manufacturers of

MARINE, RAILWAY AND GENERAL ENGINEERING FORGINGS OF ALL SHAPES AND UP TO 40 TONS IN WEIGHT, MADE FROM BEST ORDINARY OR HARMET FLUID COMPRESSED OPEN-HEARTH STEEL. OUR FORGE IS EQUIPPED WITH THE MOST MODERN STEAM HYDRAULIC PRESSES.

RAILWAY TRACK MATERIAL, fish plate, tie plate, track bolts, spikes, tee rails—12 to 40 lbs. per yard.

ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

ALSO MINERS AND SHIPPERS OF THE CELEBRATED "OLD SYDNEY" COAL.
HIGH CALORIFIC VALUE—LOW ASH—UNEXCELLED FOR STEAM-RAISING PURPOSES.
BEST HOUSE COAL MINED IN CANADA.

Collieries, Iron and Steel
Furnaces:
SYDNEY MINES, C.B.

Coal Shipping
Piers:
NORTH SYDNEY, C.B.

Finishing Mills, Forge, and
Engineering Shops:
NEW GLASGOW, N.S.

INQUIRIES SOLICITED

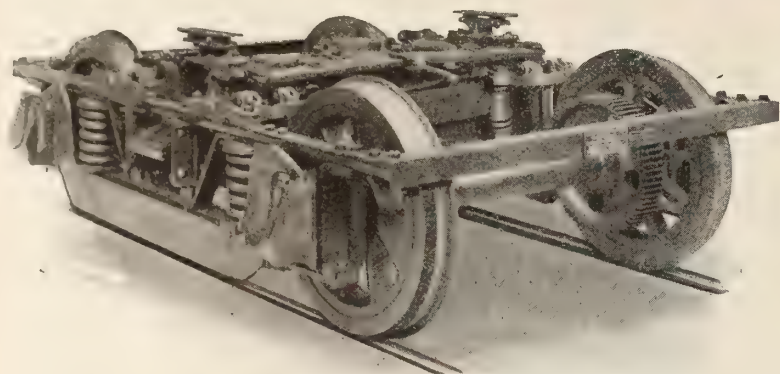
Western Steel Sales Office:
Room 14, Windsor Hotel,
Montreal, Que.

Western Coal Sales Office:
219, Board of Trade Bldg.,
Montreal, Que.

Head Office:
New Glasgow, N. S.

Canadian Baldwin Electric Trucks

Interurban Service



Canadian Baldwin Trucks, Class 84-30-AA, built for Lake Erie and Northern Railway, Ontario.

The truck illustrated is designed for high speed on electric railways, and has a rated carrying capacity of 30,000 pounds on the centre plate.

It has frictional side bearings and is of the equalized pedestal type.

Canadian Baldwin trucks, solve the problem of minimum weight, economical maintenance, simple construction, noiseless operation and easy riding.

There is comfort in riding on roads where Canadian Baldwin Trucks are used.

Manufactured in Canada by

Canadian Locomotive Company, Limited
KINGSTON, ONTARIO

Car Foremen Are Passing These Words Along

Sanitary—Comfortable—Weather Proof—Water Proof—Non-Peeling—Non-Splitting—easily cleaned—tough, but pliable—easily applied—many weights, widths, colors—public likes it—low in cost.

This Trade Gossip is Good for



REG. U. S. PAT. OFF.

FABRIKOID'S Qualities Can't Have Too Much Publicity

More and more railroad men in a position to know are talking to their friends on other roads about the superior quality of Du Pont Fabrikoid for car seats, curtain bindings, cab cushions and vestibule curtains. Fabrikoid is worthy of every word of praise given it.

Because it Always Makes Good With the User

Mere claims in words mean nothing but facts of service from the user will substantiate any statement we have ever made about Fabrikoid.

If you have not asked for a sample, we will appreciate receiving such a request from you now.

Du Pont Fabrikoid Company

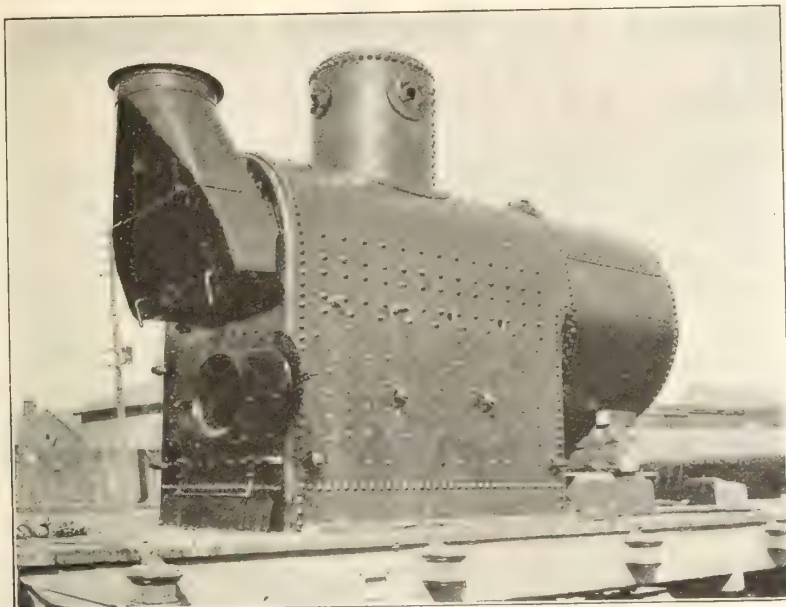
Canadian Factory, Toronto, Canada

Du Pont Building, Wilmington, Del.

WENDELL & MacDUFFIE COMPANY

Railroad Department Representatives

59 Broadway, New York



58-inch Square Fire Box Marine Boiler for 120 lbs. working pressure. This boiler has 46 tubes 3 ins. diam. x 8 ft. 6 ins. long, and three fire flues, two of which are 9 inches diam. and one is 16 inches diam. It was built for the Lakeside Dredging Company of Windsor, Ont., and was complete with grates, mountings, smoke box and smoke stack.

Steel Shipbuilders Engineers and Boilermakers

Dredges, Hydraulic and
Dipper Type; Steel Steam-
ers, full Canal Size; Tugs,
Barges and Scows

Marine Engines and
Boilers, all Sizes

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto

New Route to the West Between TORONTO AND VANCOUVER By Canadian Northern Railway Via

Port Arthur, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Prince Albert, North Battleford, Calgary, Edmonton, Kamloops, New Westminster, Vancouver, Victoria, and All Western Points.

Leave Toronto 10.45 P.M.
Mon., Wed., Fri.



Connections to and from
all points.

Electric Lighted Sleepers, Dining Cars and First-Class Coaches.

For full particulars, through tickets to all points and Berth reservations, apply or write to R. L. FAIRBAIRN,
General Passenger Agent, 68 King St. E., Toronto, Ont.

Are You in the Market for Trolley Catchers, Retrievers, Bases or Head Lights

We manufacture Knutson No. 5 Trolley Retriever, Knutson No. 2 Trolley Retriever, The Ideal Trolley Catcher, The Simplex Trolley Base, The Peerless No. 10 Roller-bearing Trolley Base, The Peerless Check Valve, The Peerless Junior Head Light, The Perfect Head Light, The Hollis Safety Fender, No. 3 Detachable Fender.

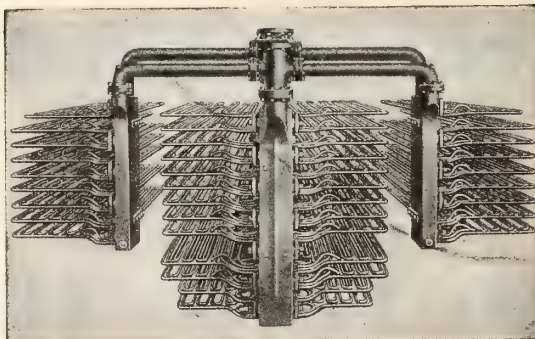
Write our Canadian Representatives Allen General Supplies, Limited they will be pleased to give you complete information as to any of the above as well as our other lines.

Trolley Supply Company, Canton, Ohio

Address all correspondence to Allen General Supplies, Limited, 205 Yonge St., Toronto

Fire Tube Marine Superheater -- Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler h.p. from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, New York, N.Y.

Peoples Gas Bldg., Chicago, Ill.

Algoma Steel Corporation, Limited

Manufacturers of

Steel Rails, Splice Bars, Tie Plates, Forging Billets, etc.

We would be pleased to have your enquiries for 1916 deliveries.

Works and Sales Department: Sault Ste. Marie, Ontario, Canada

The Light of Day on the Right of Way

Headlights

Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

Car Lighting

Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency with economy. Standard cylinder supplies from one to two months' lighting of the average car.

Signals

Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

Commercial Acetylene Railway Light and Signal Company

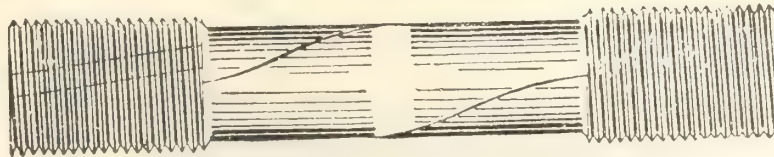
103 BAY STREET, TORONTO

Main Office, 80 Broadway, New York

Branches, Atlanta, Boston, Chicago, San Francisco

American Flexible Staybolts

Manufactured in Montreal



Made of the best standard staybolt iron, adding flexibility by process of making as shown above---closely approximating a rope structure.

Write for booklet on subject.

TAYLOR & ARNOLD, Limited
MONTREAL WINNIPEG

Jas. W. Pyke & Company, Limited

Iron, Steel and Metal Merchants

Locomotive, Driving, Engine and Tender Truck Axles, Passenger, Freight, and Electric Tram Car Axles—To Standard or Railway's own Specification.

Staybolt and Engine Bolt Iron—Quality and Service Unexcelled.

Steel Plates—Firebox, Flange and Tank Qualities.

Structural Shapes—Beams, Channels, Angles, Tees, Zees, etc.

Steel Billets and Forgings—of all descriptions.

Locomotive Boiler and Superheater Tubes—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
232 St. James Street,

Montreal

A Land of Re-Creation

The SUMMERS from May to October in Eastern Canada are probably as enjoyable as those in the most favoured part of the world that may be chosen for comparison.

Sea-Shore, Forest and Stream

Sunny skies, delightful temperature, invigorating air, combined with an endless variety of picturesque beauty, the Maritime Provinces are becoming more and more what nature evidently intended they should be—a land of Re-Creation.

Write General Passenger Department

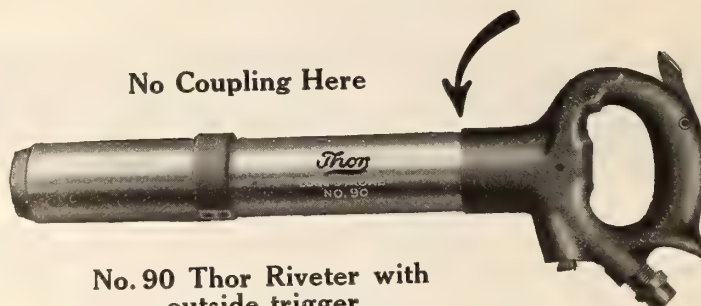
Canadian Government Railways

Moncton, N. B., for 1916 Publications

Thor

One Piece Pneumatic Long Stroke Riveting Hammer

No Coupling Here



Made from a solid drop forging with no connection between barrel and handle. Positively no leakage of air.

No. 90 Thor Riveter with outside trigger

Most powerful, durable and economical hammer on the market. Especially adapted for marine work. Used by most of the leading shipyards.

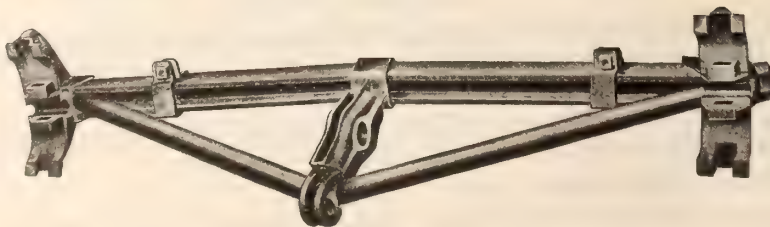
Furnished on Trial—FREE.

Independent Pneumatic Tool Company
334 St. James St., Montreal, Que.

Buffalo Brake Beam Company

BUFFALO BEAMS ARE BEST BEAMS

Offices:
NEW YORK
30 Pine Street
ST. LOUIS
Syndicate Trust Bldg.
MONTREAL
195 Commissioner St.



Works:
BUFFALO,
N.Y.

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment



The Star Brass Works

Largest Exclusive Trolley Wheel Makers in the World.

Kalamazoo

Michigan



Canada Iron Foundries, Limited

Chilled Tread Cast Iron Car Wheels for All Services
Cast Iron Water, Gas and Culvert Pipe,
Flanged Pipe and Specials
Railway Castings

HEAD OFFICE :

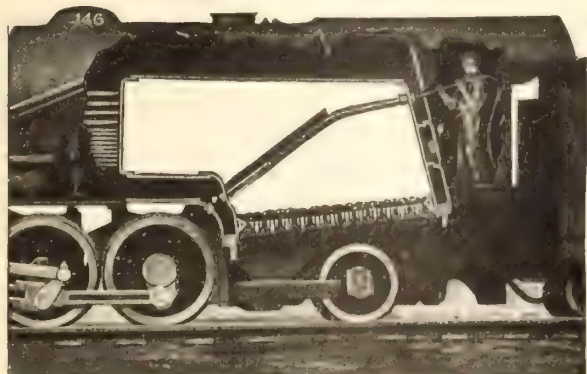
Mark Fisher Building

- - -

Montreal



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes.

Lagonda Arch Tube Cleaners

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

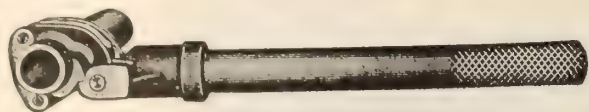
Other Lagonda Boiler Room Specialties are described in our General Catalogue L-8. Send for Copy.

Babcock and Wilcox, Limited

Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Building

The Parmelee Pipe Wrench



Price List C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 in.	\$5.00	\$2.25	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 in. \$.75
20 in.	2½	$\frac{3}{4}$, 1, 1¼, 1½, 2 in.	7.50	2.50	$\frac{3}{4}$, 1, 1¼ in. 1.00 1½, 2 in. 1.25
25 in.	3½	1½, 2, 2½, 3 in.	7.50	3.00	1½, 2, 2½, 3 in. 1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Limited
Toronto, Canada

"The Toothless Wonder"

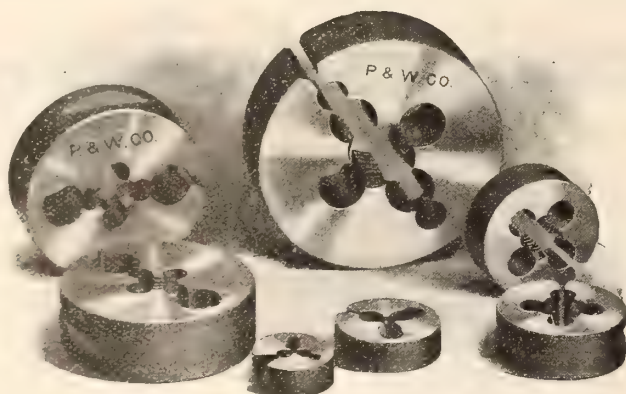
Designed Especially to handle pipes spaced closely as in coil work. No. 2½ wrench illustrated requires but three-quarter inch space between pipes.

Positive Grip instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

Ratchet-like Action. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

Can't Chew. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

Can't Crush. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.



MADE IN CANADA

Dies!

For All Kinds of Screw Cuttings

Reamers—Drills—Cutters
Taps

"THE GUARANTEED LINE"
Sold on Merit

Get Our No. 8 Catalogue

Pratt & Whitney Co. of Canada, Limited, Dundas, Ontario
Montreal Vancouver Winnipeg



Double Elliptic Street Car Springs with Cast Ends.

Railway Springs

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.
EQUALIZING, DRAWBAR, BUFFER AND SPIRAL SPRINGS of all kinds.

STREET RAILWAY SPRINGS, from the largest to the smallest.

TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE SANDERS, CHAIN, Etc.

Manufactured by

B. J. Coghlin Company, Limited
Montreal, Canada

Dominion Iron & Steel Co., Limited

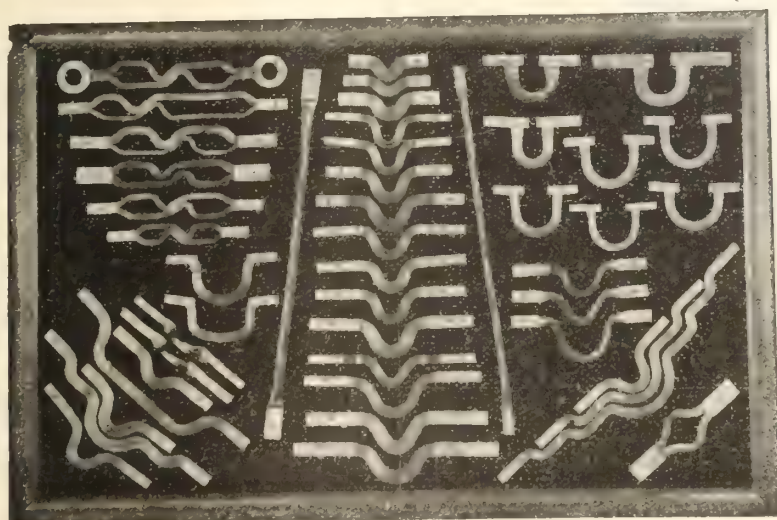
Manufacturers of

Basic Open Hearth Steel Rails

We will be pleased to have your enquiries for 1916 shipments

Head Offices
and Works

Sydney, Cape Breton, Canada



Electric Weld Rail Bonds

meet every condition.

Neither do they corrode
at the terminals.

The Electric Railway
Improvement Co.

Cleveland, Ohio

How Do You Buy Your Motor Brushes?

There is a wrong way and a right way to do nearly everything.

There is a right way of buying motor brushes.

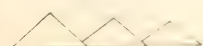
It consists in obtaining brushes best suited to the operating conditions of each individual motor.

We have a staff of brush engineers who can make proper recommendations.

We have a grade of brush to meet any stationary or railway motor operating condition.

Write for our brush data sheet.

Our Trade-Mark



See that your brushes
bear this stamp.

Canadian National Carbon Co., Limited

99 Paton Road, Toronto, Ont.

For Safety's Sake Specify-



Northern Electric "R. S. A." Wire

- ☐ Buying wire for railway signalling purposes on a price basis is a crime.
- ☐ Climatic conditions, especially in Canada, seriously affect the wire connecting the signals. Extremes of heat and cold, gases, acids, and oils are some of the many elements, that railway signal wire is subjected to and must combat.
- ☐ Northern Electric Railway Signal Wire stands the tests of time. It not only meets but exceeds the "R. S. A." Specifications. It is backed by the largest makers of wires and cables in the country, and sells on a quality instead of a price basis.

Northern Electric Company LIMITED

MONTREAL HALIFAX TORONTO WINNIPEG REGINA CALGARY VANCOUVER

ENAMELED IRON SIGNS

The ideal signs for
Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.

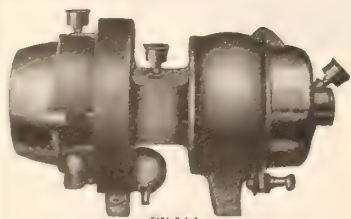
We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc,

Guaranteed not to
fade or be affected
by the weather in
any way.

Acton Burrows Limited

Enameled Iron Signs

70 Bond Street - Toronto



70 Schroeder Incandescent Headlights

In Service
270 days without any expense for repairs.
As a result of this exceptional service
150 more have just been ordered.

The HIRAM L. PIPER CO., Limited
MONTREAL, Sole Agents for Canada

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. BABBITTS. Miscellaneous Brass Castings for Railroads.

Works and Office: 69 Delorimier Avenue, MONTREAL, QUE.

Dominion Bridge Company, Limited

Head Office and Works,
MONTREAL, P.Q.

Branch Offices and Works,
TORONTO, OTTAWA and WINNIPEG



Lachine Bridge

Engineers, Manufacturers and Erectors of Steel Structures.
CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

Large Stock of Standard Structural Material at all Works.

We Sell

"Automatic" Car Ventilators

"Intake-and-Exhaust" and "Exhaust" types. Write for "Car Ventilation" booklet.

"Flower" Brush Holders

For all standard G. E. and Westinghouse motors; also Bushed Controller and Air Handles, D-Shaped, Steel Tubing, etc.

"Universal" Trolley Wheels and Harps

"Avco" Ball-and-Socket Strap Hangers
The kind that prevent strap breakage and save law-suits.

Automatic Ventilator Company

2 Rector Street

New York, N.Y.



A Clear Track To Promotion

How to get off the side track—how to break the couplings that hold them near the bottom of the pay roll—is the one big problem that troubles most railroaders.

There's a clear track to promotion—without grade or curve—open to the man that has the backbone and grit to take it. Before you can travel this track to promotion and bigger pay you must "coal up" with knowledge—you must be specially trained.

The Railway Instruction Department of the International Correspondence Schools is able and ready to give you the training you must have. You can get it right at home without losing an hour's time from your present job.

It will not cost anything to find out how the I.C.S. can train you for a better job. Put an "X" near the class of work you would like to follow, in the attached coupon, and mail it to the I.C.S. This won't obligate you in the least. It will simply bring full information by return mail.

Mark the Coupon NOW

International Correspondence Schools
Box 8404, Scranton, Pa.

Please explain, without obligation, how I can qualify for the position below which I mark X

Locomotive Engineer	Marine Engineer
Air-Brake Inspector	Oil Engineer
Air-Brake Repairman	Large Machine Engineer
R. R. Shop Foreman	Cosmetician
R. R. Traveling Engineer	Electric Engineer
R. R. Traveling Fireman	Electric Car Running
R. R. Construction Eng.	Electric Engineering
R. R. Accounting	Heavy Machinery
Bookkeeper	Telephone Engineering
Stenographer	Mechanical Engineering

Name _____

St. and No. _____

City _____

Present Occupation _____

Employed by _____



RUBBER HOSE

For more than fifty years we've been manufacturing Rubber Hose, and to-day, our brands are recognized as the standard by which Rubber Hose is judged.

We manufacture Hose for every use, including:

Steam Hose	Water Hose
Fire Hose	Oil Hose
Suction Hose	Dredging Hose
Garden Hose	Sand Blast Hose
Pneumatic Tool Hose	

If you are not getting the service you want from your Hose, let us show you what our brands will do.

Write Our Nearest Branch or Direct to the Head Office.

Canadian Consolidated Rubber Co., Limited
Montreal, P. Q.

28 "Service" Branches Throughout Canada.

Canadian Railway and Marine World

May, 1916.

Methods Adopted in the Construction of Rogers Pass Tunnel.

By J. G. Sullivan, M. Can. Soc. C. E., Chief Engineer, Western Lines, Canadian Pacific Ry.

The Rogers Pass tunnel is in the Selkirk Mountains of British Columbia. It is double tracked, five miles long, and as shown on figs. 1 and 2, lowers the summit of the former line by 552 ft. It also

so rapidly that it was evident that if the rate of increase continued, the road would have to be double tracked. A very prominent consulting engineer, who reported favorably on the proposal to con-

three times as fast as any long tunnel had been driven on this continent, and he had, in a superficial way, an idea of the methods employed. In a circular letter sent to contractors April 8, 1913, the fol-

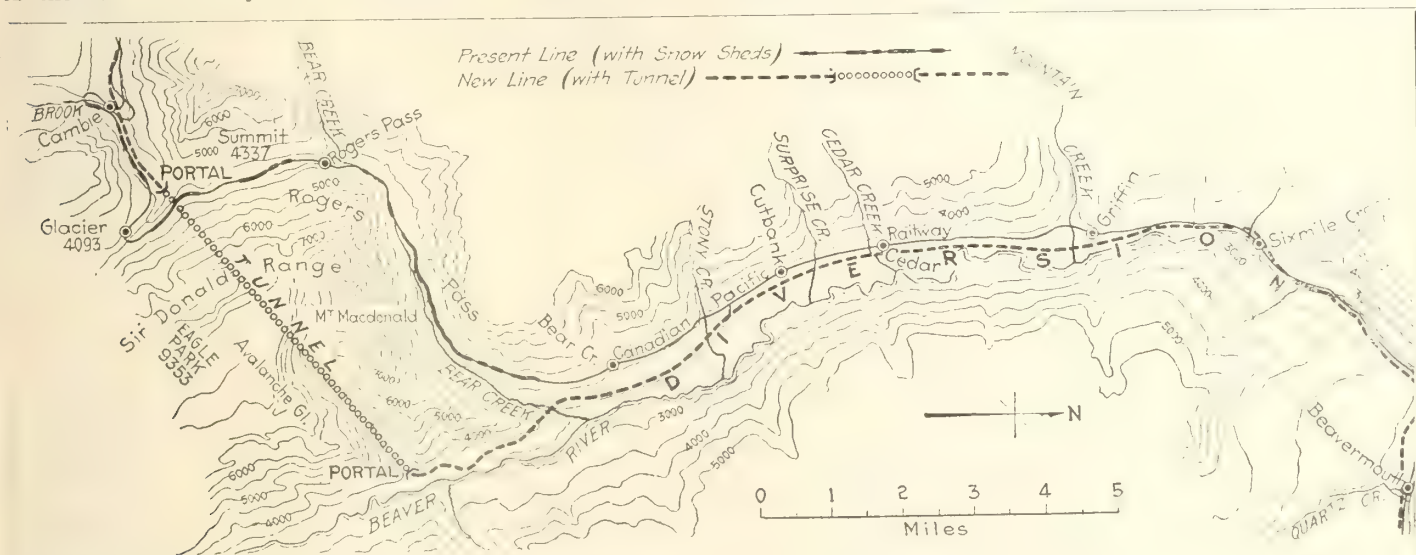


Fig. 1. Rogers Pass Tunnel. Map of Old and New Lines.

shortens the line by 4.3 miles, eliminates some 2,300 or 2,400 degrees of curvature and avoids the expense and danger of maintaining and operating 4.5 miles of snow sheds.

struct the tunnel, made a further suggestion that it might be necessary to double track the present line over the mountain and gauntlet the heavy bridges in order to handle the traffic during the

lowing statement appeared:—"The necessity for this tunnel is so great and the expenditure so large that it would be worth considerable money to this company to have the tunnel completed as

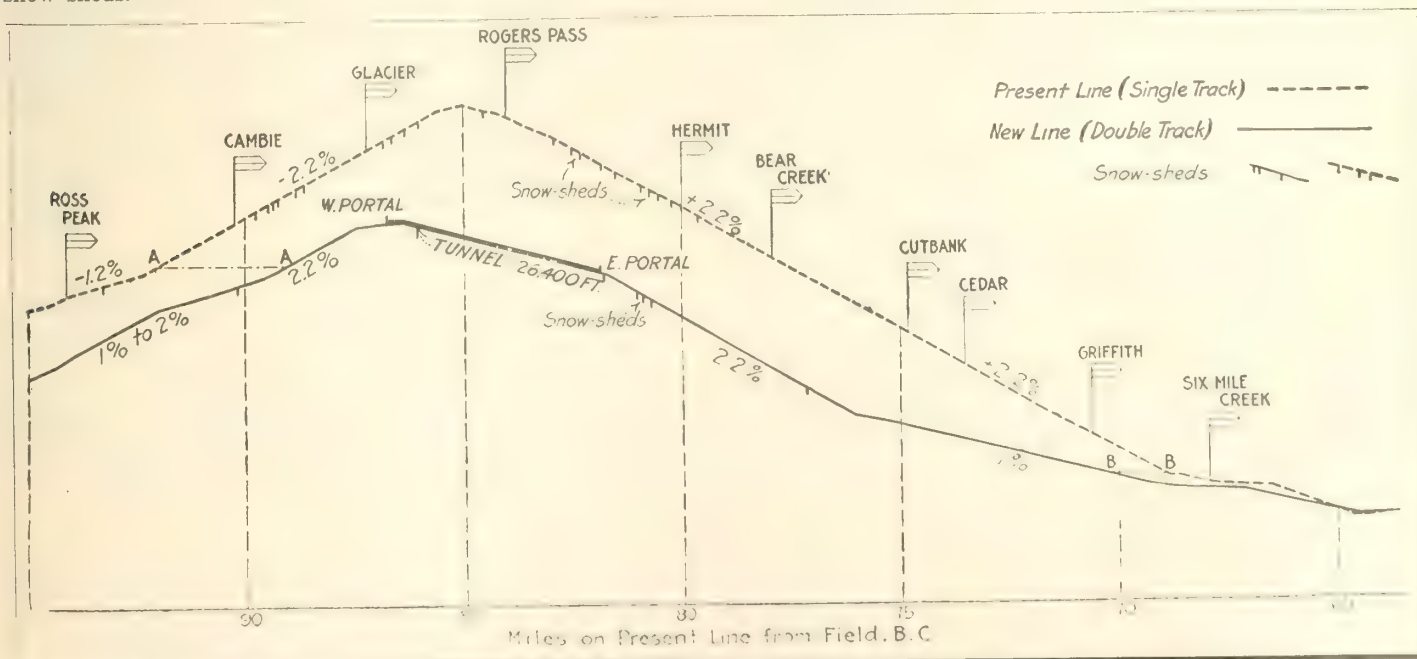


Fig. 2. Rogers Pass Tunnel. Profile of Old and New Lines.

In order that the plan adopted in the construction of this tunnel may be properly understood and appreciated, it is perhaps advisable to go somewhat into the history of the case. During the period from 1910 to 1913, C.P.R. traffic increased

period of construction. It can be readily understood, therefore, that the length of time required to complete the work became a matter of anxiety to the company. The author was aware that tunnels in Europe had been driven at a rate two or

soon as possible. Therefore, everything else being equal, the party who will guarantee completion in the shortest time will be the one who will receive the work. I would be glad if you would give us prices on the European method of tunnelling,

which is to drive a very small heading and take out the bench working from several headings into this small drift. Tunnels in Europe have been driven by this method at two or three times the speed that any tunnel was ever driven in the United States or Canada, and I would like to be able to place before the management figures for doing this work according to this method. I would be glad if you would state in your proposal the amount per day that you would be willing

been driven through the Alps. I have given the matter considerable study since and have come to the conclusion that the European method of driving a small lower heading and stoping out the remainder of the tunnel would be too expensive on this side on account of the difference in the cost of labor. I have been thinking out and studying methods that would tend to expedite this work. I first thought of driving a heading in the centre of the tunnel, about 9 ft. x 12 ft.,

have the proper credit for first suggesting a pioneer tunnel."

The sheets 1 and 2 referred to in this report are the accompanying figs. 3 and 4. These figures will serve to illustrate the methods which were adopted for the construction of the tunnel. A pioneer tunnel was driven entirely outside the regular section of the tunnel, and a centre heading was driven along the centre of the main tunnel. The functions of the pioneer tunnel were to provide a means of transporting the material from the heading to a point back of where the en-

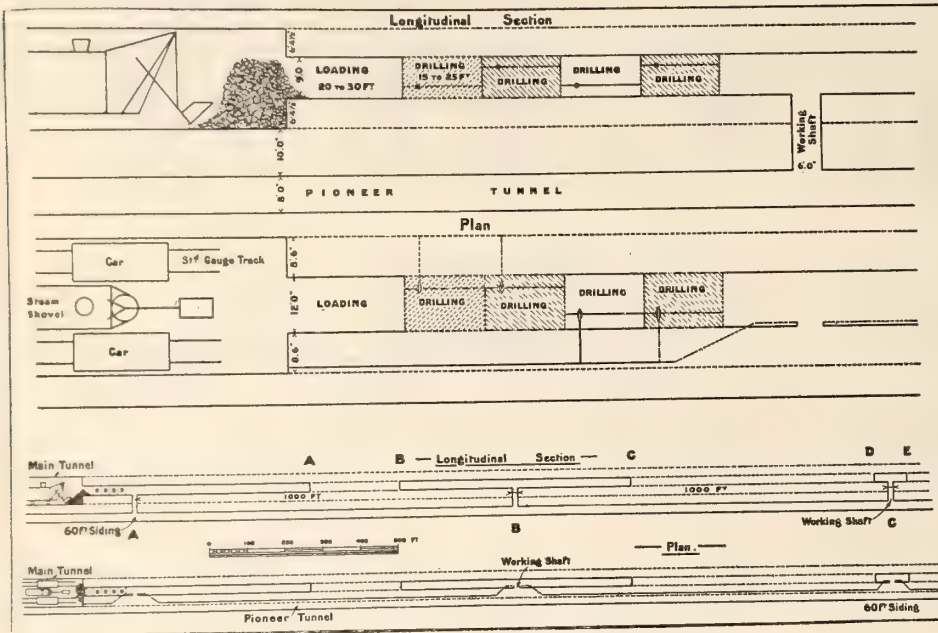


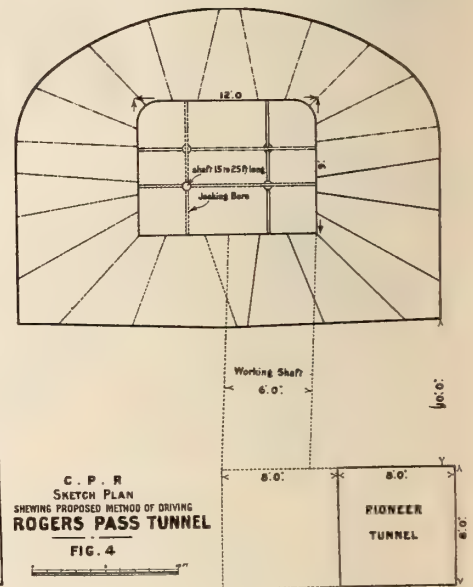
Fig. 3. Rogers Pass Tunnel. Proposed Method of Driving.

to have inserted in a contract to be paid as a bonus for time saved over the agreed time, the same amount to be exacted as a penalty for the time lost, being the time between the fixed day of completion and the actual date of completion. We are of the opinion that this should be about \$750 a day."

It was, however, considered unlikely that American contractors would tender at a reasonable figure on the European method, and after having studied some of

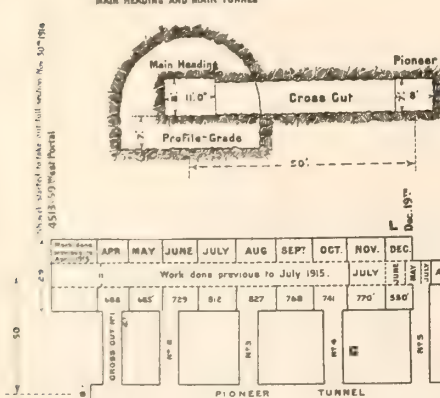
as is shown on sheet 1, and keeping this heading close to the bench, carrying the air pipes over the muck in front of the steam shovels. I pointed out to him that believe that this method in rock that will stand, is better than an upper heading. A. C. Dennis, however, suggested driving a pioneer tunnel and taking out an upper heading through shafts into this tunnel, taking out the rest of the bench with steamshovels. I pointed out to him that this was impracticable, for the reason

largement of the tunnel was being made, and to provide for the carrying of high pressure air pipes, water pipes, ventilating suction pipes, etc. In other words, to provide a means whereby the "shooting" at any one point in the tunnel would not interfere with operations at other points. In regard to the idea of carrying the drills on a horizontal shaft held in place by heavy jacks to enable these shafts and drills to be carried in narrow gauge tracks so that they could be moved backward and forward as required, it was



C. P. R.
SKETCH PLAN
SHOWING PROPOSED METHOD OF DRIVING
ROGERS PASS TUNNEL
FIG. 4

CROSS SECTION
SHOWING CROSS CUT, PIONEER
MAIN HEADING AND MAIN TUNNEL



ROGERS PASS TUNNEL

DIAGRAM SHOWING
MONTHLY PROGRESS.

FIG. 5.

that from an upper heading you cannot drill to the bottom of the tunnel, and therefore would have to clean up all the muck in the bench before you could put in a round of breast holes to break more rock. I have now made plans showing a combination of my ideas and Mr. Dennis', which I think is well worth studying. The plan is to drive a small working pioneer tunnel, 8 x 8 ft. underneath the main tunnel. I am sending you this for your information, and further, if this method should be adopted, that Mr. Dennis may

supposed that heavy drills, such as have been used in the past, would be required, but it was found that the Leyner drills actually used were so light that they could be operated by one man. The result has been that all drilling in the enlargement has been done from vertical shafts as shown in figs. 6 and 7.

Fig. 5 is a progress diagram, and shows the condition of the work to Dec. 19, 1915. The pioneer tunnel at the east end was located 50 ft. to the north of the centre line of the main tunnel. The mode of

the prices paid for labor on certain large Swiss and Italian tunnels, the author was forced to the conclusion that the same methods were not practicable in this country, where labor is so expensive. On Mar. 13, 1913, he reported his ideas on the subject to the company in the following terms:—"Referring to the progress that we hope to make in the driving of Rogers Pass tunnel. I advised you in my report of Oct. 22 regarding the relative speeds of driving tunnels on the American continent compared with those that have

operation was as follows: drilling in the small headings was done in the usual manner, using in general Leyner drills, making an advance of 6 or 7 ft. for each round of holes. The muck was shovelled by hand from steel plates into "half yard" cars and hauled back, either by a mule or small compressed air locomotive. The latter was used entirely when the haul had reached a considerable distance. The muck from the headings A and B on the progress diagram was carried out through the cross cuts E and D respectively into the pioneer tunnel, where it was carried back to cross cut C, and then out on a trestle over the standard gauge tracks through the main tunnel, and dumped into standard gauge cars. The material was then removed to the fills, as was also the muck loaded by steam shovels in the enlargement. The muck from heading F on the west end was in a similar manner conveyed into the pioneer tunnel at cross cut H and back to the main tunnel in cross cut G, where it was dumped into

which would require immediate timbering. As there was some 1,660 ft. of such ground, the time limit of the contract was extended into June, 1917.

The work completed up to Dec. 19, 1915, was as follows:—19,610 ft. of pioneer tunnel, 24,612 ft. of centre heading, 1,660 ft. of earth tunnel, and 14,342 ft. of tunnel enlargement in rock. At the same date there remained to be driven:—288 ft. of centre heading, 10,398 ft. of tunnel enlargement. The best progress made in driving the pioneer tunnel heading was in Jan., 1915, when 932 ft. in the west heading were completed. The best record for a week in the enlargement was 267 ft., and for a month was for Aug., 1915, in which the enlarging was 827 ft. in the west end.

From April 1, 1915, to Dec. 15, 1915, 12,346 ft. of tunnel enlargement was made. This was during the time that the shovels were both working in rock and at a normal rate of speed. Such a rate would require only a little over seven

up the muck, thus making an advance of from 30 to 35 ft. The shooting was usually continued until the tunnel became so full of muck that no more could be done. The largest amount shot at one time was 84 ft. in 11 hours, which was the record for Nov. 20, 1915.

All expectations as to speed in the execution of the work have been more than realized. For rock tunnelling where the rock is of sufficient hardness to stand until the mucking has been completed, the method described can be most successfully worked, and a speed of three miles a year can be easily made at a much less cost than tunnels driven at the same speed by the European method. Furthermore, the practice of radial shooting has given a great deal less overbreak than would have resulted had the holes been drilled parallel to the axis of the tunnel.

The work was laid out and commenced under F. F. Busteed, M.Can.Soc.C.E., Engineer in Charge of Double Tracking, with J. W. Sheppard as Assitant Engin-

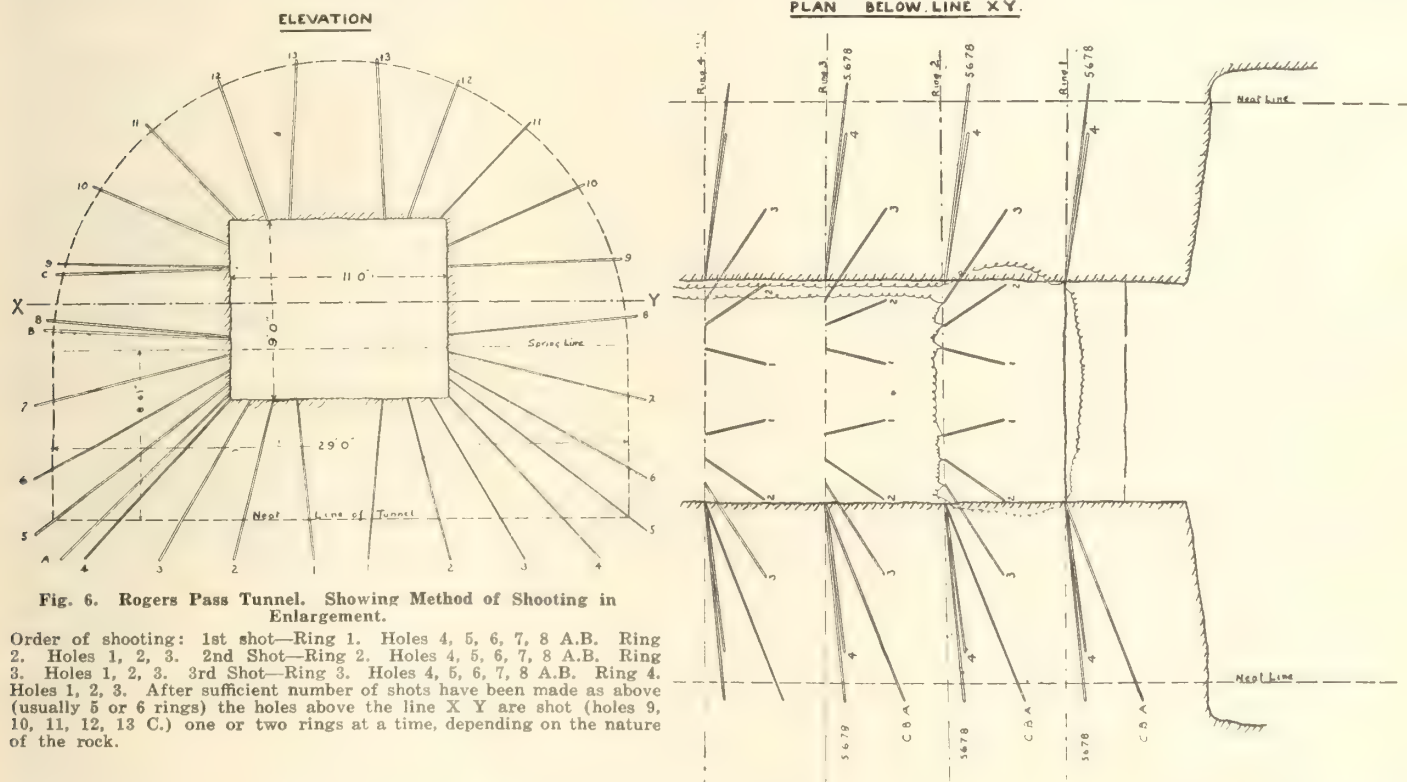


Fig. 6. Rogers Pass Tunnel. Showing Method of Shooting in Enlargement.

Order of shooting: 1st shot—Ring 1. Holes 4, 5, 6, 7, 8 A.B. Ring 2. Holes 1, 2, 3. 2nd Shot—Ring 2. Holes 4, 5, 6, 7, 8 A.B. Ring 3. Holes 1, 2, 3. 3rd Shot—Ring 3. Holes 4, 5, 6, 7, 8 A.B. Ring 4. Holes 1, 2, 3. After sufficient number of shots have been made as above (usually 5 or 6 rings) the holes above the line X Y are shot (holes 9, 10, 11, 12, 13 C.) one or two rings at a time, depending on the nature of the rock.

standard gauge cars. In the enlargement of the main tunnel the drilling was done well ahead of the shooting. Figs. 6 and 7 show the manner in which the drilling was carried out. The radial holes were at first drilled at right angles to the axis of the tunnel, but the results were not satisfactory, and a change was made, to the method shown in fig. 6, in which the holes have an inclination of about 1 in 4 from the direction in which the tunnel was being driven. The muck was all loaded by steam shovels into standard gauge 12 yard capacity dump cars. The shovels had dippers of 1½ cubic yards capacity and were worked by compressed air. The cars were hauled to the mouth of the tunnel by standard gauge compressed air locomotives and taken from there to the dumps by standard steam locomotives.

The contract for this work was let on July 1, 1913. The limit of time for completion was 3½ years, which would end on Jan. 1, 1917. There was an allowance in extension of time of one day for every ten feet of soft ground encountered,

months in which to complete the tunnel. There will, however, be some slowing up in the enlargement between cross cuts H and F, which are at the ends of the pioneer tunnels, for the reason that, at present, fans are installed at these points. Doors were placed at the cross cuts between the pioneer and the centre heading, and those which were at the back of the shovel were kept closed. When shooting occurred in the enlargement, the door at the first cross cut beyond the point of shooting was opened and a strong draught was thus created over the pile of freshly shot muck, making it possible for the men to return to work in 10 or 15 minutes after a shot had been fired. The methods employed in shooting in the enlargement were as follows:—One round of holes was shot at a time, the holes in the bottom of the tunnel being shot in advance of the holes on the sides or on top (see fig. 6). In some cases the top holes were not shot until all the bottom holes were finished. Usually 6 or 7 rounds of holes were shot before the steam shovel began to take

eer. It has recently been under the supervision of W. A. James, M.Can.Soc.C.E., Engineer of Construction, Western Lines, with H. C. Barber as Assitant Engineer, T. Martin, Resident Engineer at the west end and J. R. C. Macredie, M.Can.Soc.C.E., Resident Engineer at the east end. The contractors are Foley Bros., Welch & Stewart. The construction work has been supervised for the contractors by A. C. Dennis, M.Can.Soc.C.E.

The foregoing paper was read before the Canadian Society of Civil Engineers recently.

Canadian Society of Civil Engineers.—At the regular monthly meeting in Montreal, April 13, John Murphy, chairman of the Ottawa Branch, gave an informal talk, illustrated by views, describing his trip over the Panama Canal, and referring particularly to the difficulties of earth slides in the Culebra Cut. Lt.-Col. F. A. Snyder described an original diagram for making military scales for interpolation of contours and reduction and enlargement of maps.

Birthdays of Transportation Men in May.

Many happy returns of the day to:—
Jas. Bain, General Superintendent, Halifax & South Western Ry., Bridge-water, N.S., born at Pictou, N.S., May 24, 1860.

W. R. Baker, Secretary, and Assistant to President, C.P.R., Montreal, born at York, Eng., May 25, 1852.

B. T. Chappell, Superintendent, Pacific Division, Canadian Northern Ry., Vancouver, B.C., born at Charlottetown, P.E. I., May 1, 1878.

W. G. Connolly, City Passenger and Ticket Agent, C.P.R., Vancouver, B.C., born at McAdam Jct., N.B., May 28, 1889.

M. Donaldson, M.Can.Soc.C.E., Vice

M. A. Fullington, A.M.Can.Soc.C.E., Superintendent, District 3, Eastern Division, C.P.R., Montreal, born at Johnson, Vt., May 12, 1880.

Edward Garrett, Superintendent, Park and River Division, International Ry., Niagara Falls, Ont., born at Cataraqui, Ont., May 24, 1868.

G. E. Graham, General Manager, Dominion Atlantic Ry., Kentville, N.S., born May, 1870.

J. Graham, Roadmaster, C.P.R., Nelson, B.C., born in Ontario, May 22, 1870.

G. H. Hedge, General Master Mechanic, Western Lines, Canadian Northern Ry., Winnipeg, born at Neath, Wales, May 26, 1865.

W. T. Huggan, Divisional Accountant and District Passenger Agent, Prince Edward Island Ry., Charlottetown, P.E.I., born at Halifax, N.S., May 24, 1851.

J. Irwin, Superintendent, Toronto District, Ontario Division, Canadian Northern Ry., born at Clinton, Ont., May 28, 1866.

S. McElroy, Trainmaster, Canadian Northern Ry., Rainy River, Ont., born at Lindsay, Ont., May 1, 1875.

W. Marshall, Assistant Manager of Telegraphs, C.P.R., Winnipeg, born at Garden Island, Ont., May 18, 1859.

J. N. Murphy, Trainmaster, C.P.R., Medicine Hat, Alta., born at Mooretown, Ont., May 10, 1879.

W. J. Rooney, Divisional Superintendent of Telegraphs, Alberta and British Columbia Lines, Grand Trunk Pacific Ry., Edmonton, Alta., born at Toronto, May 22, 1882.

A. C. Shaw, Passenger Department, C.P.R., Montreal, born at Detroit, Mich., May 12, 1865.

W. Stapleton, District Passenger Agent, Canadian Northern Ry., Saskatoon, Sask., born at Bristol, Eng., May 20, 1884.

E. Tiffin, General Western Agent, Canadian Government Railways, Toronto, born at Hamilton, Ont., May 5, 1849.

J. H. Walsh, General Manager, Quebec Central Ry., Sherbrooke, Que., born at Quebec, May 12, 1860.

H. K. Wicksteed, B.A.Sc., M.Can.Soc.C.E., Chief Engineer of Surveys, Mackenzie, Mann & Co., Ltd., Toronto, born at Quebec, May 25, 1855.

James Yeo, ex-Roadmaster, Intercolonial Ry., Riviere du Loup, Que., born at Bideford, Devonshire, Eng., May 1, 1830.

The Traveling Engineers' Association will hold its annual convention at Chicago, Ill., Sept 5 to 8, when discussions will take place on the following subjects: the effect of mechanical firing and lubricating of locomotives on the cost of operation; advantages of super-heater brick arches and other modern appliances on large locomotives especially those of the Mallet type; prevention of dense black smoke and its relation to the cost of fuel and locomotive repairs; make up and handling of modern freight trains on level and steep grades to avoid damage to draft rigging; and assignment of power from standpoints of efficient service and economy in fuel and maintenance. W. O. Thompson, N.Y.C.R. Carshops, East Buffalo, N.Y., is Secretary.

British Railway War Traffic.—Fifteen thousand special trains have been run over the London & South Western Ry. during the past year in connection with movements of troops. This was independent of the large number of trains for soldiers on leave, many trains run in connection with troop movements, and 2,500 ambulance trains.

ROGERS PASS TUNNEL.
Half section of main tunnel and centre heading, showing ring column and drill setting for ring drilling.
(See page 171.)

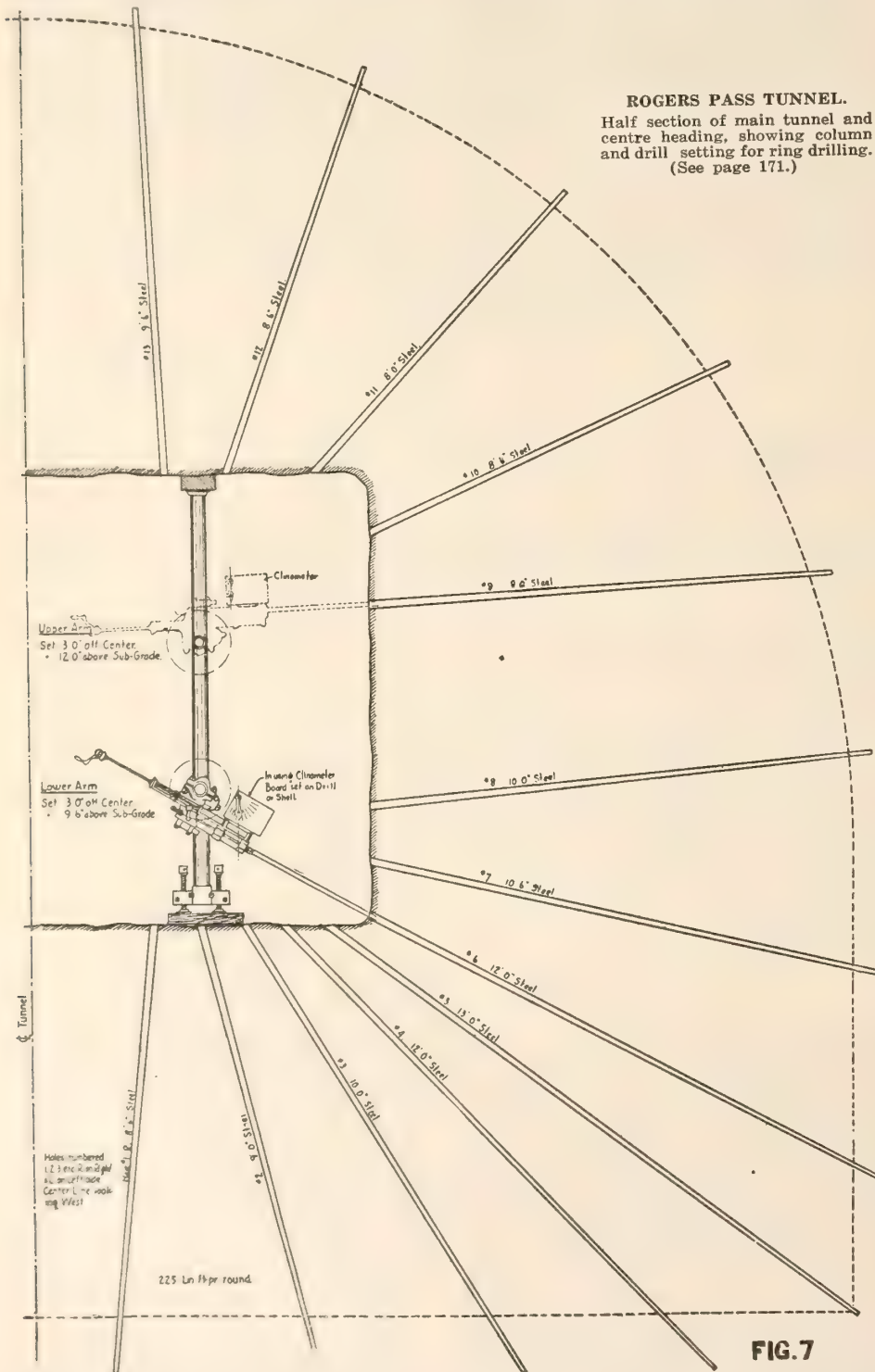


FIG. 7

B. A. Bourgeois, Assistant to Comptroller, and Treasurer, Canadian Government Railways, Moncton, N.B., born there May 24, 1869.

G. S. Cantlie, ex-General Superintendent, Car Service, C.P.R., Montreal, now in military service with Canadian Overseas Forces, born at Montreal, May 2, 1867.

President and General Manager, Grand Trunk Pacific Ry., Winnipeg, born near Edinburgh, Scotland, May 1, 1851.

A. E. Duff, ex-District Passenger Agent, G.T.R., Toronto, now of Winnipeg, born at Sherbrooke, Que., May 1, 1872.

G. C. Dunn, Division Engineer, Grand Trunk Pacific Ry., Winnipeg, born at Quebec, May 13, 1862.

Freight Cars for Paris, Lyons and Mediterranean Railway.

The Paris, Lyons & Mediterranean Ry. operates more than 6,000 miles of line, extending from Paris through Lyons, Marseilles and Monte Carlo to Ventimille on the Italian border, with a branch line running east from Macon to the Swiss frontier, making a direct route to Geneva. The National Steel Car Co., Ltd., Hamilton, Ont., has an order for 4,000 cars for this line and which represent a standard design of car as employed in the past for general freight traffic, yet being of a type especially adapted for military purposes, having a registered capacity of either 40 men or 18 horses in this service. The cars are of 20 tons capacity, weighing approximately 25,000 lbs. when empty, with the following general dimensions:

Length over buffers.....	28 ft. 6 ins.
Length over end sills.....	23 ft. 10 ins.
Length inside.....	23 ft. 7 1/2 ins.
Width over side sheathing.....	8 ft. 9 1/2 ins.
Width inside.....	8 ft. 7 ins.
Height over body roof.....	12 ft. 2 ins.
Height inside.....	8 ft. 1 in.
Gauge.....	4 ft. 8 1/2 ins.

pulling strains. A centre draw hook is connected up to the ends of the combination draft and buffing springs through suitable castings. The whole of the underframe is covered with flooring 1 9/16 in. thick by approximately 8 1/2 in. width of face.

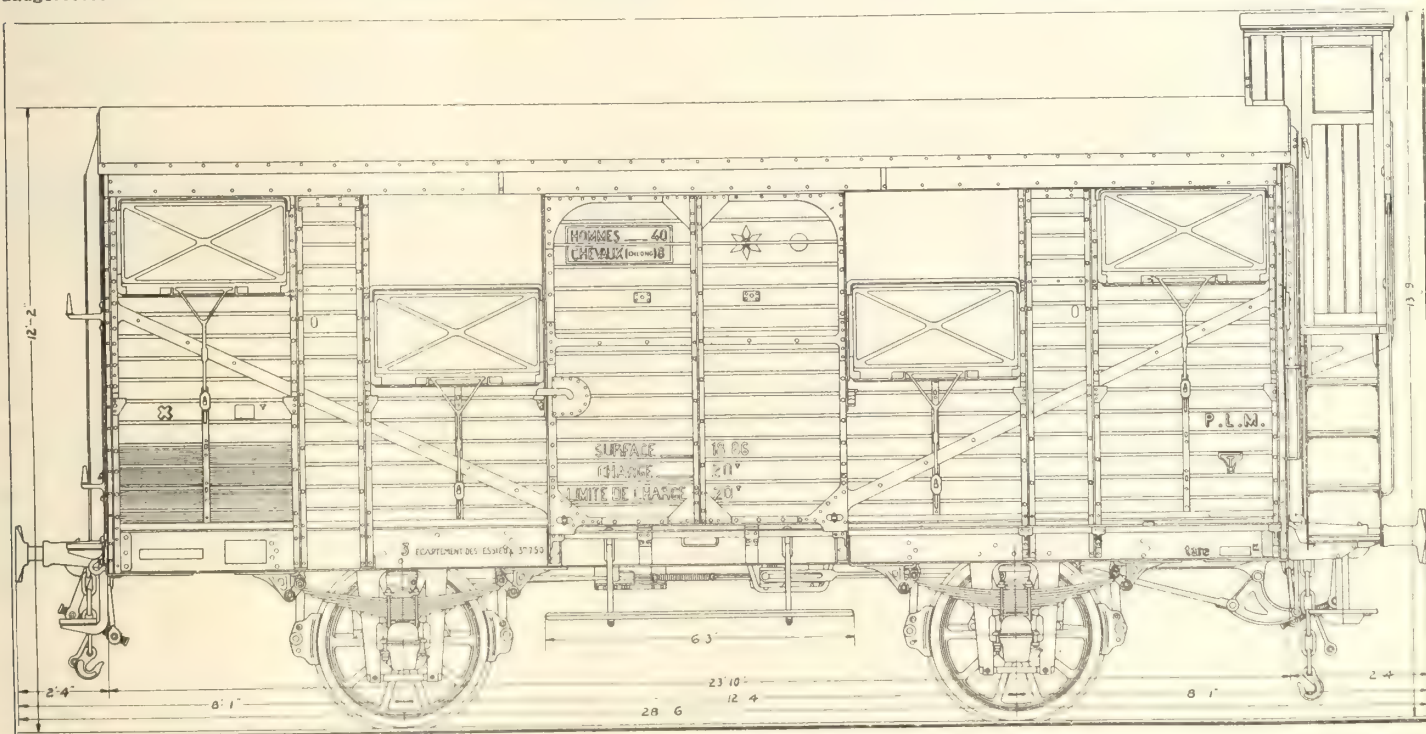
The superstructure embodies the use of six side post tees, 4 x 4 x 5/16 in., to 3/8 in., each side and two door post angles 3 x 3 x 3/8 in. The lower ends of these posts are rivetted to steel strap brackets projecting from the pedestal sills.

The upper ends are tied by side plate of 2 1/2 x 1 1/4 x 5/16 in. angle, which is reinforced above the door opening by a plate 6 in. wide and 5/16 in. thick. The side posts are also tied by a diagonal steel strap brace 3 in. wide x 5/16 in. thick, extending below the shutter openings from the side post at end to the door post. The two end posts at each end of car are of special I section 4 in. high, with one flange 3 1/4 in. wide and the other

ing 4 in. beyond the side sheathing.

The brake equipment is hand operated and of high capacity screw actuated type, on account of the fact that in train operation employees are only stationed on a few cars, which have to do all the braking for the train. A cabin, projecting 18 in. above the body roof and approximately 27 1/2 in. beyond the end sheathing is located at one end of the car to receive the brake wheel, same being connected up to a shaft through gearing and delivering a braking force equivalent to 163% of the loaded weight of car. Steps are provided leading up to a door on each side. Windows are located on all four sides. There are two hinged seats inside, fitted with counter weights to keep them in a upright position when not in use.

All structural steel parts receive one coat of red lead on contact surfaces when assembling and one general coat of red lead after assembling, which, with a final coat of black, comprises the finish. The



Paris, Lyons & Mediterranean Railway Freight Car.

The general construction throughout is the usual composite type employed on the European continent and embodies the use of 4 wheels forming a rigid wheel base of 12 1-3 ft. The underframe is composed of a set of strong side sills and end sills, being firmly connected at the corners, forming a stiff panel frame, which sustains the lading and buffing shocks as a unit. The end sills and pedestal sills are of 10 in. rolled steel channels weighing 21.8 lbs. a foot; the four pedestal cross ties are only 7 in. deep, weighing 12.25 lbs. a foot. A single centre sill extends from cross-tie to cross-tie and is continued to the end sill by two pairs of 2 3/8 x 2 3/8 x 5/16 in. rolled steel angles, to which the draft rigging is connected. The upper pair of angles are rivetted in place, while the lower pair are bolted, in order to be removable to allow for the proper replacement of the semi-elliptic draft springs, which travel between the upper and lower pairs of angles, allowing the springs to function as a buffing element as well as taking

flange 1 1/4 in. wide, all being tied at the top by a rolled steel end plate 2 1/2 x 1 1/4 x 5/16 in., also by two diagonal steel strap braces 3 in. wide x 5/16 in. thick, the ends of which are connected to the end side post, through the angles, which are rivetted to the back of same, extending from top of end sill to end plate. There are 6 steel carlines of angle section, to which wood furrings are bolted. These are supplemented by 9 wooden carlines and covered with a layer of white pine boards, over which is spread a layer of canvas. The sides and ends are sheathed with yellow pine and the flooring throughout is oak for half the cars and yellow pine for the remainder. Four shutter openings are provided in each side of the car, size 3 1/2 ft. x 21 in. high. The side doors are designed to roll on trucks of angle iron section, whereas the shutters slide up and down between guides on the side posts. The shutter and door openings are protected at the top by a 3/32 in. pressed steel plate running the full length of side and project-

brake and running gear and all detachable metallic parts receive two coats of black paint. The entire surface of woodwork, inside and outside, receives one coat of red oxide of iron before assembling, another coat of same after assembling and final finishing coat of red, all lettering and stencilling being in white. Roof canvas is soaked in linseed oil, then applied to roof, and when dry it receives two coats of black paint.

A Maine Railway Story.—One of Canadian Railway and Marine World's esteemed subscribers, a well known railway civil engineer, has sent in the following story which he heard in Maine recently. When a certain railway was about to build a branch line to the north part of the state, it solicited bonuses from farmers along the line in the shape of right of way. One enthusiastic farmer said that he would either grade a mile of the line or give \$1,000. The railway accepted the money.

Railway Statistics for Year Ended June 30, 1915.

The following summary of Canadian railway statistics for the year ended June 30, 1915, has been prepared by the Comptroller of Railway Statistics, J. L. Payne:

Mileage.—An addition of 4,787 miles was made for the year. This brought the total up to 35,582 miles. By 10 year periods, railway mileage has grown as follows:—

1865	2,240	1895	15,977
1875	4,804	1905	20,487
1885	10,773	1915	35,582

By provinces, the railway mileage for 1915, with the increases for the year, is shown in the following statement:—

	Miles.	Increase.
Nova Scotia	1,367	2
Prince Edward Island	275	...
New Brunswick	1,962	123
Quebec	4,677	634
Ontario	10,703	1,448
Manitoba	4,898	422
Saskatchewan	5,327	238
Alberta	3,174	629
British Columbia	3,000	1,122
Yukon	102	...

In the United States	398	173
Total	35,582	4,787

There was a decrease in Prince Edward Island of 4 miles. The mileage in the United States relates to lines which merely form operating connections between points in Canada—like the Canadian Pacific short line across Maine.

There were on June 30, 1915, 1,593 miles of line actually under construction, apart from surveys and projections.

The addition to double track in 1915 was 158 miles, bringing up the total to 2,451 miles. Yard track and sidings increased 335 miles, making the aggregate 7,852. The total of all tracks was 45,885 miles.

Capitalization.—An increase of \$66,990,127 in railway capitalization for 1915 brought the total up to \$1,875,810,888, made up as follows:—Stocks, \$847,801,101; consolidated debenture stock (C.P.R.), \$176,284,882; bonds, \$851,724,905. There were also stocks to the amount of \$29,257,500 and bonds for \$52,224,004 outstanding against lines under construction. Dividend on stocks in 1915 amounted to \$32,341,337, against \$30,434,601 for 1914. Government owned and operated lines, which are not capitalized, showed a cost of \$293,542,201.

Government Aid.—Cash subsidies amounted to \$5,059,284 in 1915, of which the Dominion contributed \$4,644,664 and the provinces \$414,620. The whole account for aid in cash, constructed lines, loans, etc., stood as follows on June 30:—

By the Dominion	\$ 183,479,193
By the provinces	37,437,895
By municipalities	17,914,836

Total

Land grants by the Dominion and Provinces totalled 43,929,312 acres up to June 30. Guarantees have been authorized as follows:—

Dominion	\$ 188,965,063
Manitoba	25,221,580
Alberta	59,410,450
Saskatchewan	41,625,000
Ontario	7,860,000
British Columbia	80,332,072
New Brunswick	6,063,000
Quebec	392,000

Total

Under these authorizations, bonds for \$350,622,918 had actually been executed on June 30.

Public Service.—There were 46,322,035 passengers carried in 1915, and 87,204,838 tons of freight. As compared with the preceding year, there was a decrease of 380,245 in the number of passengers, and 14,189,151 in the tons of freight. The

history of freight traffic growth is shown in the following statement:—

	Tons.		Tons.
1885	14,659,271	1905	50,893,957
1895	21,524,421	1915	87,204,838

Per mile of line there were 1,299 passengers carried in 1915, or 217 less than for 1914. Average receipts per passenger per mile were 2.021c—an advance of 0.014 over 1914. The average receipts per passenger from the sale of tickets were \$1.083, which fell short of the record for 1914 by 0.245c. The average number of passengers per train declined from 59 to 50; but the average number of passengers per car remained at 14. The average journey was 54 miles, or 12 miles lower than the figures for 1914.

The average receipts per ton of freight were \$1.520, against \$1.614 for the preceding year; the average receipts per ton per mile were 0.751 cent, or $\frac{3}{4}$ c, against 0.742 for 1914. Each mile of line yielded an average of 2,451 tons of freight traffic, 842 tons less than for 1914. The average load per train was 344 tons, with an average of 18.1 loaded cars per train. The average carload was 18.43 tons. The average haul was 212 miles, which happens to be the longest in any country.

Following is a statement of the various classes of freight, and the ratio which each class bore to the total:—

	Tons.	Per cent.
Products of agriculture	16,385,909	18.79
“ animals	3,356,657	3.75
“ mines	33,127,535	37.89
“ forest	13,976,555	16.03
Manufactures	12,586,393	14.76
Merchandise	5,272,163	6.04
Miscellaneous	2,393,123	2.74
Total	87,204,838	

During the year 22,134,118 tons were received from United States roads, or 25%, against 23,553,833 in 1914.

Earnings and Operating Expenses.—Gross earnings fell from \$243,083,539 in 1914 to \$199,843,072 in 1915. This decline of 17.8% was due to the disturbed conditions created by the European war, and came after a sustained upward movement in traffic and revenue. That movement may be measured by the following facts with respect to gross earnings:—

1885	\$32,227,469	1905	\$106,467,198
1895	46,785,486	1915	199,843,072

Operating expenses also decreased. The total of \$147,731,099 for 1915 was \$31,244,159 less than for 1914. This aggregate was equal to 73.9% of gross earnings. The difference between gross earnings and operating expenses—which is popularly, but erroneously, regarded as net earnings—was \$52,111,973, as compared with \$64,108,280 in the year preceding.

Gross earnings in 1914 and 1915 were realized from the following sources:—

	1914.	1915.
Passengers	\$ 62,012,296	\$ 50,173,267
Mails	2,500,176	3,026,773
Express	6,444,214	6,059,385
Baggage, parlor cars, etc.	1,607,517	1,440,509
Freight	165,753,731	132,543,984
Station and train privileges	1,044,737	936,268
Telegraphs, rents, etc.	3,720,868	3,718,366
Total	\$243,083,539	\$199,843,072

Railways had further gross earnings from outside operations, amounting in 1915 to \$20,332,306, which, after deducting operating cost, were reduced to \$6,273,794. There were still other sources of income, and these in 1915 produced a net of \$14,111,483. The final gross corporate income was \$72,497,250, as against \$82,134,694 in 1914. Gross earnings per mile of line in 1915 averaged \$5,616.41—

a decrease of \$2,277.19 for the year. The large addition to operating mileage in 1915—and new mileage is invariably low in earning power—had the effect of diluting many averages. Operating expenses were equal to \$4,151.57 per mile of line, compared with \$5,811.83 in 1914. Notwithstanding the heavy loss of gross earnings during the year, the returns show that Canadian railways made normal expenditures for the maintenance of roadbed and equipment.

Equipment.—Although there were additions to motive power and to cars in passenger service during 1915, there was an actual decrease of 2,500 in the number of cars available for freight service. It would seem that railways, after several years of unprecedented expansion in equipment, took advantage of the conditions prevailing in 1915 to cut out of commission a considerable number of old and much worn units.

Employees.—The extraordinary conditions of 1915 also had the effect of reducing the number of employees by 35,000—from 159,142 to 124,142. The salaries and wages bill declined from \$111,762,972 to \$90,215,727. There was no perceptible reduction, however, in the average rates of remuneration.

Accidents.—Railway operations resulted in 384 persons being killed and 3,161 injured. Of these, 360 were killed and 1,578 injured from the movement of trains. The record in this regard was as follows:—

	Killed.	Injured.
Passengers	17	304
Employees	102	946
Trespassers	168	147
Non-trespassers	73	167
Postal clerks, etc. ....	...	14
Total	360	1,578

One passenger in every 2,724,825 was killed, and one in every 140,369 was injured. This was an exceptionally good record. The toll at highway crossings was 66 killed and 112 injured, compared with 81 killed and 122 injured in 1914. The movement toward the protection of crossings progressed satisfactorily during the year.

Frictionless Rails.—The C.P.R. had about 500 tons of frictionless rails rolled by the Algoma Steel Corporation last year, which have been laid for trial purposes at a number of points, but particularly on the hill west of Galt, Ont.

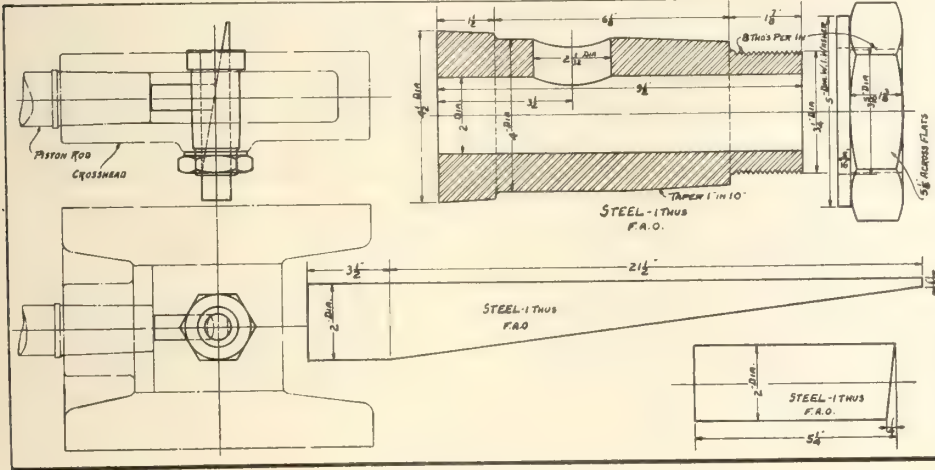
Restaurant Cars.—The Pennsylvania Rd. has discontinued the use of the name “dining car.” All its cars formerly called “dining cars” are now known as “restaurant cars.” In announcing the change, the Pennsylvania management states that the term “dining” is a misnomer, as the word “dining” properly applies to a place to eat dinner. As breakfast and luncheon, as well as dinner, are served in the so called “dining car,” it is actually a “restaurant car” and the Pennsylvania has taken the initiative on this continent in abolishing the misnomer and in giving its proper title.

Delaware, Lackawanna & Western Rd. Connection.—In the discussion on the extension of the charters for railways in the Niagara Peninsula of Ontario, controlled by Canadian Northern interests, the rumor has been revived that when the C.N.R. builds to the Niagara frontier it will connect with the D.L. & W. and thus secure direct connection with New York. The D.L. & W. mileage from Buffalo to New York is 411 miles.

Railway Mechanical Methods and Devices.

Vacuum Cleaner on Canadian Northern.

A useful and inexpensive type of portable vacuum cleaner as used by the Canadian Northern Ry. is shown in the accom-



Piston Rod Drift Pin.

panying plan. The ordinary shop or yard air line is employed to form a jet which causes a vacuum to be set up in the hose line connecting with the vacuum tip. The air jet is throttled by use of a 1 in. globe

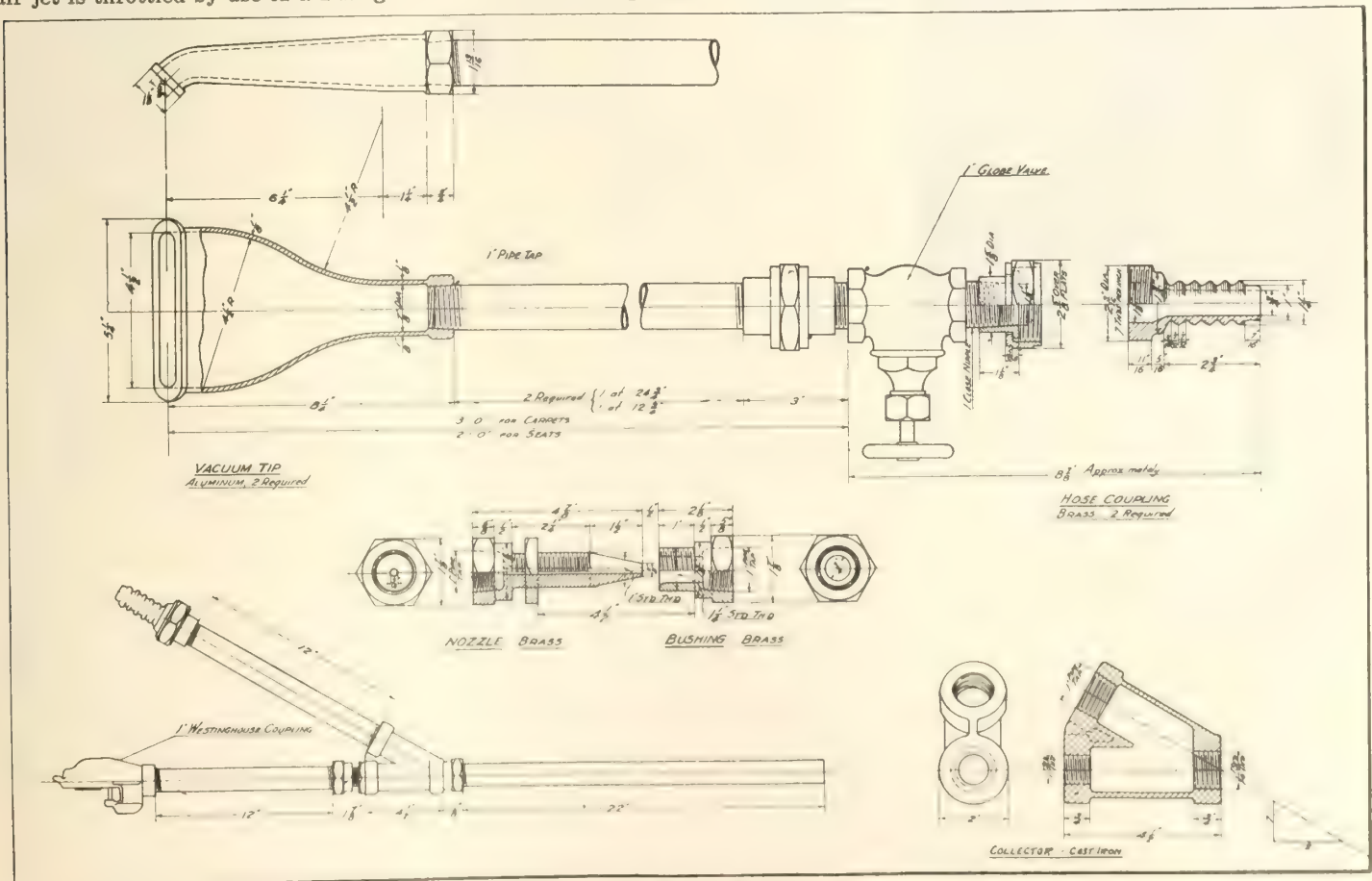
Piston Rod Drift Pin on Grand Trunk Pacific.

A practical type of shop kink for removing piston rods from crossheads, as used in the Grand Trunk Pacific shops at

thereby avoiding any damage to the motion work, and is bevelled to receive the sloping face of the wedge, which is inserted through the hollow shank of the wrist pin opening sleeve. The material used throughout is of common stock as regularly carried at the shops. We are indebted to W. W. Yeager, Locomotive Foreman G.T.P. at Biggar, Sask., for the foregoing information.

Machining Bushings in Grand Trunk Shops.

Bushings are machined in the G.T.R. shops, at Stratford, Ont., at one setting of the blank in the vertical boring mill. The method of operation is shown in the accompanying illustration. The bushing blank pattern is made about 1 in. longer at the lower end than the finished blank requires, and has four projecting pronged feet on which the blank sits and is bolted to the table or parallel strips as shown. It is first centred and held lightly in place by the three vise jaws, after which it is bolted down by the lug bolts. The heavy cut is then taken over the whole inside and outside surfaces, with the blank secured by both the vises and bolts. Following the heavy cut, the vise jaws are released, leaving to the lugs the holding of the blank, the final finishing cut then being taken. The object of doing this



Portable Vacuum Cleaner.

valve, located so as to be convenient of operation. Two lengths of cleaning outfits are employed, one for use of seats, etc., and the other for cleaning carpets and floors. The apparatus shown has already given more than two years satisfactory service.

the standard crosshead and is provided with a hollow tapered steel sleeve, which is fastened through the wrist pin opening in the crosshead by a 3/4 in. hexagon nut and plate washer. The sleeve is recessed to hold a 2 in. diameter driving block in line with the piston rod to be removed.

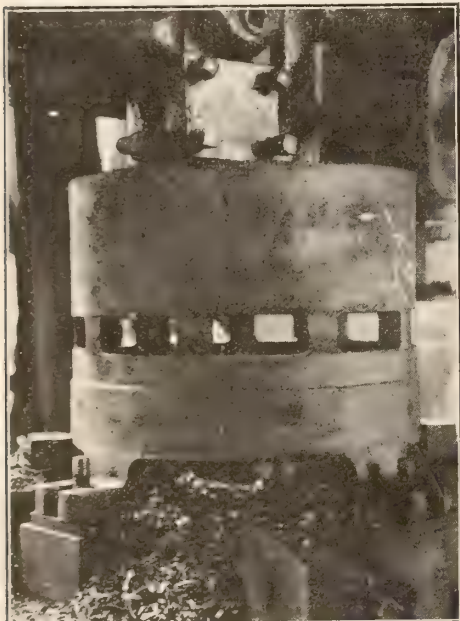
is to eliminate the springing strains set up in the blank by the compression caused by the vise jaws. A cutting off tool finally removes the bushing to the desired length, leaving about $\frac{1}{2}$ in. of waste stock attached to the bolting lugs.

The same system of lugged blanks is

employed for piston rings, the blank for the first cut being held both by the vises and bolts, and for the final cut, by the bolts alone. The rings are then severed by the cutting off tool. Bushings of different sizes are all handled in the same way.

Vise for Triple Valves, Canadian Pacific Railway.

J. Anthony, Air Brake Inspector, C.P.R., Winnipeg, has designed a vise for repairing and cleaning triple valves. Before it was used, it was customary to use an ordinary bench vise for the work. Owing to the irregular shape of the triple valve, it is only possible to grip it in a vise in certain positions; these are not the most advantageous for the work, and the new vise overcomes this difficulty. The arrangement consists of a special disc suited for each type of triple valve to which the triple is attached through the bolt holes in the flange by cotter pins. The disc is placed in the stand position of the



Machining Bushings from Blanks with Bolting Lugs.

vise and the stop pins dropped into position; the second position is attained by rotating the valve in the socket until pins drop into position 180 degrees from first place. The advantage is taken to raise height of triple so as to be most convenient for the operator. The introduction of these vises has made possible more output with less labor than before. We are indebted to E. T. Spidy, Shop Engineer, C.P.R., Winnipeg, for the foregoing information.

Rogers Pass Tunnel Progress.

The following table, for which we are indebted to J. G. Sullivan, M.Can.Soc.C.E., Chief Engineer, C.P.R., Winnipeg, shows the progress made from Feb. 26 to March 30, and the total progress to March 30:—

	Progress.	Total.
EAST END—		
Main tunnel	828 ft.	10,979 ft.
WEST END—		
Main tunnel	1,006 ft.	12,258 ft.

Canadian Railway Club.—At the monthly meeting in Montreal April 11, S. J. Sarjant, M.I.C.E., ex-Locomotive Superintendent, Great Indian Peninsula Ry., read a paper on the railways of India, which was illustrated by stereoptican views.

Report on Economics of Railway Location.

The American Railway Engineering Association's committee on economics of railway location, of which J. G. Sullivan, Chief Engineer, Western Lines, C.P.R., is chairman, and of which A. S. Going, Engineer of Construction, G.T.R., and A. C. Dennis, Superintendent for Foley Bros., Welch & Stewart, contractors, Rogers Pass tunnel, C.P.R. are members, has reported that it is not in shape to submit any conclusions or recommendations this year and therefore reports progress.

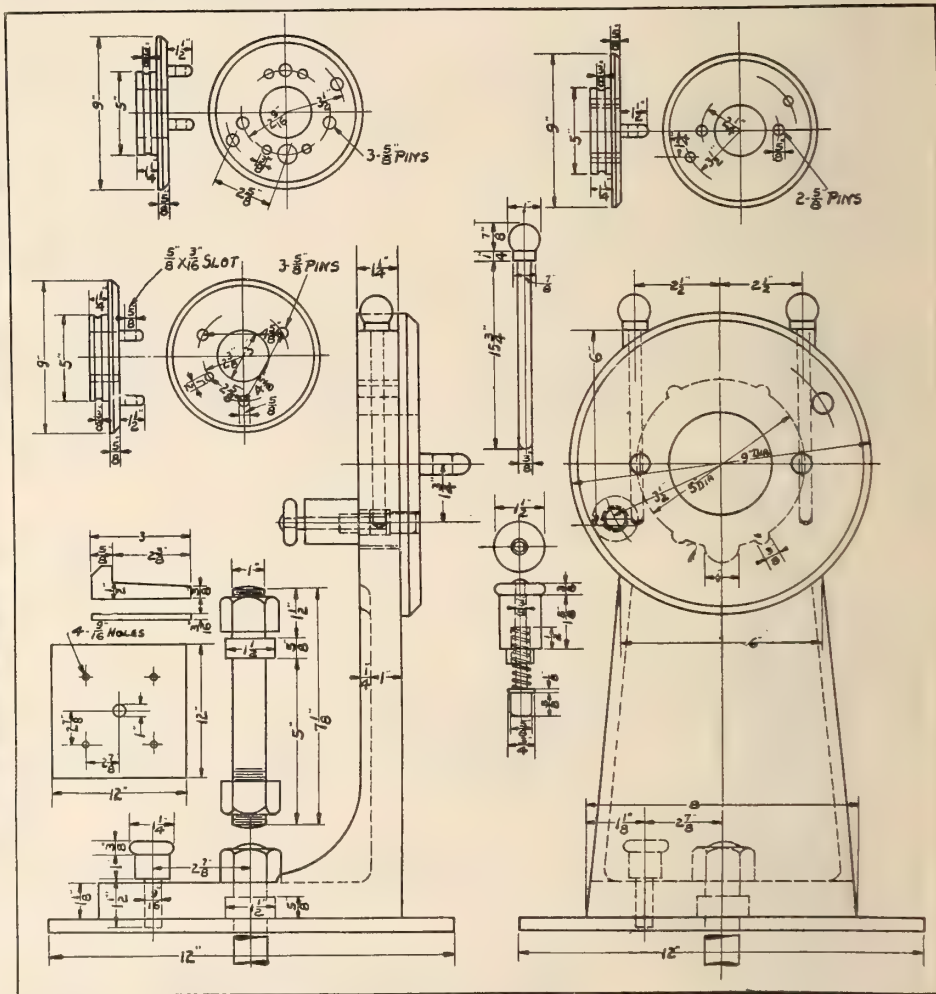
The report continues: "Sub-committee no. 4, under Prof. E. C. Schmidt, as

the amount of work done and the other varying with the locomotive miles run. As a result of these studies, the following formulae have been adopted for Western Lines.

"Single-Track Operation. — Fairly busy lines, 3.5 lbs. coal per calculated horsepower hour, plus 70 lbs. coal per engine miles run.

"Double-Track Operation.—3 lbs. coal per calculated horsepower hour, plus 60 lbs coal per engine miles run.

"The above figures are an average for the year, for conditions on the Western Lines, C.P.R., using locomotives equipped with superheaters, and having drawbar pull varying from 36,000 to 42,000 lbs. each. The calculated horsepower is the work done overcoming resistance."



Vise for Triple Valves.

chairman, did some work and sent out a circular, but is not in position at present to present information from which we can draw conclusions. Sub committee no. 5, under P. M. LaBach, chairman, made a study and submitted the result of freight locomotive tests on the Pennsylvania Lines, Logansport Division, made in 1912. This shows results for special conditions and is very instructive. It was thought advisable, however, not to publish this report at this time.

"The chairman of the committee made a careful study of the statistics of coal consumption in freight services on the Western Lines of the Canadian Pacific for the past eight years. These studies have convinced him that instead of attempting to base coal consumption directly on the amount of work done, that it is better to divide the coal into two factors, one varying directly with

Columbia & Western Ry. Land Grant Taxation.—Answering questions in the British Columbia Legislature recently, the Minister of Finance stated that the late F. A. Heinze's interests in the C. & W. R. subsidy lands were assessed at \$11,556 in each of years 1914, 1915 and 1916, but no taxes had been collected. The taxes for 1914 and 1915 were subject to 6% interest from the day they became delinquent, and the 1916 taxes were subject to a discount of 10% if paid before June. The solicitor for the Heinze estate had informed the Government that the taxes would be paid before the Government took any steps to advertise the lands for sale. The subsidy lands of the railway, now in the C.P.R.'s control, had been assessed at \$43,094.45 for 1912, but no taxes had been collected.

The G.T.R. handled 1,376,189 car loads of freight during 1915.

Spring and Summer Track Work.

By William Downey, Roadmaster, Minneapolis St. Paul and Sault Ste. Marie Ry.

All work should be authorized and mapped out before the spring work starts and estimates prepared of the cost. Every foreman should be given a certain allowance to spend on his section as should also the extra gang foreman. When the recapitulation sheet is made out at the end of the month each foreman should get a copy of it so that he can see how the cost of his work compares with other foremen's on the division. When there is any promotion in line, it should be given to the man who gives the best service.

The secret of handling work consists in selecting, organizing and training men and doing the right thing at the right time. A roadmaster should have a small extra gang to lay the rail, put in sidings and go over his division and do the work on sections where labor is scarce. He should pick out a good foreman for the gang, a man who is well posted on all kinds of track work and who is in line for position as roadmaster. When this crew is working at laying steel, or at other work, it is a good idea to put in two or three section forces with them. The roadmaster should be on the work as much as possible and give the foreman the benefit of his experience. He in time would train the section foremen and their men to carry out his instructions.

A section foreman should be allowed a force large enough to put in the ties, gauge, pick up and dress the track and burn the old ties between the time that the track dries out in the spring and the season of cold rains in the fall. This is the time he should devote to fixing up his track and he should not be allowed to take his force off of this work as long as any of it is left unfinished. Repairing fences, cleaning right of way and all other work should be done at other times. Using the section men for other work at this season is responsible for a great deal of rough track work.

A roadmaster should get what rail is required to take care of his division for the coming year, have it distributed and laid before the tie season commences so that when the new ties are put in, track picked up and gauged, it will not be necessary to tear up the track to lay the rail. An extra gang crew of about 25 to 30 men with the help of two or three section crews and the three man track laying machine will take care of all track laying on any division. The machine does away with 9 or 10 extra men and most of the heavy lifting.

All ties should be bought peeled, thus saving the section men the work of peeling and cleaning up the bark. It will also give the ties a better chance to dry out before they are put in the track while the cost of doing this work is naturally much less at the mills than on the section. The ties should be delivered by Feb. 1, which would force the lumber mills to turn them out before the sap gets up in the timber.

Ties should be distributed, placed and ready to be put in by the time the frost is out of the ground. Every tie that is to be removed from the track should be tested. This can be done by using a good lining bar and block, placing bar under the end of the tie, using it as a lever, or by using a pick under the end of the tie. Ties which raise the track by applying this leverage under them without breaking and have a good tie on each side of them, should be left in the track for another year.

When there are several poor ties at one place which are serviceable for but another year, some good ones should be put in so that all the ties do not give out at the same time. The foreman should go over his track as soon as the frost is out and tie up the places where the ties are the poorest and the track rough. As soon as the ground is dry and the weather hot, he should use two track jacks, picking up all low joints and rough spots and with the use of a spot board, bring all sags to grade. The ties should be slipped in without disturbing the old bed any more than is absolutely necessary and should be tamped while the work is going on so that each will have an equal gearing. This will help to prevent the rails from breaking in the winter.

In spiking, the gauge should be used in every case and each portion of the track put in perfect condition. If the old ties were spiked to gauge at the time they were put in, the inside row will still be in their proper place. By spiking the new ties to gauge, it will bring the rail tight against the inside row on the old ties and all that is necessary to be done is to pull those on the outside that are spread, plug the holes and drive them back in the same place. You will then have your track in gauge without any extra labor. If there is any place where gravel is needed to dress it up to standard, it should be unloaded at selected points so the section men can go back and finish this work.

The ditcher should clean out all ditches and widen all cuts to a standard. The material taken out should be used to widen the fills and should be unloaded with the Lidgerwood and side ploughs, one right and one left. The material should be cleaned out between the ties in cuts down to the under side and should be thrown out so that the ditcher can get it. The roadbed ought to be made to slope from the centre of the track to the ditch, about 1 in. to the foot.

A crew of sufficient force should then be started to raise the track to subgrade, using a 6 in. hanger on a spot board. If sufficient material is not obtained from the ditches to raise the track to subgrade and to widen it out to the standard, and if the ballast is not close by, a steam shovel can place in some other good material close by, using the poorest for widening the fill and the best for raising the track. The track should then be raised to subgrade and widened out to the standard width. Then the distribution of gravel should be started, working from the farthest end so as to make the longest haul first. This material should be unloaded with centre dump cars, unloading enough in a place for a 6 in. raise.

The track is now ready to be raised to grade with a uniform raise of 6 in. A crew of about 30 men and a water boy will be found economical. The spot board should be set upon the top of the grade stakes and the track raised, using 6 track jacks, 3 on a side. One man will raise the track for the crew while another will go ahead and dig the jack holes. Joint tampers can be dispensed with but let the track rest on the jacks until tamped. One man will carry the level board and space the ties. He will be followed by 24 tampers with 3 men to fill in the centres. Whatever ballast is required to fill it out to standard should be unloaded from flat cars with the Lidgerwood and side plough,

keeping the shaper set behind the plough so as to get the right amount of ballast unloaded. The best time to do this is when the surfacing gang is working between switches or in yards. While they are working on main line at these places the unloading crew can go by them on the passing tracks or sidings and when working on the sidings they can go by on the main line without causing any delay to themselves or the surfacing gang. By this method, the material can be unloaded in proper place and the dump line be kept as straight as the rail without any push car work or other expense in moving material. The section men should keep after their track, picking up low places and rough spots, until it is thoroughly settled in perfect grade and surface and then dress it down to a standard. Tracks should not be dressed and surplus gravel removed until it is thoroughly settled and up to grade and surface. If work is handled in this way, whenever you decide to put in rock ballast, or something better than what you have been using, you do not have to make any changes in your roadbed or waste any of the material and labor that you have been using.

Places in the track which heave a great deal each winter should be marked and during the summer holes should be bored from 3 to 4 ft. deep or below the frost line, and filled with cinders. They should be drilled at the end of the ties and between them if there is much heaving. When the ground freezes the following winter and expands, much of the movement will be towards the holes filled with cinders, as they are not packed tightly, instead of forcing upwards and raising the track.

On roads that are not troubled with much snow and frost, it should be so arranged that all double tracks, passing tracks, house tracks and yards be laid in the winter, all ties loaded and distributed, engine wood unloaded and ice houses filled. This work could be taken care of by the section men thus keeping a regular force busy during the entire year. None of the men would have to be laid off in the fall and the trouble with green men in the spring would be overcome.

Canadian Ticket Agents' Association.—

E. de la Hooke, Secretary-Treasurer, has issued a circular outlining arrangements for the annual outing and business meeting which will be held at Port Arthur, Ont. The eastern members will leave Sarnia, Ont., on June 10 at 4 p.m., on a Northern Navigation Co.'s steamship, arriving at Port Arthur early on June 12. They will stay at the Canadian Northern Ry. hotel, the Prince Arthur, and will be given an automobile ride round Port Arthur and Fort William by the Port Arthur City Council and Board of Trade and a steamboat trip round the harbor, and the Canadian Northern will take them by special train to Kakabeka Falls. Port Arthur will be left on June 14 at 8 a.m. by C.P.R. steamship. A short stop will be made at Sault Ste. Marie, and Port McNicoll should be reached on June 16 about 8 a.m., whence a special train will take them to Toronto. Members preferring to make the whole trip by rail may do so. The transportation companies will provide free passage on both trains and steamships, the only charges being for meals and berths. On sleeping car berths there will be a reduction of 50.

The G.T.R. has supplied, at the request of the British military authorities, a series of motion pictures of Canadian scenery and industries, for use in France and Belgium, at the military rest camps.

Canadian Northern Railway Construction, Betterments, Etc.

Canadian Northern Ontario Ry.—The agreement, dated Oct. 1, 1915, entered into between the company and the C.P.R., respecting lines in North Toronto, and the use of the station being erected on Yonge St., has been ratified by the Dominion Parliament.

The Dominion Parliament has ratified an agreement between the Canadian Northern Ontario Ry and the Canadian Northern Ry. on the one hand, and the C.P.R. on the other, respecting the construction, maintenance and operation of a joint section, to connect the C.N.O.R. east of Current River, Ont., with the C.P.R., the operation of trains over the C.P.R. for about two miles, and a connection with the C.N.R. at Arthur St., Port Arthur, Ont. The agreement is to run for 20 years, and at the end of that time may be renewed for a term of 999 years in all from Oct. 1, 1915. The rental to be paid for existing properties of the C.P.R. is \$312 a month for land, \$73 a month for a specified piece of land on which tracks are to be built, and \$220 a month for existing improvements; for further improvements, a rental at the rate of 4½% on half the ascertained value of the land and the cost of improvements, payable monthly. The cost of putting in connections and crossover is to be borne by the C.N.O.Ry. and the C.N.R., the work being done by the C.P.R. One half of the cost of maintenance and operation of the joint lines is to be borne by the C.N. companies, together with the entire cost of the maintenance of crossover and connections, and the special interlocking apparatus and other protection appliances.

A press report states that the company proposes to start at once to extend the C.N.O.R. from the present terminus at Current River, to Stephen St., Port Arthur, which work includes a bridge over the Current River. In the agreement above referred to, there is a section providing that within 10 years the C.N.O.R. may withdraw in respect such piece of line as will make the eastern terminus of the joint lines at Stephen St. This report would indicate that the C.N.O.R. is about to build its own line within that area.

Canadian Northern Ry.—The Dominion Parliament has extended the time within which the company may build the projected line from near Grosse Isle on the Oak Point branch, northerly and westerly to Grand Rapids, with a branch to Sturgeon Bay, Man.

The company is applying to the Brandon, Man., City Council for permission to close a number of streets in the south end of the city.

The Minister of Railways for Saskatchewan, is reported to have said on April 10 that he was about to take up with the company the question of the work to be done in the province on the lines for which guaranteed bonds had been issued.

A press report states that the Premier of Saskatchewan has been informed by M. H. MacLeod, General Manager and Chief Engineer, Western Lines, that it is expected to lay 35 miles of steel on the extension of the Macrorie Branch westerly from Eston, this year.

Canadian Northern Pacific Ry.—Replying to questions in the British Columbia Legislature recently, the Minister of Finance stated that the province guaranteed the company's bonds for \$21,000,000. Of these guaranteed bonds, \$18,286,573 had been sold, realizing \$17,310,037.40,

which amount had been paid out to the company as the work progressed.

Vancouver Terminals.—The general plan for the station to be erected on the False Creek property, east of Main St., was tentatively approved by the Vancouver City Council's bridges and railway committee, April 4. Detail plans and estimates are being worked out. The City Engineer estimates that the station building will cost about \$1,050,000. The company was not required by its agreement with the city to submit plans for approval. It is expected a contract will be let for the foundation work within a few weeks. Referring to the plans, the Vancouver Province says:—

"The drawings presented show a structure of classical Doric design, 321 x 120 ft., of modern fireproof construction. Twelve Corinthian columns stand at intervals across the entire front. The centre portion of the proposed structure reaches to a height of 100 ft. from the ground, the tower proper being 96 ft. high. The ends of the building stand 64 ft. high, and the portions between the centre and the ends, 60 ft. high. These sections are three stories in height, and the ends and the centre portion are four stories high. The building is designed for white or grey stone. Many modern features are embodied in the interior design. A large main entrance is provided in the central portion through which a passage runs into a very wide lobby leading into the general waiting room, 150 x 50 ft. wide. In this are the ticket offices, etc. Adjacent to the ticket offices is the baggage room and on the opposite side of the building, with means of access from the waiting rooms, are the lunch and dining rooms. There are numerous lobbies off the waiting room. A barber shop is provided, a men's waiting room and a women's waiting room and retiring room; a government mail room and the dining and sleeping car department; C. N. Ex. Co. and commercial telegraphs. The upper stories are devoted to traffic offices. A passage-way leads from the waiting room to the train tracks at the back of the station. Here a large covered concourse is provided, 50 ft. wide and covered platforms from 1,200 to 1,500 ft. long. Provision is made for 16 tracks. The basement is to be utilized for storage purposes, etc. The floors throughout are of terrazzi and marble; the stairways are marble and the finish throughout is in natural wood."

Reply to a question in the Legislature as to the station building and terminals, the Minister of Railways said, April 8:—"The work has been proceeded with slowly, evidently from a desire to modify and revise the proposed works. This is a matter that is receiving very careful consideration before a final decision is arrived at. It appears probable that the work will not be further delayed. The filling in of the land surrounding the station at Vancouver will be started immediately, and as soon as the plans and specifications are completed, tenders will be called for at once, and it is hoped that the excavation and basement will be put in within six weeks."

Replying to questions in the Legislature, the Minister of Finance said recently that the proceeds of the \$8,614,000 of C.N.P.R. terminal bonds issued amounted to \$7,954,814.43, of which there had been expended to Dec. 31, 1915, at Port Mann,

\$360,331.60; New Westminster, \$1,376,361.15; Vancouver, \$330,249.80; Steveston, \$344,541.11; Patricia Bay, \$37,430.76; total, \$2,448,914.42. The government held drawbacks of \$37,436.74 on these accounts, making the amount at the credit of the account, \$5,543,336.75.

Lines on Victoria Island.—The Minister of Finance informed the B.C. Legislature recently that up to Feb. 10, the company had paid \$4,100,105 to contractors on the line from Victoria to Port Alberni, 136.50 miles. About 65% of the work had been completed and the government had paid out of the proceeds of the guaranteed bond issue, \$2,879,259, or 58%. An expenditure of \$861,294 will be required to complete the grading and bridging, and a total of \$1,380,662 to complete the line ready for operation as far as already graded. About six miles of grading is required to be done at the Victoria end. (April, pg. 145.)

Canadian Government Railways Rolling Stock.

The acting Minister of Railways, in discussing Departmental estimates for 1916-17 in the House of Commons recently, in referring to the condition of the rolling stock, said: "The sums which had been transferred to the three renewal accounts, viz.: \$600,000 to the renewal of equipment account, \$400,000 to the rail renewal account, and \$100,000 fire renewal account, will be used entirely for the providing of new equipment. At no time in the history of the Government Railways has new equipment been needed more than at the present time, owing to the fact that we have taken over 2,000 miles of railway on which there was very little, if any, equipment. During the past year new rolling stock has been delivered as follows:—

10 passenger locomotives and 15 consolidated locomotives, Canadian Locomotive Co.
250 steel gondola cars, Eastern Car Co.
250 flat cars, Nova Scotia Car Co.
6 first class steel cars, Canadian Car & Foundry Co.
6 baggage and postal cars, being built in Moncton shops are about 55 per cent. completed.
2 wrecking cranes and one steam shovel delivered.

The following amounts were set aside for renewal of equipment account: 1912-13, \$777,863.74; 1913-14, \$179,362.78; 1914-15, \$36,465.08; 1915-16, \$900,000. The following work had been done so far as repairs are concerned:—

	1913-14	1914-15	Increase	Decrease
Locomotives	173	392	119	
Freight cars	19,208	14,065		5,143
Passenger cars	472	505	33	

To organize the initial service on the National Transcontinental, there were transferred from the Intercolonial, 98 locomotives, 33 passenger cars and 1,000 freight cars. "We were able to transfer locomotives from the Intercolonial," said the acting Minister, "for the reason that during the dull times last winter we repaired all our Intercolonial locomotives, and were able at the opening of the National Transcontinental to utilize 95% of our power on the two railways. Ordinarily, 20% of the locomotives of a railway are out of commission for repairs or other causes. These locomotives, with the assistance of 13 rented from the G.T. Pacific, have enabled us to handle the grain situation as well as we have. In addition to this equipment loaned, much of which will be absorbed permanently by the National Transcontinental, we purchased 1,000 steel frame box cars, at a cost of \$1,095,000, which were delivered in September.

Traffic Orders by Board of Railway Commissioners.

Interchange Facilities at Moose Jaw.

24797. Mar. 16. Re application of Board of Trade of Moose Jaw, Sask., for an order directing the Grand Trunk Pacific Branch Lines Co. and the C.P.R. to install interchange tracks for inter-switching purposes at Moose Jaw, it is ordered that the G.T.P. Branch Lines Co. be directed to construct interchange tracks between its spur to the Government Elevator and the C.P.R. Outlook Branch at Moose Jaw, that detail plans showing the proposed interchange tracks be filed for the approval of an engineer of the Board within 30 days from date, the work to be completed by June 1, 1916; and that the question of the cost of constructing and maintaining the tracks be reserved to be disposed of at the next sittings of the Board in Moose Jaw.

Nanaimo Not Terminal Freight Rate Point.

24808 Mar. 18, the complaint of Nanaimo, B.C., Board of Trade against the proposed C.P.R. new tariff eliminating Nanaimo as a terminal freight rate point. It is ordered that the complaint be, and it is hereby, dismissed.

The Chief Railway Commissioner, Sir Henry Drayton gave the following judgment. Nanaimo for many years has had the benefit of coast terminal rates. This benefit has been taken from it. As the lower rate was of course entirely out of line and lower than rates fixed as reasonable for the service, the difficulty of ordering the company to restore the old rate was obvious. On the other hand, there is no doubt that more or less inconvenience and sometimes real hardship results from changes in rates; and judgment was reserved, so that the matter could be looked into with a view of ascertaining whether or not the Board could consistently order a restitution of the rate. I am unable to find any ground on which such an order could be based. The principle that a railway may meet water competition or not just as it pleases is of general acceptance and so well known that it need not be emphasized. If the railway does not choose to meet the water competition, the Board's whole right to interfere with the rate is confined to a case where the rate as charged is unreasonable for the service rendered. It is impossible to say such is here the fact. It appears that the C.P.R. for years maintained its car ferry at Ladysmith, giving Nanaimo terminal coast rates involving a rail movement from Ladysmith to Nanaimo of 14 miles without charge. The Ladysmith facility was not owned by the company, and in view of the transfer charges which were being exacted, the C.P.R. now runs its car ferry to Esquimalt. The rail haul from Esquimalt to Nanaimo is 69 miles. The result is that to give Nanaimo the benefit to the terminal rate, the Board must say that the C.P.R. shall carry Nanaimo shipments 69 miles for nothing. Of course, if the railway company was performing a similar service for nothing for a similar or considerable distance, the Board could order that Nanaimo should get the benefit of this 69 mile haul for nothing, on the ground of discrimination. Such is not the case, the only points enjoying terminal rates being Esquimalt and Victoria, and as Esquimalt, of course, adjoins Victoria, there is no discrimination; and no order can be made.

Specifications for Cheese Boxes.

24837. Mar. 28. Re order 24188, Sept. 18, 1915, approving Supplement 5 to Canadian Freight Classification 16, to become effective not later than Nov. 1, 1915, with the exception of the item on pg. 9 giving specifications for cheese boxes, which was to become effective not later than Dec. 1, 1915: It is ordered that the effective date of the said item be finally extended until Aug. 1, 1916. No further suspension will be permitted.

Minimum Weight for Lumber.

24840. Mar. 29. Re application of R. H. H. Alexander, Secretary-Treasurer, British Columbia Lumber & Shingle Manufacturers, Ltd., of Vancouver, B.C., and the Riverside Lumber Co., Ltd., and A. B. Cushing Lumber Company, Ltd., both of Calgary, Alta., for an order postponing the effective date of the increased minimum weight for fir, spruce, hemlock, and common cedar lumber, when loaded in cars under 36 ft. in length, from 30,000 to 35,000 lbs. per car, which, as appearing in C.P.R. Supplement 59 to its Tariff, C. R. C. W. 1806, was, on the application of the said Alexander, suspended until further order by order 24550, Dec. 13, 1915: It appearing that the said minimum weight has been republished by the C.P.R. in its Supplement 68 to Tariff C. R. C. W. 1806, so as to give the notice required by the Railway Act, and has been continued in Supplement 69 to the said tariff: It is ordered that the effective date of the said increased minimum weight be postponed until further order.

Interswitching at Chatham, Ont.

24868. April 5.—The complaint of N. H. Taylor and Canada Flour Mills Co. of Chatham, Ont., against the interswitching charge of 2c per 100 lbs. on grain, ex-lakes, milled in transit at Chatham: Upon hearing the complaint at Toronto, Feb. 22, the complainants and the C.P.R. being represented; upon the report of the Chief Traffic Officer of the Board, it is ordered that the complaint be dismissed.

Question of Rights at False Creek, Vancouver.—Champion & White are owners of a wharf on False Creek, Vancouver, where the Canadian Northern Pacific Ry. and the Great Northern Ry. are carrying out large reclamation works, under an agreement with the city. Part of this work consists of a seawall which is in course of erection by the Canadian Northern. An interim injunction to prohibit the building of the seawall was dissolved, some time ago, on the ground that it did not interfere with the carrying on of complainants' business, but in the action on the main question, Champion & White, who hold title under an old Crown grant, claim that they have riparian rights on the south side of their wharf, which they will be entirely cut off from by the seawall. This, the trial judge held to be the case, and an injunction was granted against the city. It is expected that while there will be an appeal, a settlement will be reached, under which the work will proceed on the understanding that arbitrated damages will be paid if the city is ultimately found to be liable.

British Soldiers and Railway Equipment Repair.—The British military authorities have released a number of soldiers to repair locomotives and cars, owing to the great number out of service for necessary repairs, which had caused congestion of traffic.

Railway Finance, Meetings, Etc.

Algoma Eastern Ry.—There have been deposited with the Secretary of State at Ottawa, and with the Provincial Secretary at Toronto, duplicates of contract and mortgage dated April 1, entered into between the company and the Algoma Rolling Stock Co., evidencing a sale of rolling stock, the mortgage securing the payment for the same being made to the National Trust Co.

Canadian Northern Ry.—A recent press report states that the company has secured \$2,500,000 in New York to retire a loan about to mature in London, Eng.

Diamond Coal Co.—Under an order of the Supreme Court of Alberta, this company's property was offered for sale by auction at Lethbridge, Alta., April 27, under proceedings instituted by the Trusts and Guarantee Co. The property offered includes the collieries opened, the coal lands, the mining plant, together with the rails, mining cars and electric hauling motor used in the collieries.

The Diamond Ry. & Coal Co. built a line in 1909 from Kipp, six miles west of Lethbridge, on the C.P.R., to Diamond City, where the Diamond Coal Co.'s first collieries were situated. In 1910, a number of sidings and spurs were built connecting up other collieries with the line. This railway does not appear to be included in the schedule of the property ordered to be sold.

Grand Trunk Ry.—The annual meeting was held in London, Eng., Apr. 18, when the report was presented and adopted. In reply to questions from shareholders as to the Dominion Government's intentions regarding the Grand Trunk Pacific Ry., the Chairman, A. W. Smithers, stated that he had put the company's case fully before the ministers when in Ottawa recently, and their reply was being awaited.

Minneapolis, St. Paul & Sault Ste. Marie Ry.—It was stated in New York, April 8, that \$6,000,000 of the company's bonds which were being transferred were part of a consignment of bonds mobilized by the British Government in Great Britain and sent over to the U. S. in connection with Imperial financial plans.

Morrissey, Fernie & Michel Ry.—The report for 1915, presented at the annual meeting at Toronto, Apr. 14, showed a profit from the year's operations, of \$17,932.83, which, with the balance brought forward from 1914, makes a credit to profit and loss, of \$61,419.88. The directors for the current year are: Elias Rogers, President and Treasurer; E. C. Whitney, Vice President; H. B. McGiverin, C. A. Thompson and W. H. Robinson. R. M. Young is Secretary.

Temiscouata Ry.—Earnings for January, \$17,123; operating expenses, \$14,635; net earnings, \$2,488. The net earnings for Jan., 1915, were \$2,969.

Treated Ties Save Growing Trees.—Of the 3,000,000 cross-ties used every year by the Chicago, Burlington & Quincy Rd. for replacement purposes, over 70% are treated with a preservative. According to the Superintendent of the company's wood preserving plant, the millions of treated ties in their tracks now last from 12 to 20 years, whereas untreated they last an average of eight years. In each of the 20 divisions of the Burlington system there are tracks for experimental purposes containing 26,000 treated ties of different species, which are all carefully inspected at least once a year for the actual results of treatment as shown by the service test.

Canadian Built Freight Cars for French State Railways.

The accompanying illustration shows the sample car built by the Eastern Car Co., New Glasgow, N.S., on an order for 1,000 4 wheel freight cars for the French State Railways, the contract for which was given in June, 1915, its execution having been held up owing to impossibility of getting material. It is however hoped to make shipments shortly. These cars are of material to C.P.R. specifications, with the exception of the screw coupling, drawbar hook and all springs, which are to a modified French specification suitable for American practice, especially regarding tests. All rolled shapes of American standard are inter-

Length over end sills.....23 ft. 11 $\frac{3}{4}$ ins.
Length inside.....21 ft. 7 $\frac{7}{8}$ ins.
Width inside.....8 ft. 2 $\frac{7}{16}$ ins.
Height from top of rail to top of cabin 11 ft. 4 $\frac{1}{2}$ ins.

Canadian Government Railways Mileage, Operation, Etc.

The acting Minister of Railways, in discussing the Department estimates for the current financial year in the House of Commons recently, said: The mileage of railways operated by the Government is as follows:—

Intercolonial Ry.	1,457
Prince Edward Island Ry.	272
National Transcontinental Ry., Moncton to Winnipeg	1,804
Lake Superior Branch, G.T.P.R.	188
New Brunswick & Prince Edward Island Ry.	36

traction, stronger bridges, and other facilities, if we could get an increased share of freight business, we could handle it successfully and make a much better showing. We have been able to get that extra business, and have been able to handle it with a very slight increase of cost in operation. To put it in concrete form, our gross earnings at the end of Dec. 1915, were increased by \$1,191,000, while the increase in working expenses was only \$43,000. Having given particulars of items in which economy had been made, the acting Minister gave the following statement of the operations of the I.R.C. for the year ended Mar. 31, the figures for Jan., Feb. and March being estimated:—

Actual earnings to Dec. 31, 1915...\$10,613,264.99
Estimated for Jan., Feb. and Mar.,



changeable with the French as far as possible, and the side end stakes and floor stringers are of French section. The siding, ending and sheathing for cabin is of yellow pine, and the floor and cabin framing of oak. The buffers are of cast steel, and the brake of the usual clamp type with counterweights operated from the cabin. Brakeshoes are of cast iron with trussed type brake beam; journal boxes of malleable iron with drop forged wedges, lead lined bearings and special oil lubricator. The wheels are of solid forged steel, interchangeable with the French wheels of spoked type, and are on French type axle with journals 140 by 250 m.m. Following are the chief dimensions:—

Length over buffers.....27 ft. 8 $\frac{5}{8}$ ins.
Wheel base.....11 ft. 9 $\frac{1}{2}$ ins.
Width over side steps.....10 ft. 9 $\frac{1}{2}$ ins.

Canadian Built Freight Car for French State Railways.

International Ry.	112
Dartmouth to Deans Branch.....	67
Quebec & St. John Valley Ry.	124

Total 4,057

"The operation of these lines is under the direction of one General Manager, with two general superintendents, one for the Intercolonial and its branches, and the other in charge of the National Transcontinental and the G.T.P.R. Lake Superior Branch. During the present year the Intercolonial has received its share of the increased business enjoyed by railways generally, so much so that the result has been that the current year will be the best in the history of the road. The Minister of Railways has always been of the impression, and I concur with him, that, with the staff at present operating the road, and its good roadbed, increased

1916.	3,800,000.00
Total	\$14,413,264.99
Actual expenses to Dec. 31, 1915.....	\$ 8,896,754.84
Estimated expenses for Jan., Feb. and Mar., 1916	3,360,000.00
Transferred during year to renewal of equipment account.....	600,000.00
Rail renewal account.....	400,000.00
Fire renewal account.....	100,000.00
Total	\$13,356,754.84

Showing a surplus of.....\$ 1,056,510.15

Following are the traffic statistics:—

	Tons (revenue) and passengers moved.	
	Passengers Number.	Freight Tons.
1913-14	3,983,511	5,287,740
1914-15	3,613,371	4,539,002
Decrease	370,140	758,738

Tons (revenue) and passengers moved one ton mile:

	Passengers Number.	Freight Tons.
1914-15	176,189,749	1,189,017,914
1913-14	159,843,276	970,395,253
Increase	16,346,473	218,622,661

	Passengers Number.	Freight Tons.
1914-15	3,234,202	5,893,003
1913-14	2,355,268	4,869,879
Increase	878,934	1,023,124

In regard to the Prince Edward Island Ry., the acting Minister said: "Up to Nov. 30, 1915, we have succeeded in reducing the operating expenses nearly \$34,200. The earnings, however, were \$8,700 less than for the same period last year. The deficit on this road this year as compared with the same period last year, has been reduced \$25,500, and unless winter conditions are severe the same relation should continue until the end of the year. Last year the deficit in the operation of this road was \$182,731.53."

Referring to the operation of the National Transcontinental Ry., the acting Minister stated that a service was placed in operation on the line from Superior Jct. to Quebec, June 1, the G.T.P.R. Lake Superior branch having been leased from that company May 15. The G.T.P.R. operated the line from Winnipeg to Superior Jct., and the Lake Superior branch as agents of the Government until July 1, when the Department took over the entire operation of the lines, the G.T.P.R. employees being retained. The terminals at Transcona were made joint terminals between the National Transcontinental and the G.T.P.R. and the latter company's locomotives are repaired in the Transcona shops at cost, plus 10%. A daily through westbound freight service between Cochrane and Winnipeg was started in August, which gives an average of 15 paying loads a day. A daily passenger service is given between Quebec and La Tuque and between Levis and Monk. Bi-weekly mixed trains are run between La Tuque and Cochrane, and tri-weekly mixed trains between Moncton and Chaudiere, and as many freight trains are run as the traffic requires. From early in September to the end of the season of navigation, 26,173 cars of grain were delivered at Fort William, which is about two and one-half times that handled last year under G.T.P.R. operation. To relieve the grain blockade at Fort William and take advantage of elevator space at Quebec and Montreal, an emergency freight rate which would compare favorably with lake and rail rate was put into effect, under which the National Transcontinental undertakes to handle grain from Armstrong (the geographical position of which corresponds with Fort William) to Quebec and Montreal at 6c a bushel. A considerable amount of traffic is being arranged for in this way. To relieve the Fort William situation further, grain is now being hauled from Fort William to Atlantic ports, which requires a back haul to Superior Jct., and in this way 50 cars of grain a day are being moved."

The N.T.R. gross earnings to Dec. 1, were \$2,962,113.40, and the operating expenses \$1,975,994.36 to which must be added the rental of the Lake Superior branch for seven months, \$350,000, showing a deficit of \$30,000 to that date. The reports received since indicate that the traffic handled during December gave a small surplus. For the remaining three months of the fiscal year to Mar. 31, deficits are to be expected.

James A. Allan, formerly a director of the Allan Line Steamship Co., at Glasgow, Scotland, died there Apr. 17.

Railway Land Grants Extended by Quebec Legislature.

The Quebec Legislature has extended for four years the time for earning lands granted in aid of railway construction as follows:

Argenteuil Ry.—2,000 acres a mile for line from the Grenville Canal in Grenville Tsp., in the direction of Arundle, 15 miles. (June, 1912, pg. 299.)

Canada & Gulf Terminal Ry.—3,000 acres a mile for line from Matane to Gaspé Basin, 190 miles. (Dec., 1914, pg. 545.)

Canadian Pacific Ry.—2,000 acres a mile for line from Waltham station to Creuse River or Ferguson Point, 20 miles.

Caughnawaga to Dundee, Que.—2,000 acres a mile for line from Caughnawaga, Que., near Adirondack Jct., on the New York Central Rd. to St. Jean, and on to Dundee, Huntingdon County, 60 miles.

Chaudiere Jct. to Sherbrooke, etc.—2,000 acres a mile for line from Chaudiere Jct. to Sherbrooke, 120 miles, with a branch from St. Agathe to Lyster, 10 miles, and another branch from St. Agathe to Black Lake, 30 miles. (May, 1912, pg. 238.)

Grand Lake & Bell River Ry.—2,000 acres a mile for line from National Transcontinental Ry. at Bell River to Twenty-one Mile Bay on Grand Lake, Pontiac County. (Nov., 1912, pg. 557.)

Great Northern Ry.—2,000 acres a mile for line from St. Sauveur to St. Jerome, 15 miles; and to the C.N.Q.Ry. 3,000 acres a mile for 16 miles of line in Montcalm County; 2,000 acres a mile for 65 miles from near Montreal to a junction with the C.N.Q.Ry. near Grenville; 2,000 acres a mile for 82 miles from Quebec to Garneau Jct., with a five mile branch to the Quebec bridge, and a 7½ mile line from Limoilou to the Montmorency River.

Ha Ha Bay Ry.—2,000 acres a mile for line north of Chicoutimi, 4 miles, and a 12 mile line through Laterriere towards Lake Kenogami. (See Roberval-Saguenay Ry., April, pg. 139.)

Indian River Ry.—3,000 acres a mile for line from north end of Lake Megantic to the International Boundary, 19 miles. (May, 1912, pg. 238.)

Interprovincial & James Bay Ry.—4,000 acres a mile for line from the present C.P.R. terminus at Gordon Creek to Ville Marie, 50 miles.

James Bay & Eastern Ry.—4,000 acres a mile for line from Roberval westerly towards James Bay, 30 miles.

Joliette & Lake Manuan Ry.—4,000 acres a mile for a line from Joliette in the direction of Lake Manuan, 60 miles. (Feb., pg. 49.)

Kamouraska & L'Islet Ry.—2,000 acres a mile for line from River Ouelle wharf on the St. Lawrence River to the National Transcontinental Ry. at St. Perpetue, 25 miles.

Little Nation Ry.—3,000 acres a mile for line from Cheneville to Lake Nominig near the C.P.R., 30 miles. (July, 1913, pg. 331.)

Metabetchouan Ry.—1,000 acres a mile for line from Lake Audette to St. Andre, on the Metabetchouan River, 13 miles.

Napierville Jct. Ry.—2,000 acres a mile for line from St. Constant to the International Boundary, 27.25 miles. (See Delaware & Hudson Co., Jan., pg. 11.)

North Ry.—2,000 acres a mile for line

from Montreal to the National Transcontinental Ry., 837 miles west of Moncton, N.B., 200 miles; and 5,000 acres a mile for line in extension of the above to the mouth of the Nottaway River, on James Bay, 300 miles. (May, 1915, pg. 171.)

North Shore Power, Ry. & Navigation Co.—3,000 acres a mile for line from Seven Islands Bay to Clarke City on St. Marys River, 15 miles.

Northern Colonization Ry.—3,000 acres a mile for line from Mount Laurier, 100 miles, in the direction of Lac des Turges.

Orford Mountain Ry.—2,000 acres a mile for line from Bolton via Mansonville to the International Boundary, 10.66 miles; from Windsor Mills to Brampton Falls, 8 miles; and from the Melbourne railway crossing into the Village of Melbourne, 3.50 miles.

Quebec & Lake St. John Ry.—3,000 acres a mile for line from Valcartier to St. Catharines; from Valcartier towards Gosford, 4.50 miles; and a 12 mile extension of a branch line to Valcartier.

Quebec & Saguenay Ry.—3,000 acres a mile for a line from St. Joachim to Nairn Falls, 63 miles, and thence to Ha Ha Bay, 72 miles. (Nov., pg. 422.)

Quebec Central Ry.—3,000 acres a mile for a line from mileage 30 beyond St. George to mileage 31.34, and 2,000 acres a mile for a further distance of 25 miles easterly. (April, pg. 139.)

Quebec Eastern Ry.—2,000 acres a mile for a line from Chaudiere Jct. to Levis, 120 miles; from Ste. Agathe to Lyster, 10 miles, and from Ste. Agathe to Black Lake, 30 miles. (May, 1913, pg. 220.)

Quebec, Montreal & Southern Ry.—2,000 acres a mile for a line from Ste. Philomene towards Levis, 52.66 miles, and from Becancourt to the St. Lawrence River, 3.37 miles. (See Delaware & Hudson Co., Jan., pg. 11.)

Roberval-Saguenay Ry.—3,000 acres a mile for a line from the junction at Jonquieres Jct., of the Ha Ha Bay Ry. and the Quebec & Lake St. John Ry., crossing the Saguenay River, and extending to the north of Lake Mistassini, 80 miles. (April, pg. 129.)

Richmond, Magog & Stanstead Ry.—2,000 acres a mile for line from Richmond, passing through Magog, to Stanstead, 55 miles, with a branch from Cherry River to Waterloo, 20 miles.

Richmond to Drummondville.—2,000 acres a mile for line from Richmond or Melbourne to Drummondville, 27 miles.

St. Charles & Huron River Ry.—2,000 acres a mile for line from Lorette on the Quebec & Lake St. John Ry. to Stoneham, 7.5 miles.

St. Leonard to Duddeswell.—2,000 acres a mile for line from St. Leonard, on the Intercolonial Ry., to a junction with the Quebec Central Ry. and the Maine Central Rd. in Duddeswell Tsp.

Accidents to G.T.R. Employees.—H. G. Kelley, Vice President, G.T.R., has issued a message to employees as follows: "There has been a gratifying reduction in the number of employees injured. This improvement, it is believed, is due largely to the exercise of care and diligence, which is expected as a matter of course from railway men. The management, however, takes this opportunity to express grateful appreciation to officers and employees whose fidelity to duty has made this announcement possible."

Railway Development, Projected Lines, Surveys, Construction Betterments, Etc.

Atlin Ry.—The Dominion Parliament has extended for two years the time within which the company may start the construction of its projected railway from Atlin, or the southern end of Atlin Lake, southerly to where the Falcon River intersects the International Boundary, B.C. (Mar., pg. 106.)

Burrard Inlet Tunnel & Bridge Co.—The Dominion Parliament has extended for two years the time within which the company may build its proposed bridge and tunnel at Burrard Inlet, Vancouver, B.C., and the connecting railways. (Feb., pg. 49.)

Canadian Pacific Ry.—It is said that the construction of stock yards at Saskatoon, Sask., will be started at an early date.

A press report states that a six stall addition to the locomotive house at Weyburn, Sask., is to be erected at an early date. The new ice house at Weyburn is reported to be partially completed.

Grant Hall, Vice President and General Manager, Western Lines, is reported to have informed a deputation from the district to be served by the proposed Retlaw-Suffield line, that it is expected to have an appropriation for its construction in the estimates for 1917. (April, pg. 138.)

Canton & Grand Lake Ry.—The New Brunswick Legislature is being asked to give authority to build a railway from Canton, on the National Transcontinental Ry., to Flower Cove on the St. John River, to open up a new coal mining area. (April, pg. 139.)

Edmonton, Dunvegan & British Columbia Ry.—Tracklaying on the Grand Prairie Branch, extending from Spirit River to Grand Prairie, 60 miles, was completed Mar. 29, when there was a popular celebration at the track end. W. R. Smith, General Manager and Chief Engineer, is reported to have stated that ballasting would be rushed to completion, and that two trains a week in each direction, would be operated between McLennan and Grand Prairie City, at as early a date as possible. (Mar., pg. 106.)

Edmonton & South Western Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Edmonton, southwesterly to the Blue Rapids on the Saskatchewan River, 70 miles. This railway is projected in connection with a power development company, which secured an understanding with the Edmonton City Council respecting a contract. The bylaw authorizing the council to enter into a contract with the company was approved by the rate-payers in 1915, and was after considerable discussion finally passed by the council, and steps were taken to have it ratified by the Legislature. Subsequently the council rescinded the bylaw, and notified the Alberta Legislature that it was no longer a party to the bill for the ratification of the bylaw. The resulting tangle has not been straightened out. (See Hydro Electric Power Projects at Edmonton, April, pg. 155.)

Farnham & Granby Ry.—The Dominion Parliament has extended for two years the time within which the company may build its projected railway from Farnham, on the C.P.R., to Granby, and thence to Windsor Mills or Montreal, Que. C. L. Hervey, M.Can.Soc.C.E., Montreal, is one of the provisional directors. (Nov., 1915, pg. 437.)

Grand Trunk Ry.—Preparatory work is

being done at Bathurst St., Toronto, for the erection of a new bridge across the railway tracks.

The company proposes to build a new station at Ferguson Ave., Hamilton, Ont., at an estimated cost of \$8,000. (April, pg. 138.)

Grand Trunk Pacific Ry.—The Board of Railway Commissioners has ordered the company to build an interchange track between its spur to the Government elevator, and the G.T.R. Outlook Branch at Moose Jaw, Sask., by June 1. The cost of building and maintaining the track is to be apportioned by the commissioners at the next sitting in Moose Jaw. (Mar., pg. 106.)

Great Northern Ry.—A press report states that it is proposed to start construction at an early date on a line 14 miles long to connect the present Cloverdale-Abbotsford line with the Canadian Northern Pacific Ry. at Sam's Landing, B.C.

The building line for the station building on the False Creek site, 375 ft. east of Main St., has been finally approved by the Vancouver City Council. The question of the cost of the station building, which has been raised by the B.C. Government, the Council decided, was not one with which it had to do. A contract for the erection of the station is reported to have been let to Grant, Smith & McDonnell, who will start work at once. F. L. Townley, Vancouver, is the architect in charge. The plans provide for a structure of two units, a main building with terminal facilities on the main floor, and office accommodation above, and an L wing containing the baggage, mail and express offices and rooms. The building will be of brick with terra cotta trimmings. The main structure will be 235 x 60 ft., and the L will be 130 x 42½ ft. There will be a glass covered concourse leading to 11 sets of tracks, and in the centre of the main building will be a domed waiting room which will reach up above the roof of the two storied wings. The open space to Main St., 375 ft., will be laid out in grass and shrubberies.

Application is being made to the Board of Railway Commissioners for approval of an agreement dated Nov. 6, 1915, whereby the Victoria, Vancouver & Eastern Ry. & Navigation Co. grants the Canadian Northern Pacific Ry. joint and equal use in common, of the main and passenger tracks (subject to certain reservations), and the train, standing and industrial spurs, from the north approach of the Fraser River bridge at New Westminster, to the junction of the two companies' tracks at the east boundary of the C.N.P.R. property at False Creek, Vancouver, subject to all exceptions and upon terms set out in the agreement. (Mar., pg. 107.)

Hudson Bay, Peace River & Pacific Ry.—A press report states that it is proposed to start some construction on this projected railway from Winnipeg along the east shore of Lake Winnipeg, at an early date, but it is not stated where work will be started. Some time ago the company asked the Transcona City Council for concessions in that city for terminal purposes, but the project was not favorably entertained, and nothing has transpired since as to the company's proposal for terminals. Although it is reported that the New York syndicate interested "has a backing of \$200,000,000," it is not thought likely that anything will

be done in the way of construction at present at least. The route and other plans have not yet been approved by the Minister of Railways and the Board of Railway Commissioners. (May, 1915, pg. 171.)

Intercolonial Ry.—We are officially advised that the plans for the new station at Levis, Que., are being revised, and that no work will be undertaken in connection with the project until the revision is approved.

Joliette & Lake Manuan Colonization Ry.—The Dominion Parliament has extended for two years the time for the construction of this projected railway from Joliette northerly to Lake Manuan and the National Transcontinental Ry., and from Joliette southerly to Montreal. (Feb., pg. 49.)

Kettle Valley Lines.—The Dominion Parliament has extended for two years the time for the construction of a number of branch lines, and has confirmed an agreement made with the Vancouver, Victoria & Eastern Ry. and Navigation Co., respecting joint sections of railway. Under the terms of the agreement dated July 19, 1914, the latter company has constructed a railway from the headblock of the east switch of the K.V. lines at Princeton to the headblock of the west switch of the K.V. lines at Otter Summit, and the agreement provides for the use of the same by the K.V. Lines, on payment of 5% on the ascertained cost of construction. The agreement provides what each company may do on the joint section, and is to run for 999 years. It is endorsed for the K.V. Lines by the C.P.R., and for the V.V. & E. Ry. and N. Co., by the Great Northern Ry., U. S. (Feb., pg. 49.)

Lake Huron & Northern Ontario Ry.—There was a discussion in the Ontario Legislature April 7, on a motion not to renew or extend the time within which the company might earn the right to purchase land estimated at 1,230,000 acres, as provided in the statutes of 1913, chap. 134. It was explained that under the provisions of the act the company had a certain time within which to extend its railway from the present terminus at Rock Lake, to the National Transcontinental Ry., and that in order to earn the right to take up the land, a certain number of settlers had to be brought into the area, a certain sum expended upon development and other conditions fulfilled before any areas of land were sold, and before a price was fixed. The government was not, it was stated, taking any risk in the matter. The time limit fixed would expire within a few months, and there need be no worry about extensions of it. The motion was thereupon withdrawn. (April, pg. 138.)

Michigan Central Rd.—A press report states that the company proposes to expend about \$250,000 upon a new locomotive house, etc., at Montrose, Ont., during this current year. (Sept., 1915, pg. 310.)

National Transcontinental Ry.—The car shops at Quebec have been completed, and are reported to be ready for the installation of the machinery. The electric power plant is to be operated by steam, and the plant for this purpose is being installed. It is expected that the shops will be used at first for repair work only. (April, pg. 138.)

Ontario Niagara Connecting Bridge Co.—The Dominion Parliament has incorporated a company with this title to build

a bridge across the Niagara River, with connecting railways, in connection with a company incorporated for a similar purpose in New York State. It is said that this company is being promoted by Canadian Northern Ry. interests to connect up the Toronto, Niagara & Western Ry. or the Niagara, St. Catharines & Toronto Ry., or both of them, with the railways in the U. S. (April, pg. 139.)

Pacific Great Eastern Ry.—The Minister of Railways for British Columbia answered a large number of questions relating to the cost of building this railway, in the Legislature April 4. The really important fact stated was that it was estimated that the total cost of completing the line from the Second Narrows of Burrard Inlet to Prince George, 479.6 miles, would be \$11,463,730.11. (April, pg. 138.)

Pacific, Peace River & Athabaska Ry.—Negotiations are reported to have been carried on since early in March between C. A. Law, Vancouver, representing the promoters of the P., P. R. & A. Ry. to obtain a government guarantee of bonds for \$35,000 a mile from the British Columbia Government for building a railway from Prince George into the Peace River country, as a part of its railway. The projected line from Prince George would connect with the projected main line at Kitimat Arm on the Pacific Ocean, at Hudsons Hope on the Peace River, and would be 150 miles long. (May, 1915, pg. 171.)

Peace River Tramway & Navigation Co.—The Dominion Parliament has extended for two years the time within which the company may build its projected railways to connect up certain stretches of navigation on the Peace River, Alta. This is one of the projects which are being worked out in Alberta and Northern British Columbia, in which Baron Rhondda (D. A. Thomas), of Cardiff, Wales, is interested. (April, pg. 138.)

Prince Edward Island Car Ferries.—Work in connection with the car ferry terminals at Carleton Point, P.E.I., has been opened up for the season. There are reported to be seven concrete cribs yet to be placed on the pier to form the berth for the vessel, together with considerable other work. The work is expected to be completed by Dec. 1. There is about half a mile of the branch railway yet to be built to connect the terminals with the island railway system. The main part of the branch line was graded and two miles of track laid to Carleton Point in 1914. (April, pg. 139.)

Quebec & Saguenay Ry.—The Premier stated in the House of Commons, April 4, that representations had been made to the Government from time to time with regard to the desirability of completing this railway, because a very large part of the expenditure which would make it serviceable had already been made. There was no announcement, however, to be made at present, and no decision had been reached by the Government with regard to it. (Nov. 1915, pg. 422.)

St. John & Quebec Ry.—A delegation representing the New Brunswick Government waited on the acting Minister of Railways at Ottawa, April 5 in connection with the construction of this railway. The point at issue is the route to be followed from St. John to Gagetown. As originally planned, the route would carry the line across the St. John and Kennebecasis Rivers, by two bridges which it is estimated would cost about \$3,000,000. These bridges were to have been built by the Dominion, and leased to the railway company. Recent surveys show that,

owing to the nature of the river bottom, it would be a difficult matter to erect the bridges, and it is recommended that their construction be abandoned, and a new route laid out along the west bank of the St. John River, via Westfield, thus giving the line temporary entry into St. John over the C.P.R. The negotiations between the two governments are progressing. (April, pg. 139.)

Canadian Government Railways Officials, Salaries, Etc.

In reply to questions in the Senate recently, respecting the position and salaries of certain Canadian Government Railways officials, Senator Loughheed said: "F. P. Gutelius is Manager of the Canadian Government Railways, in which the Eastern Division of the National Transcontinental Ry. is included. His salary is \$20,000 a year.

"W. H. Ferguson, M.D., is Chief Medical Officer. The position is a new one, rendered necessary by the enlargement of the Government Railways system, by the taking over for operation of the National Transcontinental Ry., the Grand Trunk Pacific Ry.'s Lake Superior Branch, the International Ry. of New Brunswick, the New Brunswick & Prince Edward Island Ry., the St. John & Quebec Ry., the Dartmouth to Deans branch, in addition to the Intercolonial Ry. and the Prince Edward Island Ry. His salary as Chief Medical Officer of the Employees' Relief and Insurance Association is \$500; as Chief Medical Officer of the Provident Fund, \$1,000; as Chief Medical Officer of the C.G.R., \$1,000, total \$2,500. Dr. Ferguson has supervision of all medical work on the Ry.'s, personally looks after work on the railways, personally looks after all serious damage claims for alleged injuries and passes on all claims on the Insurance Association or Provident Fund."

Demurrage Charges on Privately Owned Cars on Private Sidings.

The Assistant Chief Railway Commissioner, D'Arcy Scott, has given the following judgment:—The Board have been asked to give a ruling on the application of Car Service Rule 12 to the following facts: The Nichols Chemical Co., Ltd., of Toronto, owns a number of private cars specially constructed for the transportation of acids. The railway companies pay $\frac{3}{4}$ c a mile hauled to the owners of such private cars for the use of the cars. It was contended by the company that the tank cars used for the transportation of acids are different from any other class of cars in that the unloading connections often become corroded and buyers are unable to unload without the assistance of the shippers. The consignees have sometimes to send to the Chemical Co. for men to repair the outlet pipes, they being afraid to allow their own men to make the necessary repairs on account of the nature of the material. The Chemical Co. is, therefore, agreeable to leave its cars with consignees till they can be conveniently unloaded. The cars are unloaded on the private sidings of the consignees. It was contended by the Chemical Co. that its cars were leased to its consignees till released by the consignee after being unloaded, but I have been unable to get evidence in substantiation of that statement. Where delays over the free time have occurred in unloading, the railway companies have charged the consignee demurrage.

Canadian Car Service Rule 12 is as follows:—"When both cars and tracks are owned by the same private party, no car service tolls shall be charged." These cars are not owned by the consignee and therefore are not exempt under this rule from the usual demurrage charges. The object of the car service rules is not to secure additional revenue for the railways so much as to bring about the prompt release of cars so that they may be available for other shipments. This applies to privately owned cars as well as cars owned by railway companies.

If the contention of the Chemical Co. that more free time is required for the unloading of these cars because of the liability of the outlet pipe to corrode is to be pressed, then its application should be to amend the Car Service Rule accordingly. I think on the present application the parties might be informed that Rule 12 does not exempt the consignees of the Chemical Co. from the payment of demurrage.

Cost and Speed of Constructing Rogers Pass Tunnel.

By J. G. Sullivan, Chief Engineer, Western Lines,
Canadian Pacific Ry.

Since writing the paper (printed on pgs. 169 to 171 of this issue), I have been asked by several persons to give the figures showing the cost of driving this tunnel on the method adopted. The work has proceeded far enough now that we can state with safety that the cost of driving this tunnel through rock, including in this price the cost of driving 19,610 lin. ft. of pioneer tunnel, 12 cross cuts, each 40 ft. long, installation of plant, including freight on it, the proportionate cost of building 5 miles of railway tracks, and other overhead charges, plus 10% on all expenditures, will amount to a little less than \$5 a cubic yard for tunnel excavation in the tunnel proper. This is just about half the amount bid by contractors who proposed to use the European method, and who required a time limit of from 42 to 48 months.

The progress of the work up till Apr. 15 is as follows: The drilling for the enlargement has all been completed during the past week. The plan was to continue the pioneer tunnels until such time that the work required to remove the centre heading between the last two cross cuts, and to drill for the enlargement between these cross cuts, would be completed before the steam shovels had the enlargement completed up to the last cross cut, for the reason that after the steam shovel passed the last cross cut, drilling could not be done for the enlargement without carrying air pipes over the muck pile in front of the shovels. This work was carried out on schedule time, with only 10 or 15 days to spare.

On April 15 the enlargement from the west end had reached a point 150 ft. east of cross cut no. 6. The shovel doing the enlargement from the east end had reached a point 130 ft. east of cross cut no. 6 from the east pioneer, leaving 4,604 ft. to be completed between shovels at this date. During March, 1916, the steam shovels on the west end advanced 1,050 ft., or at the rate of over 2.3 miles a year, in a single heading.

The Eastern Canadian Passenger Association's territory has been changed to embrace territory in Canada east of and including Armstrong, Port Arthur and Sault Ste. Marie, Ont., and the St. Clair and Detroit Rivers.

Freight and Passenger Traffic Notes.

The C.P.R. put into effect April 4, reduced fares for farm laborers from Pacific Coast points to the prairie provinces.

The Grand Trunk Pacific Ry. has arranged with the Saskatoon Taxicab Co., Ltd., to operate a passenger transfer between South Saskatoon station and the hotels in Saskatoon.

It is reported that a daily train service will be put on the Canadian Northern Ry., between Vancouver and Edmonton, June 1, replacing the present tri-weekly service; and that an extra train to take care of the increasing local traffic will be put on between Vancouver and Hope, B.C.

The Kent Northern Ry., which has hitherto operated its trains daily, Sundays excepted, between Kent Jct. on the Intercolonial Ry. and Richibucto, N.B., has put in force a new schedule, giving a service on Mondays, Wednesdays, Fridays and Saturdays only.

The Canadian Northern Ry. has been ordered by the Board of Railway Commissioners, to furnish a tri-weekly train and mail service on its Winnipegosis Branch from June 1 to Sept. 15, when the company may, if it so desires, reduce the service to a semi weekly one.

The Quebec Central Ry. has extended its Chaudiere subdivision from St. Camille, the former terminus, to Daaquam, 10 miles, and to English Lake, 19 miles. There are three trains a day from Valley Jct., the connection with the main line, to St. Camille, and an accommodation train from St. Camille to English Lake, on Tuesdays, Thursdays and Saturdays.

The C.P.R. has issued new rate cards showing increases made in fares to single trip rates on its steamship from Seattle, Wash., Victoria and Vancouver, B.C., to Alaskan points. The rates are increased \$2 on the first class rates to Ketchikan and \$3 to Juneau, Wrangel and Skagway, and \$2 on second class fares to Skagway and Juneau, and \$1 to Wrangel and Ketchikan.

C. H. Nicholson, Manager Grand Trunk Pacific Steamships, is reported to have said that an official courier will be attached to each of the company's steamships running to Alaska, after June 1. The couriers will be thoroughly acquainted with Alaska and the Yukon, and their special duty will be to entertain, and give information to travellers going into the country.

The Chicago, Milwaukee & Pacific Ry., through its connection with the Bellingham Bay & Northern Ry., reaches the International Boundary at Sumas, Wash., where a connection has been made with the British Columbia Electric Ry. An arrangement has been made with the B.C. Government by which the C.M. & St.P.R. cars run over the Fraser River bridge at New Westminster. The B.C.E.R. is handling the traffic for the C.M. & St.P.R. into New Westminster and Vancouver.

The C.P.R. announces that a daily train service will be inaugurated, via the Kettle Valley Lines, between Vancouver and Nelson, June 3. This is possible owing to the completion of the K.V.R. Coquihalla Valley section, extending from Hope to Otter Summit. A train will leave Vancouver every evening, reaching Nelson on the following evening, and a train will leave Nelson every morning, reaching Vancouver on the following morning. It takes practically two days to make this trip at present via the Arrowhead and Slocan Lakes.

Canadian Government Railways Construction and Betterments.

Speaking of capital expenditure on permanent betterments and on new works for the development of service on the Intercolonial and Prince Edward Island Railways, the acting Minister of Railways said in the House of Commons recently: "There was in last year's estimates a vote of \$9,290,650 for capital expenditure. The estimated expenditure under this head is expected to be about \$7,100,000. One of the most important and necessary works undertaken has been the strengthening of bridges to allow the use of the heavier power rendered necessary by modern railway practice. This work will, it is expected, be completed during the fiscal year ending Mar. 31, 1917. Additional facilities for the economical handling of business have been provided at 27 points. About 5 miles of double tracking between Chaudiere Jct. and St. Romuald have been completed. Diversions of the line between Nelson and Derby Jct., as well as a diversion between North Sydney and Leitches Creek (4.3 miles), have been completed. Pier 2 at Halifax is completed and in use. The subway at Moncton is practically completed. The car ferry Scotia, 2 has been delivered and is in use, and the Bathurst spur line has been completed. The Levis coaling plant has been completed, and is in operation.

"When improvement of the terminals at Halifax and St. John was first considered by the Minister with a view to the necessity of providing for the future increase in the business of the Government Railways, we all agreed that it was necessary that some provision should be made to properly take care of the increasing development of the Dominion, and this is more than ever true now that we have the National Transcontinental under Government control, and my own opinion is that the necessity for this terminal work is much greater than ever before, and the work of providing the required accommodation is being pressed as fast as possible. The situation so far as Halifax is concerned is as follows: Sections 1 and 2 of the railway from Rockingham to Jubilee House, His Majesty's lumber yard and Reid Rock in Halifax Harbor, are under construction for a total distance of 7½ miles. Work to the value of \$1,574,834.71 has been done. Good progress is being made on the first unit of docks, and 6,500 ft. of quay walls have been dredged and filled. Also substructures for buildings, sewers, etc., have been completed. Work to the value of \$1,349,119.64 has been done, and the work is about 30% completed. The unit should be finished by Nov. 1, 1917. The expenditure in connection with the Cook Construction Co. and Wheaton Bros. contracts has been \$1,574,834.71, and in connection with Foley Bros., Welch, Stewart and Fauquier's contract, \$1,349,119.64. On the opposite side of the harbor at Halifax, from the town of Dartmouth, we have completed the construction of a railway locally known as the Dartmouth to Deans branch and which at present extends to Upper Musquodoboit, 67 miles. The contract for this work was let to M. P. & J. T. Davis in Feb. of 1912, and was completed in January last. There still remains a number of station buildings to be erected, tenders for which are being called for by the department. A triweekly service has been installed by the Intercolonial Ry. since Jan. 1, 1916.

The total expenditure to Jan. 3, 1916, was \$2,189,485.81. This has been on construction and chargeable to capital account. The work being done at St. John is being carried on by the Public Works Department.

"The work connected with the provision of a car ferry service to Prince Edward Island has not made such progress as was desired and expected. The New Brunswick & Prince Edward Island Ry. has been acquired and is being put into shape to form an adequate link between the main line of the Intercolonial and the ferry landing, at the P.E.I. Ry. The contract with Armstrong, Whitworth Co. was satisfactorily completed, and the car ferry Prince Edward Island was delivered during the summer notwithstanding war conditions. The situation has not been as satisfactory with respect to the terminal works. At the outset a season was lost at Carleton Point through the default of those to whom the contract for this terminal was at first awarded. Further serious delays have resulted from the stormy weather and exposed conditions under which the work has necessarily had to be carried on. With the advance of the breakwater these conditions improve. At Cape Tormentine the principal work remaining to be done is the completion of the breakwater, the dredging, and the placing of riprap on exposed faces of the pier head. At Carleton Point several more cribs are necessary to complete the car ferry landing, some dredging has to be done, and further work done on the breakwater and rock approach pier. The contract for the steel transfer bridges, to connect the car ferry's deck with the pier, has been let, and works are ready for their reception. The total estimated cost of the car ferry and terminals is \$2,850,000, of which \$1,975,000 has been expended."

National Transcontinental Ry. Operation.—The Premier stated in the House of Commons, Mar. 31, that the operation of the National Transcontinental Ry., from Moncton to Winnipeg, by the government could not be a permanent arrangement until the government had entered into an agreement to take over the road and to relieve the Grand Trunk Pacific Ry. from its operation. No such agreement had been made, and the government had no power to make one without the authority of Parliament.

Canadian Society of Civil Engineers.—At the regular monthly meeting in Montreal, April 13, John Murphy, chairman of the Ottawa Branch, gave an informal talk, illustrated by views, describing his trip over the Panama Canal, and referring particularly to the difficulties of earth slides in the Culebra Cut. Lt.-Col. F. A. Snyder described an original diagram for making military scales for interpolation of contours and reduction and enlargement of maps.

Canadian Railway Club.—At the monthly meeting in Montreal April 11, S. J. Sarjant, M.I.C.E., ex-Locomotive Superintendent, Great Indian Peninsula Ry., read a paper on the railways of India, which was illustrated by stereopticon views.

The C.P.R. has put in operation a rule to compel passengers to show their tickets on boarding trains at all terminal points on its western lines.

Railway Rolling Stock Notes.

The Canadian Pacific is going to purchase 26 steel ore cars, 2 scale test cars and 2 ditchers.

The Canadian Northern has received 5 mail cars, nos. 4000 to 4004, from Preston Car & Coach Co.

The Canadian Government Railways has been voted \$1,100,000 to expend on rolling stock during this fiscal year.

The Canadian Cement Co. has received 12 narrow gauge charging cars and 30 narrow gauge ingot cars from Canadian Car & Foundry Co.

Canadian Government Railways have received one consolidation freight locomotive for the Intercolonial Division, from Canadian Allis-Chalmers, Ltd.

The Canadian Pacific is building the following rolling stock at its Angus shops, Montreal: 12 steel mail cars, 4 steel baggage cars, 1 steel dining car, 1 steel mail and express car, 100 passenger refrigerator cars, 302 freight refrigerator cars, 1,399 box cars, 28 stock cars, 180 automobile cars, 1 auto furniture car, 3 furniture cars, 20 steel coal cars.

The Canadian Pacific has given orders for the conversion of cars at its Angus shops, Montreal, as follows: 4 sleeping cars to cafe parlor cars, 8 sleeping cars to parlor cars, 4 parlor cars to smoking cars, 6 first or second class cars to baggage and smoking cars. Four cafe parlor cars, 8 parlor cars and 48 sleeping cars, heretofore gas lighted, are to be electric lighted. Twelve combination cars are to be electric lighted.

The acting Minister of Railways stated in the House of Commons, April 5, that the Canadian Government Railways leased locomotives recently as follows:—From the C.P.R., at \$13.50 a day; from

Canada Iron Foundries, Ltd., and the Bangor & Aroostook Rd., at \$15 a day. These locomotives have an effective tractive capacity of 27,000 lbs. for C.P.R. locomotives, 37,000 for Canada Iron Foundries locomotives, and 23,152 for Bangor & Aroostook Rd. locomotives.

Canadian Car & Foundry Co. has received an order from the French State Railways, for 1,000 high sided gondola cars, type L.F.C., to be fitted with brakeman's cab and hand screw brake gear. Following are the chief details:

Length of underframe.....23 ft. 11½ ins.
Length inside box.....21 ft. 7¾ ins.
Width inside.....8 ft. 2¾ ins.
Depth inside.....4 ft. 9 ins.
Car type.....Steel underframe and wood siding
Wheels, no. and details....4 with cast steel centres and tires, 41½ ins. diam.
Axles.....6½ ins. diam.
Journals.....5½ by 9 13/16 ins.

The Algoma Eastern Ry. has ordered 2 consolidation locomotives from Canadian Locomotive Co. Following are the chief details:—

Weight on drivers.....175,400 lbs.
Weight, total.....200,400 lbs.
Wheel base, rigid.....15 ft. 10 ins.
Wheel base, engine, total.....24 ft. 4½ ins.
Wheel base engine and tender.....53 ft. 6¼ ins.
Heating surface, firebox.....161 sq. ft.
Heating surface, tubes.....2,078 sq. ft.
Heating surface, total.....2,239 sq. ft.
Driving wheels, diam.....56 ins.
Driving wheels, centres.....Cast steel
Driving journals, diam. and length.....9 and 9½ by 12 ins.

Cylinders, diam. and stroke.....22 by 28 ins.
Boiler, type.....Radial stayed
Boiler pressure.....200 lbs.
Tubes, no. and diam.....206-2 ins.; 28-5½ ins.
Tubes, length.....14 ft. 2½ ins.
Air brakes.....Westinghouse American E.T.6
Superheater.....Locomotive Superheater Co. Type A
Weight of tender loaded.....126,500 lbs.
Tank type.....Water bottom
Tank capacity.....5,000 imp. gals.
Coal capacity.....10 tons
Truck type.....Equalizer
Truck wheels, diam.....34 ins.
Truck wheels, type.....Steel tired, cast steel centres
Truck journals.....5½ by 10 ins.
Brake beam.....M.C.B. steel

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, for Western Lines, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$1,206,100	\$921,000	\$285,100	x\$145,400
Aug.	1,192,800	954,000	238,800	x5,900
Sept.	2,014,500	1,358,000	661,600	1,900
	\$4,413,600	\$3,227,000	\$1,186,600	x\$79,300
Decr.	\$658,300	\$579,000	\$79,300	

x Decrease.
Mileage in operation at Sept. 30, 1915, 4,965, against 4,670 at Sept. 30, 1914.

Commencing with October, the figures show the earnings of the entire system, both eastern and western lines.

	Gross Earnings	Expenses	Net Earnings	Increase
Oct.	\$3,678,500	\$2,421,500	\$1,257,000	\$537,800
Nov.	3,535,200	2,323,800	1,211,400	618,400
Dec.	3,435,600	2,233,500	1,202,100	768,900
Jan.	2,086,800	1,831,400	255,400	88,100
Feb.	2,089,200	1,959,800	129,400	x193,500
	\$14,825,300	\$10,770,000	\$4,055,300	\$1,841,200
Inc.	\$5,189,300	\$3,348,100	\$1,841,200	

x Decrease.
February was the worst month in the company's history for operating its business, continuous snow storms and low temperature extending over the entire system caused inconceivable difficulties in maintaining a partial service at very excessive cost.

Approximate earnings for March, \$2,517,000, against \$1,898,500 for March, 1915, and for two weeks ended Apr. 14, \$1,340,900, against \$910,700 for same period 1915.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$7,895,375.47	\$5,094,972.35	\$2,800,403.12	\$978,042.71
Aug.	8,801,451.52	5,359,136.80	3,442,314.72	79,157.02
Sept.	10,273,165.45	5,527,864.81	4,745,300.64	378,252.25
Oct.	13,453,206.88	6,863,780.29	6,589,426.59	3,258,105.79
Nov.	13,351,283.51	6,996,870.48	6,354,413.03	3,710,340.86
Dec.	12,705,673.45	7,003,351.97	5,702,321.48	3,502,797.67
Jan.	8,588,826.04	6,498,417.81	2,090,408.23	954,174.93
Feb.	9,795,830.30	6,501,487.56	3,294,342.74	315,328.12

\$83,854,820.18 \$49,845,882.07 \$34,008,938.11 \$11,216,113.93
Inc. \$15,071,989.17 \$3,855,875.24 \$11,216,113.93

Approximate earnings for March, \$10,228,000, against \$7,700,000 for March, 1915, and for three weeks ended Apr. 21, \$7,402,000, against \$5,090,000 for same period 1915.

Grand Trunk Railway Earnings.

Following are the earnings and expenses for the G.T.R., including the Canada Atlantic Ry., the G.T.W.R. and the D.G.H. & M.R., for February, compared with those for February, 1915.

	1916.	1915.
Earnings.....	\$3,094,000	\$2,624,400
Expenses.....	2,546,600	2,210,100
Net earnings.....	\$ 547,600	\$ 414,300
Grand Trunk Western Railway.		
Earnings.....	\$ 693,450	\$ 521,900
Expenses.....	594,450	559,400
Net earnings.....	\$ 99,000	\$ 37,500
Detroit, Grand Haven & Milwaukee Ry.		
Earnings.....	\$ 245,300	\$ 178,600
Expenses.....	146,800	212,800
Deficit.....	\$ 1,500	\$ 34,200

TRAFFIC RECEIPTS OF THE SYSTEM.

	1916.	1915.	Increase
Aggregate from Jan. 1 to Feb. 29, —			
G.T.R.	\$9,390,685	\$8,341,996	\$1,048,689
G.T.W.R.	2,094,631	1,665,394	429,237
D.G.H. & M.R.	722,893	560,021	162,872
	\$12,808,209	\$10,567,411	\$2,050,728

Approximate earnings for March, \$4,509,223, against \$1,811,291 for March, 1915, and for two weeks ended Apr. 14, \$2,179,991, against \$1,072,978 for same period 1915.

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section, 916 miles, for March were \$461,107, against \$291,000 for March, 1915. Approximate earnings for two weeks ended Apr. 14, \$1,000,000, against \$511,107 for same period 1915.

Grain in Store at Terminal Elevators, Interior Terminal Elevators and at Public Elevators in the East.

Week ending April 14, 1916.	Wheat. bushels.	Oats. bushels.	Barley. bushels.	Flax bushels.	Totals. bushels.
Fort William—					
C.P.R.	1,301,626	506,983			7,883,738
Consolidated Elevator Co.	1,277,172	310,422	40,607	108,967	1,737,168
Empire Elevator Co.	1,859,885	649,545	148,350	216,537	2,874,317
Ogilvie Flour Mills Co.	1,411,896	151,449	73,030		1,636,375
Western Terminal Elevator Co.	1,553,281	276,251	45,781	140,778	2,016,091
G. T. Pacific	3,718,017	1,803,509	188,168	122,445	5,832,139
Grain Growers' Grain Co.	1,607,483	480,392	184,271		2,272,146
Fort William Elevator Co.	1,061,270	258,904	55,881	26,020	1,402,075
Eastern Terminal Elevator Co.	1,442,588	478,430	59,312		1,980,330
Port Arthur—					
Port Arthur Elevator Co.	5,415,631	2,638,952	489,477	108,762	8,652,822
D. Horn & Co.	227,759	190,129	27,006	185,842	630,736
Dominion Government Elevator	1,916,878	1,009,900	127,372	93,018	3,147,168
Grain afloat.	2,447,386	974,311			3,421,697
Total Terminal Elevators	30,014,375	10,523,820	1,946,238	1,002,369	43,486,802
Calgary Dom. Govt. Elev.	769,085	591,972	14,624	2,509	1,378,190
Saskatoon Dom. Govt. Elev.	1,514,476	848,020	5,235	146,484	2,564,217
Moose Jaw Dom. Govt. Elev.	2,616,037	517,742	22,771	62,829	3,219,429
Total Interior Terminal Elevators	4,899,598	1,957,734	92,632	211,872	7,161,836
Depot Harbor—					
Midland—					
Aberdeen Elevator Co.	5,500	124,250			129,750
Midland Elevator Co.		115,870			115,870
Tiffin, G.T.P.		3,926	189		4,115
Port McNicoll	826,390				826,390
Collingwood		15,910			15,910
Goderich Elevator & Transit Co.	60,208				60,208
Kingston—					
Montreal Transportation Co.					
Commercial Elevator Co.		170,764			170,764
Port Colborne					
Prescott					
Montreal—					
Harbor Commissioners No. 1	632,351	663,831	37,795		1,333,977
Harbor Commissioners No. 2	182,778	540,486	1,101		723,365
Montreal Warehousing Co.	271,482	5,720			277,202
Quebec Harbor Commissioners	697,559	32,211	41,106		770,876
West St. John, N.B.					
Halifax, N.S.					
Total Public Elevators	2,717,316	2,587,961	80,751	8,000	5,394,028
Total Quantity in Store	37,631,289	1,000,000	1,000,000	1,222,211	39,853,500
x Corn					

Mainly About Railway People Throughout Canada.

Francis J. Hunter, Montreal, has been elected a director of the Reid Newfoundland Co.

Dr. C. M. Sanford, for many years local surgeon for the G.T.R., at Brighton, Ont., died there, Apr. 17.

J. J. Hill of the Great Northern Ry., St. Paul, Minn., telegraphed \$5,000 to the Winnipeg Patriotic Fund recently.

F. C. Salter, European Traffic Manager, G.T.R., London, Eng., spent April at Falmouth, Eng., recuperating after two operations.

Mrs. E. Tiffin, wife of the General Western Agent, Canadian Government Railways, Toronto, has left to spend some time at the Pacific coast.

J. W. Leonard, General Manager, Toronto Terminals Ry. Co., has removed from Montreal and taken a house on Roxborough St. East, Toronto.

J. M. Gibbon, General Publicity Agent, C.P.R., Montreal, has been appointed chairman of the Audit Bureau of Circulations' Canadian Advisory Board.

J. G. Sullivan, M.Can.Soc.C.E., Chief Engineer, Western Lines, C.P.R., Winnipeg, has been elected First Vice President of the American Railway Engineering Association for 1916-17.

Lieut. Wm. Blythe Hanna, 92nd Battalion, 48th Highlanders, C.E.F., only son of D. B. Hanna, Third Vice President, Canadian Northern Ry., was married in Toronto, April 21, to Miss M. O. Powis.

F. H. Phippen, K.C., General Counsel, Canadian Northern Ry., returned to Toronto early in April, from Mexico, where he went in connection with some of the enterprises Sir Wm. Mackenzie is interested in.

W. E. Rispin, ticket agent, G.T.R., Chatham, Ont., was advised by cablegram recently that his son-in-law, Major Templeton, of the 48th British Columbia Battalion, had been wounded while on service overseas.

R. J. Mackenzie, of Winnipeg, son of Sir Wm. Mackenzie, President, Canadian Northern Ry., has given the use of Deer Lodge Hotel and grounds, near Winnipeg, for a military convalescent home, rent free, for a term of years.

Capt. C. S. L. Hertzberg, of the Canadian Engineers, C.E.F., son of A. L. Hertzberg, M.Can.Soc.C.E., Division Engineer, C.P.R., Toronto, was invested with the Military Cross by the King at Buckingham Palace, April 16.

Sir Thos. Tait, President, Fredericton & Grand Lake Coal & Ry. Co., was operated on in Montreal, April 8, for a gathering between his left eye and ear. On April 20 he was reported to be convalescing satisfactorily at the Ritz Carlton Hotel, Montreal.

S. J. Montgomery, who has resigned the position of City Passenger Agent, Canadian Northern Ry., Ottawa, has been appointed Manager for Ottawa and district, of the Manufacturers Life Insurance Co.

Walter Maughan, Assistant General Passenger Agent C.P.R., Montreal, has been appointed an honorary lieutenant-colonel in the Canadian Militia, in recognition of services in connection with the movement of troops for overseas service.

The Hon. Frank Cochrane, M.P., Minister of Railways, and Mrs. and Miss Cochrane, who have had an apartment in Washington for several weeks, were to go on to Atlantic City at Easter and are

expected to return to Canada early in May.

W. A. Griffith, formerly secretary to Manager, Natural Resources Department, C.P.R., Calgary, Alta., has been appointed Traffic Assistant, Gold Coast Government Ry., Secondee, West Africa, the appointment being practically for war purposes.

Lieut. Angus R. Sinclair, of the 92nd Highlanders, C.E.F., youngest son of Angus Sinclair, railway contractor, Toronto, while at the front early in April, was slightly wounded in the arm and knee by shrapnel and was taken to Le Touquet Hospital.

B. R. Hepburn, M.P. for Prince Edward, Ont., and formerly President, Ontario & Quebec Steamship Co., who is going overseas as Major of the Forestry Battalion, C.E.F., was entertained at a public dinner at Picton, Ont., recently and given an address and a wrist watch.



G. C. Briggs
Supervisor of Buildings, Eastern Lines, Canadian Northern Railway.

The engagement is announced of **G. A. Suckling**, son of **H. E. Suckling**, Treasurer, C.P.R., Montreal, to **Miss A. M. Angstrom**, daughter of **A. Angstrom**, Naval Architect, Canadian Northern Ry., Toronto. The wedding will take place early in May.

Mrs. W. B. Howard, wife of the District Passenger Agent, C.P.R., Toronto, died at St. John, N.B., Apr. 20. She had been ill for some time, and when Mr. Howard removed from St. John to Toronto a few months ago, she was unable to accompany him, but her death was not expected.

W. E. Mann, a civil engineer, who died at Edmonton, Alta., Mar. 30, from injuries received by falling down an elevator shaft at the Alberta Hotel on the previous evening, was formerly in Grand Trunk Pacific Ry. service as Branch Lines Engineer at Winnipeg, and Division Engineer, Edmonton, Alta.

George Blackbird, who died at the Royal Victoria Hospital, Montreal, March 30, aged 67, was in the G.T.R. service for many years, during which, among other positions, he was Locomotive Foreman at Allandale, Ont., Montreal and Richmond, Que. Since retiring a year or two ago he lived in Montreal. He was buried in Toronto.

William E. Germain, whose appointment as agent, G.T.R., Sarnia, Ont., was announced in our last issue, was born at Gananoque, Ont., Oct. 18, 1870, and entered G.T.R. service in 1888, since when he has been, to 1891, ticket clerk, Petrolia, Ont.; 1891 to 1893, operator, Watford, Ont.; 1897 to March 1916, agent, Alvinston, Ont.

David C. Paisley, who was appointed General Yardmaster, C.P.R., Windsor, Ont., recently, was born at Toronto, Feb. 16, 1881, and entered railway service in 1900, since when he has been, to 1906, switch tender, trainman and yardman, G. T.R.; Aug. 26, 1906, to Sept. 24, 1910, brakeman, C.P.R., London, Ont.; Sept. 24, 1910 to Dec. 20, 1915, conductor, C.P.R., London, Ont.

John Donald McMillan, who has been appointed acting Superintendent, Belleville Division, Ontario Lines, G.T.R., Belleville, was born in Eldon Tp., Ont., Apr. 5, 1858, and entered railway service in March 1876, since when he has been, to Aug. 1878, brakeman, Toronto & Nipissing Ry., Uxbridge and Sutton, Ont.; 1878 to 1910, conductor and rule instructor, G.T.R., Toronto and Belleville, Ont.; 1910 to Apr. 1, 1916, Trainmaster, Lindsay, Ont.

E. J. Wearing, whose appointment as General Agent, G.T.R., Central Vermont Ry. and Canadian Express Co., Liverpool, Eng., was mentioned in a previous issue, was born at Birkenhead, Eng., Nov. 12, 1872, entered G.T.R. service, Jan. 1, 1888, and has since served in all departments of the company's office at Liverpool. He visited Canada from Sept. to Nov., 1911, covering the chief points from Montreal to Prince Rupert, Vancouver and Victoria, in order to become personally acquainted with the handling of freight, passenger and express traffic.

J. L. Reycraft, Solicitor, Manitoba and Saskatchewan Divisions, C.P.R., was born in Orford Tp., Kent County, Ont., June 20, 1868, and was educated at Ridgetown Collegiate Institute and Osgoode Hall Law School, Toronto. He served his articles in Chatham, Ont., and was admitted to the bar in 1896, and practised in Ridgetown until Mar. 1913, when he was appointed Solicitor, Manitoba Division, C.P.R. In July, 1915, he was also appointed Solicitor for the Saskatchewan Division and now has charge of the company's legal business from Port Arthur, Ont., to the western boundary of the Saskatchewan Division.

Baron Shaughnessy's second son, **Capt. Hon. A. T. Shaughnessy**, was killed in action in France, about Apr. 2. He was born at Montreal Oct. 18, 1887, and after completing his education at McGill University, was for some little time in the C.P.R. Traffic Department, leaving there to join the brokerage firm of C. Meredith & Co. He joined the Victoria Rifles in Montreal in 1910, and enlisted for overseas service with the 60th Battalion in June, 1915, and was in command of Company A. He was married in 1912 and is survived by his widow and two children. About ten years ago he travelled round

the world, by the C.P.R., using only that company's steamships and railways. A requiem mass was held at St. Patrick's Church, Montreal, Apr. 19, attended by members of the family, representatives of the Dominion and British Governments, and of all the transportation interests in the city.

G. I. Evans, who has resigned as District Master Mechanic, Districts 3 and 4, Ontario Division, C.P.R., Toronto, has been appointed General Manager, Imperial Iron & Steel Works, Collingwood, Ont. He was born at Montreal in May, 1880, and entered C.P.R. service in Apr., 1900, since when he has been, to Mar., 1906, draughtsman; Mar., 1906, to July, 1910, Chief Draughtsman; July, 1910, to Aug., 1912, Mechanical Engineer; Aug., 1912, to May, 1915, Superintendent, Angus Locomotive Shops, all at Montreal; May, 1915, to Mar., 1916, District Master Mechanic, Districts 3 and 4, Ontario Division, Toronto.

Andrew Duncan Davidson, Land Commissioner, Canadian Northern Ry., Toronto, died at Rochester, Minn., Apr. 22, of acute stomach trouble and frequent hemorrhages. He was born at Glencoe, Ont., May 18, 1853, and entered land business in Minnesota, where he also engaged in banking, and was eventually appointed a Colonel by the State Governor for services in the settlement of Minnesota and Dakota. On his return to Canada in 1905, he was appointed Land Commissioner, Canadian Northern Ry., and has been closely associated with many of the Mackenzie and Mann interests. D. B. Hanna, Third Vice President, C.N.R., attended the funeral at Duluth, Minn.

X. H. Cornell, who has been appointed General Superintendent, Chicago and Alton Rd., Bloomington, Ill., was from 1900 to Dec. 1910, in G.T.R. service at Durand, Mich., first as Chief Dispatcher, then as Trainmaster, and from 1904, as Master of Transportation. From Dec. 1910, to Apr. 1912, he was Inspector of Transportation, Chicago and Alton Rd., and Toledo, St. Louis and Western Rd., Chicago, Ill., and from Apr. to Oct. 1912, was Superintendent of Transportation, same roads. From Oct. 1912, to June 1914, he was Superintendent of Transportation, Pere Marquette Rd., Detroit, Mich., returning to the Chicago and Alton Rd. as Master of Transportation, which position he occupied until his present appointment.

Lewis Ketcham Silcox, whose appointment as Mechanical Engineer, Illinois Central Rd., Chicago, Ill., was announced in our last issue, was born at Germantown, Pa., Apr. 30, 1886, and educated at Trinity School, New York, and at the Institute of Mechanical and Electrical Engineering, Brussels, Belgium. From 1903 to 1906, he was an apprentice, New York, New Haven & Hartford Rd., High Bridge, N.Y.; 1907 to 1909, machinist and assistant superintendent in charge of foundries and machine shops, McSherry Mfg. Co., Middletown, Ohio; 1912 to Apr. 1, 1916, Shop Engineer, Canadian Car & Foundry Co., Montreal, and latterly Mechanical Engineer, Canadian Northern Ry., Toronto.

Charles Ketchum Howard, whose appointment as Commercial Agent, Canadian Government Railways, Boston, Mass., was announced in our last issue, was born at St. Andrews, N.B., Aug. 28, 1877, and entered railway service in Apr. 1893, since when he has been, to 1900, operator and agent, at various points, Atlantic Division, C.P.R.; 1900 to 1901, agent, C.P.R., Brownville Jct., Me.; 1901

to 1906, agent, C.P.R., McAdam Jct., N. B.; 1906 to 1910, agent, C.P.R., Fredericton, N.B.; 1910 to 1911, Superintendent, Aroostook Valley Rd., Presque Isle, Me.; 1911 to 1912, Travelling Freight Agent, C.P.R., St. John, N.B.; 1912 to 1915, Right of Way Agent, St. John and Quebec Ry., Fredericton, N.B.; 1915 to Mar. 1916, agent, Canadian Government Railways, Woodstock, N.B.

W. G. Manders, whose appointment as General Freight Agent, Western Lines, Canadian Northern Ry., Winnipeg, was announced in our last issue, was born at Owen Sound, Ont., July 24, 1876, and entered railway service in Apr. 1897, since when he has been to Feb. 1901, clerk and stenographer, Local Freight Office, C.P.R., Owen Sound, Ont.; Feb. to July 1901, chief clerk, Local Freight Office, C.P.R., Fernie, B.C.; July 1901 to Dec. 31, 1903, clerk, General Freight Office, Canadian Northern Ry., Winnipeg; Jan. 1, 1904, to Jan. 1, 1907, chief clerk in charge of loss and damage and overcharge freight claims, General Freight Office,



E. J. Wearing
General Agent, Grand Trunk Railway System,
Liverpool, England.

C.N.R., Winnipeg; Jan. 1, 1907, to May 1, 1909, chief clerk, Freight Traffic Department, C.N.R., Winnipeg; May 1, 1909, to Feb. 29, 1916, Assistant General Freight Agent, C.N.R., Winnipeg.

David H. Williams, who was appointed Assistant to General Manager, Canadian Government Railways, Moncton, N.B., recently, was born at Toronto, June 22, 1879, and entered railway service, Aug. 1, 1896, since when he has been to June 1, 1901, clerk, and chief clerk to Superintendent, C.P.R., Toronto; June 1, 1901, to Dec., 1902, clerk to General Superintendent, C.P.R., North Bay, Ont.; July, 1903, to Jan., 1905, chief clerk to Superintendent, C.P.R., White River, Ont.; Jan., 1905, to June, 1912, chief clerk to General Superintendent, C.P.R., North Bay, Ont.; June to Dec., 1912, Traffic Manager, Canada Cement Co., Montreal; Dec., 1912, to June, 1913, Superintendent, National Transcontinental Ry., Cochrane, Ont.; June, 1913, to Jan., 1916, chief clerk to

General Manager, Canadian Government Railways, Moncton, N.B.

C. A. Cotterell, who has been appointed Superintendent, District 2, Alberta Division, C.P.R., Lethbridge, was born at Enden, Eng., Jan. 18, 1877. He entered C.P.R. service as a messenger boy at Montreal in June 1888, and in Feb. 1894 was appointed an operator on the Farnham Subdivision, south of Montreal, and until 1898 occupied various positions as operator, relieving agent and station agent on the Eastern Lines, after which he was transferred to the Crowsnest Subdivision and acted as agent at various points and as dispatcher at Cranbrook, B.C. until 1901, when he was transferred to Fort William, Ont., as dispatcher, and subsequently served in that capacity at various points on the Western Lines, and as Chief Dispatcher at Fort William, Ont., Regina and Saskatoon, Sask., and Revelstoke, B.C.; as Trainmaster at Revelstoke, B.C.; Terminal Trainmaster, Vancouver, B.C.; acting Superintendent at Revelstoke, Nelson and Vancouver, B. C., until Sept. 1, 1913, when he was appointed Superintendent, District 2, British Columbia Division, Vancouver, which position he held to Apr. 1, the date of his present appointment.

Dominion Aid Toward Railway Construction.

A series of questions as to grants in aid of the Canadian Pacific, Canadian Northern and Grand Trunk Railways were answered in the House of Commons, recently, by Mr. Blondin. The answers given contained the following facts:—

Canadian Pacific Ry.—Total money paid out by way of subsidy, \$30,369,374.70. Land granted, main line, 18,206,986 acres; Souris Branch, 1,408,704 acres; Pipestone extension, 200,320 acres; total, 19,816,010 acres. Total amount of guaranteed issues, £3,093,700. This obligation was assumed direct by the Government in Dec., 1906.

Canadian Northern Ry.—Total money paid out by way of subsidy, \$26,155,360.65. Total area of land granted by way of subsidy, 3,422,528 acres. Bond guarantees: Principal and interest of £1,923,287 of 3% 50 year bonds, authorized 1903; principal and interest of £1,622,586 19s 9d of 3½% 50 year debenture stock, authorized 1908; guarantee of securities to an amount not exceeding \$45,000,000 at 4%, of which amount £3,500,000 have been sold, the remainder being pledged for the purposes set out in the Act, authorized 1914; principal and interest of £7,493,935 12s 4d of 3½% 50 year debenture stock of the C. N. Ontario Ry., authorized 1911; principal and interest of £647,260 5s 6d 3½% 50 year debenture stock of the C. N. Alberta Ry., authorized 1910; principal and interest of £733,561 12s 6d 3½% 50 year debenture stock, N. C. Alberta Ry., authorized 1912.

Grand Trunk Ry.—Subsidy for Victoria Jubilee Bridge, Montreal, \$500,000. No grants of land were voted to the company, neither were there any guarantees of bonds or other issues of securities by the Dominion Government for the G.T.R.

We are officially advised that the rolling stock used on the Intercolonial Ry. and the National Transcontinental Ry. is all being lettered Canadian Government Railways, Intercolonial Division, or Transcontinental Division, as the case may be. The rolling stock on the Prince Edward Island Ry. remains as heretofore, for the present.

Flagging Rules for Impassable Track.

The Board of Railway Commissioners has passed general order 161, prescribing the following regulations for the uniform maintenance of way flagging rules for impassable track:—

1. When the track is found to be impassable due to any obstruction or defect, or before undertaking any work which will render it impassable, trackmen, bridgemen, or other employees of the company shall protect the same as follows:—

2. On all mountain subdivisions, by day, place a red flag supported on two staffs, with flag drawn out between them, at right angles to the track and 5 ft. above rail level; and in addition, by night, a red light on the same side of the track as the engineer of an approaching train, at a point 600 ft., in both directions, from the defective or working points, with two torpedoes placed on the rail, opposite each other, so as to cause but one explosion, 150 ft. in advance of the red signal. Such red signal shall be changed to green and the torpedoes removed as soon as the work will permit; and the said green signal shall be displayed until other protection signals are withdrawn; and send out a flagman in each direction with stop signals at least 1500 ft. in daytime, if there is no down grade towards the obstruction within one mile, and there is a clear view of 6000 ft. from an approaching train; 3600 ft. at other times and places, if there is no down grade towards the obstruction within one mile; 5400 ft. if there is a down grade towards the obstruction within one mile. The flagman must, after going the required distance from the obstruction to ensure full protection, take up a position where there will be an unobstructed view of him from an approaching train of, if possible, 1500 ft., first placing two torpedoes on the rail (not more than 200 nor less than 100 ft. apart), on the same side as the engineer of an approaching train, 300 ft. beyond such position. The flagman must display a red flag by day and a red light by night, and remain in such position until recalled or relieved.

3. On all main lines and on the portions of branch lines over which main line traffic is handled, send out a flagman in each direction with stop signals at least 1500 ft. in daytime, if there is no down grade towards the obstruction within one mile, and there is a clear view of 6000 ft. from an approaching train; 3600 ft. at other times and places, if there is no down grade towards the obstruction within one mile; 5400 ft. if there is a down grade towards the obstruction within one mile. The flagman must, after going the required distance from the obstruction to ensure full protection, take up a position where there will be an unobstructed view of him from approaching train of, if possible, 1500 ft., first placing two torpedoes on the rail (not more than 200 nor less than 100 ft. apart), on the same side as the engineer of an approaching train, 300 ft. beyond such position. The flagman must display a red flag by day and a red light by night, and remain in such position until recalled or relieved.

4. On all other branch lines (a) a flagman must be sent out in each direction, who shall place a red flag supported on two staffs, with flag drawn out between them, at right angles to the track and 5 ft. above rail level; and in addition a red light by night, on the same side of the track as the engineer of an approaching train, at a point 600 ft. from the defective

or working point, with two torpedoes placed on the rail opposite each other, so as to cause but one explosion, 150 ft. in advance of the red signal. Such red signal shall be changed to green and the torpedoes removed as soon as the work will permit, and the said green signal shall be displayed until other protection signals are withdrawn; and provide further protection as follows: (b) By day, place a flag supported on two staffs, with flag drawn out between them, at right angles to the track and 5 ft. above rail level; and in addition a red light by night, on the same side of the track as the engineer of an approaching train, so that it will be clearly in his view at least 3600 ft. from the defective or working point, if there is no down grade towards the obstruction; 5400 ft. if there is a down grade within one mile of the obstruction, or as much further as may be necessary to ensure full protection. (c) Place two torpedoes (not more than 200 ft. nor less than 100 ft. apart) on the rail on the same side as the engineer of an approaching train, 300 ft. in advance of the red signal.

5. Trains stopped by flagman, as per rule 2, shall be governed by his instructions and proceed to the working point signal and there be governed by signal or instructions of the foreman in charge, unless in the meantime stop signal has been removed and proceed signal displayed.

6. Trains stopped by flagman, as per rule 3, shall be governed by his instructions and proceed to the working point, and there be governed by signal or instructions of the foreman in charge.

7. Train stopped by flagman, as per rule 4, shall replace the torpedoes exploded and proceed to the working point signal, and from there shall be governed by the signal or instructions of the foreman in charge, unless in the meantime stop signal has been taken down and proceed signal displayed.

8. In the event of a train order protection being provided, yellow flags by day and, in addition, yellow lights by night may be used as markers without torpedoes on the rail, placed 3600 ft. from the defective or working point, and in addition red signals, in both directions, 600 ft. from the defective or working point.

9. When weather or other conditions obscure day signals, night signals must be used in addition.

The foregoing rules are to be printed in the railway companies' working time-tables for the guidance of enginemen and trainmen.

Canadian Freight Association, Eastern Lines.

The annual meeting of the association was held at Montreal, Apr. 13, when the standing committees were elected for the current year, as follows:—Advisory—G. H. Shaw, C. E. Dewey, H. E. Macdonell and J. H. Meglemry; Executive—H. E. Macdonell, F. F. Backus, G. Tombs and H. C. Martin; Classification—H. E. Macdonell, G. Tombs, F. J. Watson, E. N. Todd, L. Macdonald, A. O. Secord, G. T. Pettigrew, M. H. Brown, R. E. Perry and James Edward; Freight Inspection—R. W. Long, F. A. Shaw, M. H. Brown, R. W. Youngs, R. J. S. Weatherston, Jas. Edward, G. H. Clark, W. B. Bamford, W. S. Elliott and G. C. Martin.

Proposed Removal of Car Building Plant.

Representatives of the Russian Government have secured an option on the Canadian Car & Foundry Co.'s plant at Fort William, Ont., for a sum in the neighborhood of \$2,500,000, the intention being, if a purchase is effected, to remove it to Russia. The purchase would include the entire plant, buildings and machinery, and everything used in the construction, particularly the steel work, with the exception of the concrete, brick and hollow tile work, together with the machinery, would be removed to Russia and re-erected there. Russia is very short of railway rolling stock and to partly supply the deficiency has, since war began, ordered 20,000 freight cars in the United States and 2,000 in Canada, delivery of which is being made in knock down form at Vladivostok, where it is to be erected. The Russian Government wants shops there for erection purposes and also for building further rolling stock, and as the Fort William plant is considered the last word in car works construction, it is believed the purchase would be an advantageous one for the Russian Government, and would enable it to obtain the necessary structural steel, etc., much more quickly than from any other source.

The Fort William plant has a capacity of from 50 to 60 cars a day, but has not been operated owing to war conditions. W. W. Butler, Vice President, and K. W. Blackwell, another of the Canadian Car & Foundry Co.'s directors, met the Fort William City Council on April 19 in regard to the matter, when the councillors put themselves on record as being opposed to the plant's removal, although the company is willing to undertake to re-erect it after the war's conclusion.

The Dominion has already assisted Russia by letting it have two icebreaking steamships, and a Fort William icebreaking tug, the J. T. Horne, was sent to Archangel last year. The transfer of the Fort William car building plant would be in line with the policy in regard to icebreaking steamships and would undoubtedly be of great assistance to our Russian allies. It is hoped that Fort William's objections will be got over. If they are not, there is of course the possibility of the plant being commandeered by Government action.

Grain Inspection at Western Points.

The following figures issued by the Department of Trade and Commerce, show the number of cars of grain inspected at Winnipeg and other points on the Western Division for railways, for March, and for seven months ended Mar. 31, with a comparison of the number of cars inspected for seven months ended Mar. 31, 1915.

	March	Seven months to Mar. 31, 1916	Seven months to Mar. 31, 1915
C.P.R.	10,784	126,854	48,966
C.P.R. Calgary	1,600	4,886	5,195
C.N.R.	7,112	65,807	32,279
G.N.R. Duluth	1,081	4,177	1,262
G.T.P.R.	5,220	31,691	12,870
Totals	22,797	232,434	100,572

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater for February, as follows: Superior, 602.44; Michigan and Huron, 579.57; Erie, 571.99; Ontario, 245.41. Compared with the average February levels for the past ten years, Superior was 0.70 ft. above; Michigan and Huron, 0.53 ft. below; Erie, 0.31 ft. above, and Ontario, 0.31 ft. below.

Canadian Railway AND Marine World

ESTABLISHED 1898

Devoted to Steam and Electric Railway,
Marine, Express, Telegraph, and Railway and Canal
Contractors' Interests.

Official Organ of various Canadian Transportation
Associations.

Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C.E.
Managing Director and Editor-in Chief.

AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editors
JOHN KEIR AND DONALD F. KEIR

Canadian Business Representative,
W. H. HEWITT, 70 Bond Street, Toronto

United States Business Representative,
A. FENTON WALKER, 143 Liberty St., New York

European Business Representative,
J. MEREDITH MCKIM, 16 Regent St., London, Eng.

Authorized by the Postmaster General for Canada,
for transmission as second class matter.

Entered as second class matter, July 25, 1913, at the
Postoffice at Buffalo, N.Y., under the Act of Congress
of March 3, 1879.

SUBSCRIPTION PRICE, including postage any-
where, \$2 a year.

SINGLE COPIES, 20 cents each, including postage.

The best and safest way to remit is by express money
order. Where one cannot be obtained, a post office
money order, or bank draft, payable at par in Toronto,
may be sent. Cheques or drafts not payable at par in
Toronto cannot be accepted. Remittances should be
made payable to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by
the 10th of the month preceding the date of publication.

TORONTO, CANADA, MAY, 1916.

PRINCIPAL CONTENTS.

Appointments.....	190
Birthdays of Transportation Men.....	172
Board of Railway Commissioners,—	
Orders by, Summaries of.....	192
Traffic Orders.....	179
Book Reviews.....	211
Canadian Government Railways, Construction, etc., Mileage Operation, etc.....	180
Canadian Northern Ry. Construction.....	178
Cars for French Railways.....	173
Electric Railway Department.....	193 to 201
Brantford Municipal Ry. Report.....	199
Car Equipment, Recent Developments.....	193
Dominion Power & Transmission Co.'s Report.....	197
Finance, Meetings, etc.....	199
Hydro Electric Railway Projects in Ontario Notes.....	195
Personal.....	201
Projects, Construction, etc.....	198
St. John Ry. Report.....	200
Toronto Suburban Ry., Lambton Car Barn Office Building.....	196
Express Companies' Statistics.....	194
Grain in Store at Terminal Elevators.....	212
Mainly About Railway People.....	188
Marine Department.....	186
Dominion Marine Association and U. S. Seamen's Act.....	202 to 211
Icebreaking Steamships for St. Lawrence River.....	211
Personal.....	202
Prince Edward Island Steamship Service.. St. Lawrence & Chicago Steam Navigation Co.'s Absorption.....	208
Railway Development.....	205
Railway Earnings.....	204
Railway Finance, Meetings, etc.....	182
Railway Mechanical Methods and Devices.....	188
Railway Rolling Stock Notes.....	175, 176
Railway Statistics.....	188
Rogers Pass Tunnel Construction.....	174
Telegraph Tolls Judgment.....	169, 183
Track Work, Spring and Summer.....	211

Lacombe & Blindman Valley Electric
Ry.—We are officially advised that the
company has no definite plans as to fur-
ther construction this year.

Saskatoon Municipal Ry.—Revenue for
March, \$17,690.02; operating and over-
head charges, \$15,177.55; profit, \$2,512.47.
Passengers carried, 344,933, against 237,-
787 for Mar. 1915.

The Immensity of the Transporta- tion Interests.

Sir Henry L. Drayton, K.C., Chief Rail-
way Commissioner for Canada, in giving
judgment in March, 1916, on the question
of freight rates on tank and still struc-
tural material from Sarnia to Regina,
said: "There is, of course, another public
interest to be considered, that is, the
transportation interest, possibly repre-
senting, next to the great agricultural
industry of the country, the largest public
interest."

Algoma Central and Hudson Bay Railway Settlement.

A special general meeting of share-
holders at Sault Ste. Marie, Ont., on Mar.
28 ratified a scheme of arrangement be-
tween the company and its creditors,
approved all the steps taken to put the
scheme into effect, and took the necessary
steps to complete and carry out the ar-
rangement.

The company has been in the hands of
receivers for some time pending the ar-
rangement of its finances. This was
finally agreed to and was approved by
the Exchequer Court Feb. 28. The ar-
rangement affects the A.C. & H.B. Ry.
and the Algoma Central Terminals,
Limited, and covers the adjustment of
relations between these two companies;
"the modification and compromise of the
rights of the holders of the bonds of the
companies in respect of the mortgages
respectively securing the same and the
rights of each class of bondholders in
respect of the other for reducing the
existing preference shares of the railway
company from \$5,000,000 to \$2,000,000,
and creating and issuing a new class of
preference shares to the amount of \$3,-
000,000, having rights similar to the pres-
ent issue, and for the formation of a
bondholders' committee and the transfer
to it of the common stock of the said
companies and vesting in it certain rights
and power." This arrangement was ap-
proved by the Dominion Parliament Mar.
14.

In connection with the carrying out of
the arrangement, a meeting of the holders
of the railway company's 5% first mort-
gage 50 year gold bonds was called, to be
held in London, Eng., Mar. 24. Resolu-
tions were submitted to sanction the
scheme of arrangement and readjust-
ment; for the formation of a bondholders'
committee; for the payment of moneys
held by the terminals receiver and the
Supreme Court Accountant to the bond-
holders' committee under conditions set
forth in the agreement; for the payment
of interest on the railway bonds from
June 1, 1914, and interest and sinking
fund on the terminals bonds only if the
joint net earnings permit; for the pre-
servation of the guarantee of the Lake
Superior Corporation endorsed on the
railway bonds, such guarantee not to be
enforced by any single bondholder so long
as the bondholders' committee exists; for
reducing certain preference shares now
outstanding of the value of \$5,000,000 by
60%, and creating a new class of prefer-
ence shares to be distributed three-fourths
to the railway bondholders and one-fourth
to the Terminal Co. bondholders pari
passu; for the exercising of voting pow-
ers of the railway; for the conversion of
the second mortgage bonds of the com-
pany into income bonds; for the modifi-
cation of the lease of the terminals to
the railway company for the operation of
the railways and terminals companies by

two boards of directors and a General
Manager; for the payment of unsecured
creditors, and other necessary detail pur-
poses.

The Dominion Parliament has con-
firmed the agreement between the A.C. &
H.B. Ry., the Algoma Central Terminals,
Limited, and the shareholders and bond-
holders of the company respectively, and
giving power to the companies to carry
out all the terms of the agreements. The
proclamation of the Governor General in
Council, which may be issued upon evi-
dence being produced satisfactory to the
Minister of Railways that he scheme of
arrangement has been properly approved
by the shareholders of the several com-
panies. The scheme of arrangement is
fully set forth in the schedule of the act.

Tests of British Columbia Ties in England.

Canadian Railway and Marine World
for March contained the results of tests
of Douglas fir and red cedar ties from
British Columbia made by the Great
Eastern Ry. of England. We now have
a report on the use of British Columbia
Douglas fir ties on the Great Western Ry.
of England, which is also very satisfac-
tory. The tests on these two great Eng-
lish railways are especially important as
convincing testimony of the work of Brit-
ish Columbia ties for South African,
Indian and Chinese railways, which are
practically controlled by English engin-
eers. The Great Western report follows:

Date placed—May 1, 1898.

Date reported—Sept. 26, 1914.

Time of service—Still in line.

Distance—Down Main Line, 78 m. 8 c. and 78 m.

31 c.

Number of ties—616.

Subgrade soil—Marl and gravel, embankment.

Kind of ballast—Crushed.

Drainage—Good.

Whether ties have been used with spikes or
soleplates for flat bottom rail road; or with chairs
for bull headed rail road—Chairs for bull headed
road.

Rail—92 lbs. per yard, bull headed.

Ties per mile of track—2,142.

Average curve and maximum curve—On curve
of 200 chains radius.

Average grade and maximum grade—1 in 1,660,
falling.

Traffic, tons per annum—Approximately 15,000,-
000.

Kind of wood—Douglas fir.

Size—9 ft. x 10 in. x 5 in.

Class—Highest.

Sawn or hewn—Sawn.

Kind of treatment—Creosoted.

Absorption of preservative per cubic foot—0.8 of
a gallon.

Seasoning—Only kept in stock 9 weeks before
being creosoted as they were dry when received.

Condition of ties at last inspection—Very good,
considering they had actually been in line 16 years
and 5 months.

Number removed—On account of decay, 23; me-
chanical wear, nil; other causes, nil; total number
removed, 23.

Average life—Still in line, present life 17½ years.

Press reports emanating from Mont-
real state that Canada Steamship Lines
Ltd. is purchasing all the steamships,
suitable for freight purposes, which are
offering, that several vessels which have
been running out of Ogdensburg, N.Y.,
have been acquired, and that several
vessels which were not in use last year
for passenger purposes, are being fitted
up for business this season.

George Bury, Vice President, C.P.R., is
reported to have stated at Vancouver
recently that the company had placed
orders in British Columbia for about
10,000,000 ft. of lumber, the principal por-
tion of which is to be used in building
freight cars at Angus Shops, Montreal.

The Canadian Locomotive Co. has ship-
ped 7 decapod locomotives, similar to
those illustrated and described in Cana-
dian Railway and Marine World for Janu-
ary, to the Russian Government.

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Algoma Central and Hudson Bay Ry.—T. F. RAHILLY, heretofore Travelling Auditor, has been appointed acting Trainmaster, vice W. M. Hugill, enlisted for active service. Office, Sault Ste. Marie, Ont.

Canada Steamship Lines, Ltd.—See under separate heading in Marine Department, pg. 204.

Canadian Northern Ry.—The Engineering Department, Eastern Lines, has been organized as follows:—Chief Engineer, A. F. STEWART; Assistant Engineer, R. A. BALDWIN; Assistant Engineer, E. W. OLIVER; Bridge Engineer, W. P. CHAPMAN; Supervisor of Buildings, G. C. BRIGGS; Chief Draughtsman, W. H. ARMS. The Chief Engineer has charge of all engineering matters, the prescribing of standards and will be in direct charge of new work or special assignments of work not otherwise delegated to the Division officers. All maintenance of way work, including ordinary maintenance of way and structures, continues to be handled under the jurisdiction of the division officers as heretofore. Offices, Toronto.

L. W. BULLER, heretofore agent, has been appointed General Agent, Ottawa, with jurisdiction over the Ottawa Terminal. His duties include those previously carried out by G. A. Hoag, as Assistant Superintendent.

I. G. REECE, heretofore Travelling Passenger Agent, Toronto, has been appointed City Passenger Agent, Ottawa, vice S. J. Montgomery, resigned to enter private business.

G. A. HOAG, heretofore Assistant Superintendent, Ottawa, has been appointed Assistant Superintendent, Toronto District, Ontario Division, vice W. J. Curle, whose appointment as General Superintendent, Chatham, Wallaceburg & Lake Erie Ry., was announced in our last issue. Office, Trenton, instead of Rose-dale, Toronto, where the Assistant Superintendent's office was previously located.

H. D. CAMERON, heretofore chief draughtsman, Winnipeg, has been appointed Mechanical Engineer, Toronto, vice L. K. Silcox, whose resignation to enter Illinois Central Rd. service was announced in our last issue.

W. H. LONG, heretofore Car Foreman, Trenton, Ont., has been appointed General Car Foreman, Ontario Division. Office, Toronto.

R. C. GADSBY, heretofore Soliciting Passenger Agent, Toronto, has been appointed Travelling Passenger Agent there, vice I. G. Reece, promoted.

H. J. LeCLAIR, heretofore City Ticket Agent, Toronto, has been appointed Soliciting Passenger Agent there, vice R. C. Gadsby, promoted.

F. G. WARD has been appointed City Ticket Agent, Toronto, vice H. J. LeClair, promoted.

F. L. WILLIS has been appointed Night Locomotive Foreman at Dauphin, Man.

Canadian Pacific Ry.—R. E. HALL, heretofore Storekeeper, North Bay, Ont., has been appointed Storekeeper, Angus Shops, Montreal.

R. V. NICHOLSON, heretofore Bridge and Building Master, Schreiber, Ont., has been appointed Bridge and Building Mas-

ter, Ottawa, Ont., vice F. O'Hara, deceased.

T. H. HAMILTON, heretofore locomotive driver, West Toronto, has been appointed District Master Mechanic, Districts 1, 3 and 4, Ontario Division, vice G. I. Evans, on leave of absence. Office, Toronto.

J. JARRETT, heretofore Storekeeper, Chapleau, Ont., has been appointed Storekeeper, North Bay, Ont., vice R. E. Hall, transferred.

S. A. POTTLE has been appointed Storekeeper, Chapleau, Ont., vice J. Jarrett, transferred.

N. BERGER has been appointed Roadmaster with territory from White River to Schreiber, Ont. Office, Schreiber, Ont.

J. COUGHLIN has been appointed Roadmaster with territory from Schreiber to Port Arthur, Ont. Office, Schreiber, Ont.

R. A. McPHERSON has been appointed Locomotive Foreman, Ignace, Ont., vice A. J. Pentland, transferred.

J. A. MacARTHUR has been appointed Superintendent, District 1, Manitoba Division, vice A. Halkett, transferred. Office, Kenora, Ont.

F. SADLIER, heretofore Shop Foreman, Revelstoke, B.C., has been appointed District Master Mechanic, Fort William, Ont., vice G. Twist, transferred.

A. J. PENTLAND, heretofore Locomotive Foreman, Ignace, Ont., has been appointed Locomotive Foreman, Souris, Man., vice H. J. Reed, transferred.

G. TWIST, heretofore District Master Mechanic, Fort William, Ont., has been appointed District Master Mechanic, Winnipeg, vice A. Brown, transferred.

J. D. MUIR, heretofore Locomotive Foreman, Medicine Hat, Alta., has been appointed Locomotive Foreman, Winnipeg, vice G. Pratt, transferred.

H. B. JACKSON, heretofore Manager, Empress Hotel, Victoria, B.C., has been appointed Manager, Royal Alexandra Hotel, Winnipeg, vice J. J. McGuire, who has left the service.

G. C. GIBSON, heretofore Locomotive Foreman, Strathcona, Alta., has been appointed Locomotive Foreman, Saskatoon, Sask., vice C. A. Perry, transferred.

A. HALKETT, heretofore Superintendent, District 1, Manitoba Division, Kenora, Ont., has been appointed Superintendent, District 2, Saskatchewan Division, vice H. H. Boyd, transferred. Office, Moose Jaw.

W. J. RENIX, heretofore District Master Mechanic, District 1, British Columbia Division, Revelstoke, has been appointed District Master Mechanic, Moose Jaw, Sask.

G. PRATT, heretofore Locomotive Foreman, Winnipeg, has been appointed Locomotive Foreman, Strathcona, Alta., vice G. C. Gibson, transferred.

C. A. COTTERELL, heretofore Superintendent, District 2, British Columbia Division, Vancouver, has been appointed Superintendent, District 2, Alberta Division, vice F. Walker, who is on leave owing to illness. Office, Lethbridge.

C. A. PERRY, heretofore Locomotive Foreman, Saskatoon, Sask., has been appointed Locomotive Foreman, Medicine Hat, Alta., vice J. D. Muir, transferred.

JAMES McGOWN, Jr., heretofore machinist, has been appointed Locomotive Foreman, Rogers Pass, B.C., vice J. W. Jackson, transferred.

J. A. REID, heretofore Locomotive Foreman, Souris, Man., has been appointed Locomotive Foreman, Cranbrook, B.C.,

vice D. G. MacDonald, who, at his own request, has resumed work at the bench, at Lethbridge, Alta.

A. BROWN, heretofore District Master Mechanic, Winnipeg, has been appointed District Master Mechanic, District 1, British Columbia Division, Revelstoke, vice W. J. Renix, transferred.

W. J. BARBER, heretofore acting Locomotive Foreman, North Bend, B.C., has been appointed Locomotive Foreman, Revelstoke, B.C., vice F. D. Warner, transferred.

R. QUINN, heretofore in Winnipeg shops, has been appointed Shop Foreman, Revelstoke, B.C., vice F. W. Sadlier, transferred.

F. D. WARNER, heretofore Locomotive Foreman, Revelstoke, B.C., has been appointed Locomotive Foreman, Nelson, B.C., vice W. Pitts, superannuated.

J. W. JACKSON, heretofore Locomotive Foreman, Rogers Pass, B.C., has been appointed Locomotive Foreman, Kamloops, B.C., vice John Macrae, acting Locomotive Foreman, transferred.

JOHN MACRAE, heretofore acting Locomotive Foreman, Kamloops, B.C., has resumed his former position as Locomotive Foreman, North Bend, B.C.

C. HOOD, heretofore Trainmaster, Grand Forks, B.C., has had his headquarters transferred to Nelson, B.C.

J. HOLLONQUIST, heretofore Roadmaster, Moose Jaw, Sask., has been appointed Roadmaster, with territory from North Bend to mileage 110, Cascade Sub-division, B.C., vice J. Esslemont, deceased. Headquarters, Mission, B.C.

H. H. BOYD, heretofore Superintendent, District 2, Saskatchewan Division, Moose Jaw, has been appointed Superintendent, District 2, British Columbia Division, vice C. A. Cotterell, transferred. Office, Vancouver.

W. H. DEACON has been appointed Travelling Passenger Agent, Vancouver, B.C., vice F. H. Daly.

A. BENAGLIA has been appointed acting Manager, Empress Hotel, Victoria, B.C., vice H. B. Jackson, transferred.

C. E. PHELPS, heretofore Travelling Passenger Agent, New York, has been appointed City Passenger Agent, Washington, D.C. Office, 1419 New York Ave.

A. G. BROOKER has been appointed Travelling Passenger Agent, New York, vice C. E. Phelps, promoted. Office, 1231, Broadway.

G. J. WEIDMAN, heretofore City Passenger Agent, Washington, D.C., has been appointed City Passenger Agent, Cleveland, Ohio.

H. M. BEYERS has been appointed City Passenger Agent, Spokane, Wash.

D. C. O'KEEFE has been appointed City Passenger Agent, Tacoma, Wash., vice C. H. Naylor.

Grand Trunk Ry.—R. E. ORR, heretofore dispatcher, Belleville, Ont., has been appointed acting Trainmaster, Districts 8, 9 and 10, Belleville Division, vice J. D. McMillan, assigned to other duties. Office, Lindsay, Ont.

J. D. McMILLAN, heretofore Trainmaster, Lindsay, Ont., has been appointed acting Superintendent, Belleville Division, comprising Districts 5, 6, 7, 8, 9 and 10, Ontario Lines, vice H. F. Coyle, on leave of absence on account of illness. Office, Belleville.

J. S. CARRUTHERS has been appointed City Passenger Agent, Prescott, Ont., during the absence of P. B. Whiteley, who has enlisted for overseas military service.

J. R. MELVILLE, heretofore chief

clerk to Vice President Dalrymple, Montreal, has been appointed General Agent, Passenger Department, Toronto. This is a new position.

R. E. NEWCOMER, heretofore in office of General Manager, Wabash Ry., has been appointed Trainmaster, Districts 17, 18, 19 and 24, London Division, G.T.R., vice W. J. Durkin, who has resigned and at his own request been assigned to train service. Office, London, Ont.

The following station agents have been appointed:—Millbrook, Ont., P. Stinson; Seagrave, Ont., A. J. Dance; Madawaska, Ont., F. D. O'Connor; Pottersburg, Ont., outside agency, J. M. Duncan.

Grand Trunk Pacific Ry.—C. N. McMATH has been appointed Car Inspector, Transcona, Man., vice N. C. Hopper, who has enlisted for overseas military service.

S. M. GREENE, heretofore City Passenger and Ticket Agent, Saskatoon, Sask., has been appointed City Passenger and Ticket Agent, Regina, Sask., vice G. Powell, promoted.

J. J. RALEIGH, heretofore Mixed Train Agent, Smithers, B.C., has been appointed Agent, Ketchikan, Alaska.

J. D. McAULEY, heretofore Chief Clerk to Commercial Agent, Regina, Sask., has been appointed Travelling Freight and Passenger Agent, Juneau, Alaska.

GORDON POWELL, heretofore City Passenger and Ticket Agent, Regina, Sask., has been appointed Freight and Passenger Agent, Skagway, Alaska.

The following station agents have been appointed:—Central Butte, Sask., A. Jackson; Gilroy, Sask., W. G. Stimpson.

Great Northern Ry.—G. H. SMITTON, Assistant General Freight Agent, Portland, Ore., is reported to have been appointed Assistant Traffic Manager, St. Paul, Minn., vice H. A. Jackson, transferred to Great Northern Pacific Steamship Co.'s service.

H. H. BROWN, heretofore Assistant General Freight Agent, St. Paul, Minn., has been appointed General Freight Agent there. This is a new position.

F. H. PARKER, heretofore Assistant Comptroller, St. Paul, Minn., has been appointed Assistant General Freight Agent, St. Paul, Minn., vice H. H. Brown, promoted.

P. B. BEIDELMAN, heretofore General Agent, Refrigerator Service, has been appointed Assistant General Freight Agent, St. Paul, Minn., vice W. J. Power, resigned.

H. COSTIGAN is reported to have been appointed General Agent, Freight Department, Seattle, Wash., vice R. K. Pretty, transferred.

R. K. PRETTY, General Agent, Freight Department, Seattle, Wash., is reported to have been appointed Assistant General Freight Agent, Portland, Ore., vice G. H. Smitton, promoted.

Great Northern Pacific Steamship Co.—H. A. JACKSON, heretofore Assistant Traffic Manager, Great Northern Ry., St. Paul, Minn., has been appointed General Traffic Manager, G.N.P.S.Co., vice C. E. Stone. Office, San Francisco, Cal.

Illinois Central Rd.—G. B. WYLIE, heretofore Travelling Passenger Agent, Buffalo, N.Y., has been appointed Travelling Passenger Agent, Chicago, Ill.

Minneapolis, St. Paul & Sault Ste. Marie Ry.—C. E. PHELPS has been appointed City Passenger Agent, Washington, D.C., vice G. J. Weidman.

New York Central Rd.—G. H. CLARK, Division Freight Agent, has had his jurisdiction extended to include stations on the extension from Cornwall to Ottawa, Ont. Office, Ottawa.

Northern Navigation Co.—C. LEIDICH has been appointed District Passenger Agent, 69 Fort St. West, Detroit, Mich.

A. RAY LAWRENCE has been appointed District Passenger Agent, 733 Euclid Ave., Cleveland, Ohio.

Lake and Rail Rate Cancellations Forbidden.

The Interstate Commerce Commission has given the following decision:—Tariffs of the Grand Trunk, designated as Supplement 16 to I. C. C. 1535, Supplement 10 to I. C. C. 2110, and I. C. C. 2297, filed to become effective Sept. 15, 1915, proposed to cancel the joint class and commodity rates on traffic from Duluth, Minn., and other ports at the head of Lake Superior to points in eastern trunk line territory, published in connection with the Port Huron & Duluth Steamship Co., which operates a line of boats between Port Huron, Mich., and Duluth, Minn. By tariff of the Chicago, St. Paul, Minneapolis & Omaha Ry., designated as Supplement 23 to I. C. C. 3868, filed to become effective Oct. 8, 1915, cancellation was proposed of joint rail-lake-and-rail commodity rates published in connection with the same boat line from Minneapolis, Minn., and other points to eastern trunk line territory. By orders of the commission the tariffs were suspended until July 13, 1916, pending investigation. Cancellation of the joint rates would leave in effect combination rates only, with the result that through freight charges via the Port Huron & Duluth Steamship Co.'s line would be materially increased. The evidence shows that the tariffs filed by the G.T.R., are the result of a dispute with the rail lines east of Buffalo over the divisions of the joint rates claimed by such rail lines. The Chicago, St. Paul, Minneapolis & Omaha did not appear at the hearing, and no evidence was offered in support of its tariff.

The Port Huron & Duluth Steamship Co. is a common carrier, entirely independent of railway ownership. At Duluth it connects with rail lines which serve Minneapolis and other interior points. At Port Huron traffic is interchanged with the G.T.R., whose lines connect at Buffalo with the eastern trunk lines. Through routes and joint rates via these lines, excepting the Pennsylvania east of Buffalo, have been in effect for many years; the freight tonnage over the water line during the season of navigation is considerable, and there is public demand for the continuance of such through routes and joint rates.

The question of through routes and joint rates in connection with the Pennsylvania east of Buffalo was before the commission in a recent case, and we held that such routes and rates should be established and maintained for two years, and that the rates should not exceed as maxima the joint rates in effect via other rail-and-lake and rail-lake-and-rail routes. Port Huron & Duluth Steamship Co. v P. R. R. Co., 35 I. C. C., 475. Portions of the evidence in that case were introduction and filed in this proceeding. On the record we have no doubt that the public interests will be best served by a continuance of through routes and joint rates, and we find nothing in the evidence to justify the cancellations proposed. The mere fact of disagreement between the carriers as to divisions does not prove that the joint rates are unreasonable, or that the routes over which they are applied should be abandoned. We hold that the proposed cancellations have not been

justified and that the suspended tariffs should be cancelled and that the through routes and joint rates applicable thereto should be maintained. It will be so ordered. The carriers should make further endeavor to agree upon the divisions of such joint rates, and if they cannot so agree they should present the question of divisions to the Commission in a supplementary proceeding.

H. C. Martin, General Freight Agent, G.T.R., represented that company at the hearing.

Reid Newfoundland Co's Railway Operations.

The operations of the Reid Newfoundland Co.'s railways for the year ended June 30, 1915, show the following results:

Earnings.		1914-1915.	1913-1914.
Passenger traffic		\$301,401.04	\$354,657.56
Freight traffic		382,510.00	311,175.61
Mails		53,370.21	50,865.06
Other sources		54,305.50	63,549.12
		\$691,586.75	\$782,247.35
Operating Expenses.		1915.	1914.
Maintenance of lines, build- ings, etc.		\$174,253.29	\$161,796.53
Operation and repairs of locomotives		283,465.93	321,932.77
Repairs of cars		66,843.41	75,210.70
General		375,475.63	430,275.28
		\$900,038.26	\$989,215.28
Operating Results for Five Years.		Earnings.	Expenses.
1911		\$626,303.56	\$663,771.29
1912		633,797.91	766,920.49
1913		740,231.88	875,862.08
1914		782,247.35	989,215.28
1915		691,586.75	900,038.26
		Freight Carried	Deficit.
		1914-1915	1913-1914
		lbs.	lbs.
Flour		50,581,800	34,506,760
Live stock		2,700,000	2,956,610
Lumber		60,555,890	52,431,470
Fish		9,266,610	13,071,660
Manufactured goods		3,113,710	3,181,120
Other articles		212,194,030	256,534,850
Totals		338,412,040	362,682,470

Quebec Bridge Construction Progress.

During the discussion of the estimates in the House of Commons recently, the acting Minister of Railways said: The car ferry Leonard is in service between Quebec and Levis and handling very satisfactorily the National Transcontinental and Intercolonial business. The car ferry was rendered necessary owing to the delay involved in this project by the collapse of the first Quebec bridge. Work is now progressing rapidly on the construction of the second bridge. On the north shore the entire cantilever arm has been completed, thus practically completing all the steel work on that side. On the south side the steel work has been completed up to and including the main post over the main pier. This year the south cantilever arm will be erected, and the work of erecting the suspended span will be commenced early in the spring at Sillery Cove and will be completed by the time the cantilever arm is ready to receive it. It will then be floated into place and suspended from the two ends of the cantilever arms. Thus, it is expected that all the main members of the bridge will be erected this year, and the connection from shore to shore made, though it will take another year to finish riveting and painting and to clean up the work. The expenditure on the bridge to date amounts to \$18,257,621, of which \$10,473,346 has been on the new bridge. The total cost of completing the bridge, taking the old bridge and the new bridge together, is estimated at \$27,000,000.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1901, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed the paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates of orders, immediately following the numbers, are those on which they were drawn.

General order 162, Mar. 30.—Approving conditions on telegraph forms used by telegraph companies on which messages to be transmitted are to be written.

General order 163, Mar. 31.—Ordering that terms of judgment, re telegraph companies' tariffs of tolls, Mar. 28, delivered by Commissioner McLean and concurred in by the other Commissioners, which is made part of this order and the tariff changes therein directed to be made, be complied with and become effective not later than July 1.

24814. Mar. 16. Authorizing C.P.R. to build road diversion at mileage 27.5 from Golden, B.C.

24815. Mar. 17. Approving G.T.R. detail plans showing substructure of Bathurst St. bridge, Toronto.

24816. Mar. 17. Authorizing Canadian Northern Ontario Ry. to build across certain highways in York Tp., mileage 0 to 14.9, northerly from new Union Station site, Toronto.

24817. Mar. 18. Amending order 24651, Jan. 13, re protection of C.P.R. crossing near Binscarth, Man.

24818. Mar. 20. Relieving G.T.R. from providing further protection at Wilson's public crossing, Iroquois, Ont.

24819. Mar. 20. Authorizing Canadian Northern Ry. to build across and divert road in s.w. ¼ Sec. 3-28-10, w. 3 m., Sask.

24820. Mar. 20. Approving Canadian Northern Ontario Ry. location of temporary main line passenger station in Parry Sound.

24821. Mar. 20. Authorizing Canadian Northern Ry. to build and divert east and west road allowance between n.w. ¼ Sec. 33-39 and s.w. ¼ Sec. 4-40-9, w. 3 m., Sask.

24822. Mar. 18. Authorizing Ancaster Tp., Ont., to build highway crossing over Toronto, Hamilton & Buffalo Ry on Leland St. West, Hamilton.

24823. Mar. 20. Approving agreement between Bell Telephone Co. and Addison Rural Independent Telephone Co., March 1.

24824. Mar. 21. Authorizing Grand Trunk Pacific Ry. to operate branch line required under order 24080, Aug. 13, 1915, to connect with Board of Grain Commissioners' elevator at Moose Jaw, Sask.

24825. Mar. 10. Authorizing G.T.R. to operate over tracks to be built by C.P.R. on Lots 22 and 23, Con. 1, Chatham, Ont., for Dominion Sugar Co., crossing to be protected by interlocking plant to be provided and operated by C.P.R., at cost of G.T.R.

24826. Mar. 22. Authorizing C.P.R. to build across First Ave., Shaanavon, Sask.

24827. Mar. 23. Ordering Canadian Northern Ry. to keep station waiting room at Tiny, Sask., heated, clean and lighted for accommodation of passengers on arrival and departure of trains, and to take care of freight and express matter.

24828. Mar. 23. Amending order 24698, Jan. 31, re C.P.R. spur for Ford Motor Co. at Winnipeg.

24829. Mar. 22. Authorizing C.P.R. to build diversion, in lieu of road allowance between Secs. 22 and 27-13-11, w. 4 m., Alta.

24830. Mar. 24. Dismissing applications of Ivey & Co., Port Dover, Ont., for order directing G.T.R. to build siding at Port Dover, without prejudice to an application under Sec. 226 of Railway Act.

24831. Mar. 23. Approving G.T.R. plans showing temporary repairs to Bonaventure station, Montreal.

24832. Mar. 27. Authorizing Grand Trunk Pacific Branch Lines Co. to build highway over Battleford Branch in n.e. ¼ Sec. 4-43-16, w. 3 m., in rural municipality 438, West Saskatchewan District, Sask.

24833. Mar. 27. Approving New York Central Rd. bylaw passed March 15, and rescinding order 23265, Feb. 9, 1915.

24834. Mar. 25. Authorizing Canadian Northern Ry. to cross and divert special road in s.e. ¼ Sec. 33-27-10, w. 3 m., Sask.

24835. Mar. 27. Ordering Canadian Northern Ry. to appoint station agent by May 1, at Excel, Alta.

24836. Mar. 27. Ordering Grand Trunk Pacific Ry. to appoint station agent by May 1 at Smiley, Sask.

24837. Mar. 28.—Extending, finally, to Aug. 1, the effective date of item on page 9 of Supplement 5 to Canadian Freight Classification 16, giving specifications of cheese boxes for carriage as freight.

24838. Mar. 28.—Authorizing Toronto & Hamilton Highway Commission to build temporary industrial railway along right of way and tracks of Hamilton Radial Electric Ry. in Oakville, Ont., rights so granted not to extend beyond Sept. 1.

24839. Mar. 28.—Relieving Canadian Northern

Ry. from providing further protection at highway just east of Kamsack yards, Sask.

24840. Mar. 29.—Postponing, until further order, effective date of increased minimum weight for fir, spruce, hemlock and common cedar lumber, when loaded in cars under 36 ft. long, from 30,000 to 35,000 lbs. per car, as appearing in C.P.R. Supplement 59 to C. R. C. no. W. 1806.

24841. Mar. 30.—Ordering Canadian Northern Ry. to fence both sides of its right of way, from mileage 387.2 to 2 miles east of Bedford, Man., running easterly to Sandilands, mileage 381.7, by May 15.

24842. Mar. 30.—Authorizing Canadian Northern Quebec Ry. to build across public road between Lots 41 and 42, R. 7, Ponsby Tp.

24843. Mar. 30.—Authorizing Canadian Northern Ontario Ry. to build spur on parts of lots 13 and 14, Con. 5, Field Tp., Ont.

24844. Mar. 30.—Authorizing Canadian Northern Quebec Ry. to build across public road in lot 36, R. 1, Arundel Tp.

24845. Apr. 1.—Approving Vancouver, Victoria & Eastern Ry. & Navigation Co. (G.N.R.) plan of location for station and facilities in Vancouver, B.C.

24846. Mar. 31.—Authorizing British Columbia Government to build highway over Grand Trunk Pacific Ry. at Newlands station.

24847. Mar. 30.—Ordering Canadian Northern Ry. to furnish tri-weekly train and mail service on its Winnipegosis Branch, from June 1 to Sept. 15, when it may reduce service to semi-weekly.

24848. Apr. 3.—Authorizing Quebec, Montreal & Southern Ry., until further order, to remove station agent at St. Robert, Que.; caretaker to be appointed for accommodation of passengers and to care for freight and express matter.

24849. Apr. 3.—Authorizing Canadian Northern Quebec Ry. to build across and divert certain highways in Amherst Tp.

24850. Apr. 1.—Relieving Grand Trunk Pacific Branch Lines Co. from erecting fences, gates and cattle guards on its Regina-Boundary Branch, on east side of station grounds at Huntoon, Sask.

24851. Apr. 3.—Authorizing G.T.R. to build siding for Canada Forge Co., Welland, Ont.

24852. Apr. 3.—Authorizing C.P.R. to build diversion in lieu of road allowance at mileage 129.91, Hardisty Subdivision, Alta.

24853. Apr. 3.—Authorizing C.P.R. to build spur for Martinon Lumber Co. at mileage 65.67, Shore Line Subdivision, N.B.

24854. Apr. 4.—Authorizing Canadian Northern Quebec Ry. to build across public road in Lot. 40, R. 7, Ponsby Tp.

24855. Apr. 4.—Authorizing C.P.R. to build across and divert highways at mileage 371.38; 375.73; 363.84; 420.65, and 421.41, on its Pheasant Hills Branch, Sask.

24856. Apr. 4.—Amending order 24029, July 28, 1915, re G.T.R. crossing at Barton St. and Ferguson Ave., Hamilton, Ont.

24857. Apr. 4.—Dismissing complaint of Hunting-Meritt Lumber Co., Vancouver, B.C., against refusal of British Columbia Electric Ry. to handle cars destined or to for furtherance via Great Northern or Northern Pacific Rys. and rate on lumber and shingles of 1c per 100 lbs. over Vancouver rates which complainants have to pay on shipments from Eburne to points in Canada and United States.

24858. Mar. 29.—Authorizing Canadian Northern Ontario Ry. to build across highways, mileage 44.78 to 47.81, Scott Tp.

24859. Apr. 4.—Approving London Railway Commission's bylaw authorizing J. E. Richards, Manager and Treasurer, London & Port Stanley Ry., to prepare and issue tariffs of tolls.

24860. Apr. 1.—Ordering G.T.R. to open railway crossing as a continuance of Pitt St., Glen Robertson, Ont.

24861. Apr. 5.—Ordering G.T.R. forthwith to desist from charging any toll other than that prescribed under order 4988, on traffic from and to interchange with Canadian Northern Ry., as authorized by order 24416, Nov. 5, 1915, near Ottawa, Ont.

24862. Apr. 4.—Approving agreement between Bell Telephone Co. and La Cie. de Telephone St. Ours, March 27.

24863. Apr. 4.—Relieving C.P.R. from providing further protection at Hawkesbury Road, near Vankleek Hill Station, Ont.

24864. Apr. 4.—Authorizing C.P.R. to use bridge at Ninth Ave., Broadview, Sask.

24865. Apr. 4.—Approving agreement between Bell Telephone Co. and Malahide & Bayham Telephone Association, March 27.

24866. Apr. 5.—Approving plans of signalling for Montreal & Southern Counties Ry. across Victoria Jubilee Bridge, Montreal.

24867. Apr. 4.—Ordering Canadian Northern Ry. to put in cattle pass when it fills trestle at mileage 757.7, on e. ½, sec. 27, tsp. 52, range 15 w., 4th meridian.

24868. Apr. 5.—Dismissing complaints of T. H. Taylor and Canada Flour Mills Co., Chatham, Ont., against interswitching charge of 2c per 100 lbs. on grain, ex-lake, milled in transit at Chatham.

24869. Apr. 5.—Ordering Vancouver, Victoria

& Eastern Ry. and Navigation Co. (G.N.R.) to protect tracks between Ocean Park and White Rock, B.C., from May 15 to Nov. 15 each year, one watchman to patrol track between mileposts 123 and 127 from 7 p.m. to 7 a.m., and from Nov. 15 to May 15 each year, two watchmen to patrol track from 7 p.m. to 7 a.m., one from milepost 123 to 125, and other from 125 to 127; speed of all trains and locomotives not to exceed 10 miles an hour between mileposts 123 and 127 throughout year; and rescinding orders 17959, Nov. 5, 1912, and 23885, June 21, 1915.

24870. Apr. 6.—Ordering G.T.R., within 60 days, to install bell at Talbot Road, just east of Courtland Station, Ont., 20 per cent. of cost to be paid out of railway grade crossing fund.

24871. Apr. 6.—Authorizing Grand Trunk Pacific Ry. to build highway over its main line and siding between lots 361 and 369, R. 5, Coast District, B.C.

24872. Apr. 6.—Amending order 24825, March 10, re G.T.R. operation over Dominion Sugar Co.'s spur at Chatham, Ont.

24873. Apr. 7.—Ordering C.P.R. to inaugurate on or about June 1, daily, except Sunday, service between Empress and Swift Current, Sask.

24874. Apr. 6.—Relieving C.P.R. from providing further protection at Third St., London Tp., Ont.

24875. Apr. 8.—Ordering Grand Trunk Pacific Ry. to appoint caretaker at Cando Station, Sask.

24876. Apr. 7.—Authorizing City of Windsor, Ont., to build overhead crossing at Wyandotte St.

24877. Apr. 8.—Authorizing G.T.R., Toronto, Hamilton & Buffalo Ry. and Hamilton St. Ry. to operate over crossing at Burlington St., Hamilton, Ont., and authorizing G.T.R. and T.H. & B.R. to operate trains over same without stopping; speed not to exceed 10 miles an hour.

24878. Apr. 10.—Amending order 24856, Apr. 4, re G.T.R. crossing at Barton St. and Ferguson Ave., Hamilton, Ont.

24879. Apr. 10.—Extending for one year from date, time within which City of Regina, Sask., shall build bridge across C.P.R. on Hamilton St.

24880. Apr. 8.—Ordering Canadian Northern Ry. to appoint caretaker at Fairmount Station, Sask.

24881. Apr. 10.—Ordering Great Northern Ry. to erect fences along right of way on property of J. Rinn, Elm Creek, Man., on west side of railway for 1,287 ft., on east side for 2,850 ft., to install gates through station grounds at Magnus, Man., and cattle guards at crossing of Government road allowance, by May 31.

24882. Apr. 8.—Ordering G.T.R. to place day watchman at highway crossing east of Coteau, Que., mileage 37.58, between 7 a.m. and 7 p.m.; wages to be paid 75 per cent. by G.T.R. and balance by Soulanges County, Que.

24883. Apr. 8.—Relieving Grand Trunk Pacific Branch Lines Co. from erecting fences, gates and cattle guards on its Tofield-Calgary Branch, mileage 0 to 201, Alta.

24884. Apr. 11.—Authorizing Essex Terminal Ry. to build spur across Mercer St. and Hanna Ave., Windsor, Ont.

24885. Apr. 11.—Approving plan and specifications of Turvey drain, to be constructed under G.T.R. in Morris Tp. about 32.62 miles west of Palmerston, Ont.

24886. Apr. 11.—Dismissing application of Brotherhood of Locomotive Firemen and Engineers for order directing railway companies to erect railway crossing sign posts (mile whistle boards) at railway crossings, at grade.

24887. Apr. 11.—Approving Toronto, Hamilton & Buffalo Ry. form of release and power of attorney 147, to be signed by persons who desire, for special reasons, to travel in cars which are not intended to carry passengers.

24888. Apr. 11.—Authorizing Canadian Northern Ontario Ry. to connect its Montreal-Ottawa line with G.T.R. near Ottawa.

24889. Apr. 11.—Relieving C.P.R. from providing further protection at highway at mileage 8.4 from Place Viger, 1½ miles east of Jacques-Cartier Jct., St. Laurent, known as Cremazie Road, Montreal.

24890. Apr. 11.—Relieving C.P.R. from providing further protection at highway first west of Herbert station, Sask.

24891. Apr. 11.—Authorizing Canadian Northern Ry. to build connecting track with G.T.R. across public road in Lot. 11, Gloucester Tp., Ont.; protection at crossing reserved for further consideration.

24892. Apr. 11.—Dismissing C.P.R. application for order amending general order 65, Nov. 9, 1910, as amended by general order 68, Feb. 6, 1911, re clearances.

T.H. & B.R. Wages.—Arbitration proceedings in connection with the demand for increased wages by mechanics employed on the Toronto, Hamilton & Buffalo Ry., were opened at Hamilton, Ont., April 10, before the arbitrators, Judge Snider, G. S. Kerr, K.C., and Jas. Simpson.

Electric Railway Department

Recent Developments in Electric Railway Car Equipment.

By W. G. Gordon, Transportation Engineer, Canadian General Electric Co., Ltd.

(Continued from last issue.)

Control.—Modern methods of control, including both hand control and multiple unit control, also show great advances of recent years. The number of operations that a car controller must perform daily is remarkable, and the work that is accomplished with the platform controller is still more remarkable. In city streets the controller is kept in almost constant movement, making and breaking large currents, and doing its required work indefinitely, requiring very little attention, and receiving considerable abuse. A big advance in the design of the platform type of controller was made in applying individual magnetic blowouts to each finger, and also in rearranging the internal connections so as to secure the minimum potential between adjacent contacts. With the individual blowouts, the burning of the arc chutes has been practically eliminated; and the platform controller as it stands today is absolutely safe, reliable and dependable. Where field control is desired with this type of controller it is secured by the use of extra fingers in the controller. This form of control is built to handle a total motor equipment of 360 h.p. at 600 volts; although, for various reasons, with equipments of this capacity and even considerably smaller, it may be advisable to use multiple unit control either for single car or train operation. The hand operated platform type of controller has been built and operated up to 1,500 volts, successful operation being secured by increased creepage, insulation, and current rupturing capacity. This is the highest voltage at which this type of controller has so far been called on to operate.

Multiple unit control generally replaces hand control with platform type of controller, for a total horsepower of equipment between 200 and 300 h.p., depending largely on local conditions of car layout, space available for location of controller, and desirability of securing train operation with two or more cars. Very decided advances have been made in simplifying the apparatus comprising a multiple unit equipment of recent years, especially from the point of view of mounting the apparatus under the car body and wiring up between the contactors (whether electrically or pneumatically operated), reverser, rheostats and motors. Whether the multiple unit control should be non automatic or automatic depends, for any given service, on the conditions and requirements. Automatic control is recommended where several motor cars are operated in a train and where it is desirable to prevent high current peaks. It secures a minimum slipping of the wheels with high acceleration. An interesting application of automatic control is used by one of the large railway companies in the United States. The passenger load is a higher percentage than usual of the total loaded weight of car, so the setting of the current relay is varied automatically corresponding with the varying compression of the truck springs.

For interurban work there promises to be a big development throughout Canada in the use of high voltage direct current, with multiple unit operation. 600 volts,

1,500 volts, 2,400 volts and 3,000 volts form a natural progression; and in laying out new work it is a simple matter, and involves a very small relative increase in cost, to make provision in the line construction and power supply for going up to the next highest voltage step when future conditions will warrant the change. With regard to supply for auxiliary circuits, when operating on 1,500 volts or higher, for control, lights, heaters (if electric heaters are used) and pump motor, various combinations are used, depending largely on local conditions. The most common method of obtaining low voltage current for the control circuit is by the use of either a motor generator set or a dynamotor. The dynamotor is smaller, lighter, and cheaper than the motor generator, and is quite generally used up to and including 1,500 volts; its operation having proved entirely satisfactory and its maintenance cost almost negligible. In this connection I might mention with regard to the motor equipments which I referred to as showing such small brush wear after years of service, that the dynamotors in operation with those equipments were also running with the original brushes.

The most satisfactory arrangement for the air compressor is to provide it with a high voltage motor. It is found that a 1,500 volt motor of this size can be built with excellent characteristics. Another arrangement for use on 2,400 volts consists in having two 1,200 volt motors, one on each side of the compressor; and for 3,000 volt operation the use of two 1,500 volt motors.

With regard to electric car heaters, the design of 1,500 volt heaters was not a serious matter, the chief precaution being to provide against foreign objects coming in contact with the live parts, and at the same time not to restrict free air circulation. 2,400 and 3,000 volt individual heaters are in successful operation for locomotive cabs; but for cars operating at these voltages, the plan adopted is to mount the heater under the car. A fan blows air over the heated coils and the hot air is distributed evenly through ducts along both sides of the car.

With regard to car lighting, in many cases the amount of current required for this purpose is small enough to make it desirable to supply the lights from the dynamotor. It was found unsafe to connect lights across 1,500 volts using the standard 600 volt sockets, as the leading in wires are close enough together to hold the arc in case of a filament breaking. A new socket has been produced, similar to that used for series street lighting, and twelve 125 volt lamps can be used in series on 1,500 volts. The receptacle for the socket covers the lamp base and all the live parts and is thoroughly grounded, thus affording very thorough protection.

The luminous arc type of headlight has been very successful and is very economical in maintenance. This type of headlight, with parabolic metal reflector, throws a wide beam of light; and, with a semaphore lens, throws a concentrated beam for a great distance ahead. This latter type is largely used on high speed roads. Dimming can be arranged for,

either by reversing the polarity of the arc or, with incandescent lamps. A smaller headlight of the same type throwing a concentrated beam for 600 to 800 ft. is excellently adapted for city and suburban work. Some roads consider the results obtained with high efficiency metal filament lamps with concentrated filament used with parabolic reflector warrant for providing a special low voltage supply of from 6 to 30 volts for the headlights.

In the case of combined 600 and 1,500 volt operation, which is a condition sometimes met with, a protective device is necessary to prevent the higher voltage from ever being maintained on the low voltage circuits. A protective relay is used for this purpose which is connected so that the low voltage circuits are instantly opened in case the higher voltage is impressed on them. These circuits cannot be restored till the proper steps have been taken and the higher voltage removed from the relay. When going from 1,500 volt to 600 volt operation, provision must be made to supply the lower voltage to the auxiliary circuits, and also to disconnect the dynamotor. This is done by means of a two position selector relay. In the down or normal position the 1,500 volt trolley is connected to the dynamotor, and the low voltage tap on the dynamotor is connected to the auxiliary circuits. When going from 1,200 to 600 volts the motorman closes a switch energizing the relay coil, thus disconnecting the dynamotor from the trolley and transferring the auxiliary circuits from the low voltage tap on the dynamotor directly to the 600 volt trolley. The protective relay prevents damage in case the motorman throws the switch energizing this relay while still on 1,500 volt trolley or neglects to throw the switch when going from 600 volt to 1,500 volt trolley.

Generally, in city running, on 600 volts with 1,500 volt equipment, it is satisfactory to operate at less than half speed; however, in some cases where there is a lot of suburban running on 600 volts, it is desirable to run at a higher speed. To do this it is necessary to parallel the motors, which are run two in series on 1,500 volts, and also to change the rheostat connections to provide sufficient current for the motors during accelerating on the lower voltage. Both of these operations are performed on a commutating switch. This switch has two positions, one for 600 volts and another for 1,500 volts, in which the motors and various rheostat sections are connected in parallel and series respectively. The proper connections of the auxiliary circuits to the low voltage tap of the dynamotor when running on 1,500 volts, or to trolley when on 600 volts, are also made on the commutating switch. The commutating cylinder may be thrown by a handle connected directly to the cylinder, or from the cab by means of an air valve and pneumatic cylinders connected to the switch, when it is mounted under the car body.

Several years experience has shown that the operating expenses of high voltage control apparatus are exceptionally low, in many cases less than with 600 volt

operation, this being largely due to the smaller currents handled. In connection with control, I may refer to the advance made from a maintenance point in the present type of rheostat, where a broken grid can be easily and quickly replaced without having to take down and dismantle the rheostat.

Modern car wiring has also been put on a sound basis to insure long life and protection to the wiring with practically no maintenance cost. If special protection by lightning arresters for car service is desired in localities with severe lightning conditions, the direct current aluminum type of arrester should be used. This type will solve any problem in direct current electric railway protection. They, however, require proper inspection. Their maintenance, therefore, is considerably higher than the magnetic blow-out type of arrester. The question of the use of the aluminum type for car work depends then on the amount of protection desired; and whether the absolute assurance of this protection warrants the additional maintenance charges which their use entails.

The best types of arresters, however, are placed at a very great disadvantage if the car wiring is so laid out that electro magnetic induction from lightning can take place. To avoid this, do not place any wire that carries lightning current near and parallel to, for any considerable length, any of the wiring where damage can be done by an induced charge. A second point to note is that the wiring may be such that electrostatic induction will shunt the choke coil and render it useless. To avoid this, never bring wires connected to the opposite terminals of a lightning choke coil within one foot of each other. By observing these instructions, electrostatic induction in car wiring will be avoided and the arresters given a proper show to arrest.

Current Collectors.—The use of a wheel collector is almost universal throughout Canada, and is an important maintenance item. The trolley wheels most largely in use today range from 2½ to 5 ins. diameter at the tread, with overall diameters of from 4 to 7 ins. The larger size wheels are used for the higher speeds and the smaller for city service, though the tendency is towards the use of the larger wheel for all classes of service. The great majority of wheels are of alloy, hardness and conductivity being obtained by a mixture of over 90% copper with a small amount of tin and zinc. The claim of long life has been made for the use of the iron trolley wheel. This is true, but they cause excessive wear on the wire, as the contact surfaces become pitted and covered with fine points from the arcing. These points are chilled by the air to a cutting hardness, conditions much exaggerated during rain and sleet storms. The principal trouble with a wheel collector is to get satisfactory lubrication and to carry the current from the wheel to the harp. The ordinary method of lubrication is the use of graphite paste pressed into spiral grooves in a brass bushing, although grease and oil are also used in a number of ways. The general tendency seems to be toward the use of a pin from ¾ to 1 in. in diameter as against the smaller sizes. With a wheel collector, the limitation in current carrying capacity is due to the difficulty in collecting current from the moving faces of the trolley wheel. Side springs and washers are generally used for this purpose; but in addition to the difficulty of getting sufficient contact area, friction is a serious matter, and in order to prevent

slipping between the wheel and wire the spring pressure must be kept very low. The use of ball and roller bearings to give greater sensitiveness to the trolley base has been a decided advance, and the use of a number of tension springs instead of one for holding the pole up, is also of benefit in this regard. The best pressure to use against the wire depends on local conditions. For service not over 30 m. p.h. with accelerating current of from 200 to 300 amperes, 20 to 30 lbs. is used. For heavier service the pressure may be as high as 40 lbs. for the best results.

A large amount of work has been expended in experimenting on pantographs, with both rollers and pans as the collecting devices. The first cost of a pantograph is considerably higher than the standard form of trolley base with pole, harp and wheel, but it possesses a number of important advantages over the standard trolley. It requires no attention either during running over special work or in reversing, and can be raised and lowered by air operation, controlled from a grounded valve, by the motorman. All these features are of value in the operation of two or more motor cars together, the latter feature especially in high voltage operation. The London & Port Stanley Ry. is operating very successfully with slider type pantographs on locomotives and motor cars.

The catenary type of line construction presents no difficulties over the usual overhead construction; and, on account of the greater pole spacing possible with its use, can meet the latter on a cost comparison on almost equal terms, while having very distinct advantages even with wheel operation for high speed service. As the catenary overhead construction suitable for wheel operation does not differ materially from that required for pantograph operation, in construction suitable for the former, providing certain standard line fixtures suitable for pantograph operation are included, a change can readily and economically be made at any later date to the latter.

Windsor, Essex and Lake Shore Rapid Ry. Appointments.

A. Eastman, Vice President and General Manager, has issued a circular making the following appointments, consequent on the accidental death of W. W. Chisholm, Electrical Engineer. The appointments follow the rule adopted some time ago by the company, of advancing officers and employees. A. BALTZER, heretofore Master Mechanic, has been appointed Electrical Engineer, in charge of power house and rolling stock; G. R. McKENZIE, heretofore second engineer, has been appointed first engineer, power house; W. L. McLARTY, heretofore third engineer, has been appointed second engineer, power house; W. BOWLES has been appointed third engineer, power house; E. BUTLER has been appointed Shop Foreman, Kingsville shops; C. PETERSON, heretofore line foreman, has been appointed Superintendent of Line Department, reporting to Superintendent O. P. Cooper.

Following are the commissioners and officials responsible for the operation of the Port Arthur Civic Ry., Port Arthur, Ont.: Commissioners, W. P. Cooke, Chairman; G. H. Rapsey, I. L. Matthews, A. E. Wideman, and the Mayor, D. J. Cowan, ex officio; acting Secretary, G. H. Rapsey; General Manager (Operation), M. M. Inglis; Master Mechanic, F. Philp; Roadmaster, James Dillon.

Toronto Suburban Railway Office Building.

The Toronto Suburban Ry. is about to erect an office building at 938 Keele St., Toronto, on the west side of the street a few doors north of Dundas Street. The front of the building will make an angle with the sides, giving a length on one side of 109¼ ft. over all and on the other side 100 ft. The width will be 28 ft. There will be basement, ground floor, and one upstairs floor. The basement will contain boiler and coal rooms aggregating 30 ft. and a fireproof vault 4½ x 7 ft. inside dimensions. The rest of the basement will be used for stores. The ground floor will contain a waiting room 56 x 25½ ft. inside dimensions, out of which space a ticket office 16 x 16 ft. will be taken. The back of the building will be an express room 35 x 25½ ft. Between the waiting and express rooms will be the stairs leading to the upper floor, a vault 7 x 4½ ft. and women's lavatory. The upstairs will have offices over the waiting room, and conductors' and motormen's room over the express room, the sizes corresponding to the lower rooms in each case. The office space will be divided by light frame and glass partitions into offices for the officials, with a general office and space for the public immediately at the entrance from the stairs. There will be employees' laboratories on this floor.

The foundation walls will be of concrete 18 in. thick and the main building walls will be brick 13½ in. thick. About the centre of the building there will be a cross wall of concrete in the basement and brick above carried to the roof. The basement floor will be 2 in. of cinders and 4 in. of concrete, finished with ½ in. dressing of rich mortar. Upper floors will be of ¾ in. birch, dressed, matched and scraped. Lavatory floors will be of composition. The building will have a store front of plate glass windows and double door, the whole having a span of about 24 ft. The wall above this span will be carried on two 15 in. I beams which will rest upon columns composed of 5 in. I beams with standard cap and base. The roof will be of ¾ t. & g. lumber, covered with tar, felt and gravel on asbestos. The waiting rooms and offices will have lath and plaster walls and will be finished in hardwood throughout. Hot water heating will be used. The building was designed by Geo. C. Briggs, Architect, under the direction of H. T. Hazen, M. Can.Soc.C.E., Chief Engineer.

The Sherbrooke Street Railway may be taken over by the municipal authorities if negotiations now pending result successfully. An offer is said to have been made by the Sherbrooke Railway & Power Co. to sell the system to the City of Sherbrooke, Que., for \$250,000. As an alternative proposition the company offers to lease the road to the city for 25 years at a semi-annual rental of \$9,000. At the end of this period the system would become the city's property.

Automobiles and Electric Car Traffic.—The Ontario Legislature has passed an amendment to the Ontario Motor Act, which prevents automobiles from creeping up to the rear of standing electric cars and thus blocking the exit for passengers. It is provided that motorists must not approach nearer than 6 ft. to any standing car, while passengers are being discharged or taken on. This applies to suburban as well as city cars, and all vehicular traffic.

Hydro Electric Railway Projects in Ontario.

In the Hydro Electric Power Commission of Ontario's report for the year ended Oct. 31, 1915, the various proposals received by the Commission for the construction of radial electric railways under the Hydro Electric Railway Act of 1914, are dealt with. During the year requests for reports and estimates on proposed lines were received, and Canadian Railway and Marine World has already covered these in detail in previous issues. From the passing of the act, applications have been received from 158 townships, 47 villages, 46 towns, 15 cities, 8 police villages, and 7 miscellaneous committees, boards of trade, etc. Two engineering parties have been maintained in the field constantly, making preliminary surveys and gathering traffic statistics for the preparation of cost of construction and equipment, probable revenue, etc. Preliminary surveys have been made, and estimates submitted for the construction of approximately 2,000 miles of line, a considerable portion of which is in the nature of alternative routes. The preparation of standard specifications for roadbed, commenced in 1913, was continued and this data is now available for use in the construction of any of the lines with which it is decided to proceed, so that tenders may be called for with as little delay as possible. In reaching the decision of a standard roadbed construction, the standards of prominent roads in Canada and the United States, and the recommendations of the various railway societies, were carefully studied. Following is the list of the various surveys, with mileage, made by the Commission, to Oct. 31, 1915:—

	Miles.
Toronto northeasterly	295.00
Kingston-Cornwall	115.00
Barrie-C.P.R.	8.20
Huron County	222.20
Guelph-Georgian Bay east line.....	226.62
London-Lambton County	126.78
London-Stratford	52.27
Guelph-Hespeler	10.00
Berlin-Woodstock	31.00
Guelph-Hamilton	35.00
London-Port Stanley	24.05
St. Marys-Exeter	19.84
St. Thomas-Aylmer	11.30
London-Aylmer	18.50
Hamilton-Galt	35.00
Lyons-Tillsonburg	17.00
Guelph-Orangeville	33.00
Aylmer-Port Burwell	15.00
Drumbo-Linwood	21.20
Tillsonburg-Woodstock	23.00
Hamilton-St. Catharines	32.10
Hamilton-Welland	10.00
St. Catharines-Queenston	8.10
Dunnville-Beamsville	24.00
Welland-Port Colborne	7.10
Port Colborne-Bridgburg	20.00
Port Credit-Hamilton	22.50
Port Colborne-Dunnville	31.74
Listowel-Fullarton	2.00
Dresden-Strathroy	2.00
Arkona-Grand Bend	43.50
Wingham-Chesley	32.64
Flesherton-Collingwood	32.64
Guelph-Port Credit	19.40
Toronto-Port Credit	4.00
Guelph-Berlin	31.50
Berlin-Stratford	66.50
St. Catharines-Pelham Tp.	11.00
Welland-St. Catharines	10.00
Nee market-Barrie	37.00
Barrie-Midhurst	2.00
Chelsea-Green Spur, London.....	2.00
Collingwood-Midhurst	51.80
Ottawa-Morrisburg	52.50
Penetanguishene-Midhurst	32.00
Dunnville-Simcoe	7.40
Baysville District	6.00
Hamilton-Port Dover	6.00
Total	2,164.14

In the Toronto northeastern district, 11 municipalities have sent signed copies of an agreement with the Commission to provide for the construction and operation of approximately 80 miles of line. On the request of the municipalities inter-

ested in the Ontario West Shore Ry., the Commission has prepared estimates of the cost of completing the construction of the line and of operating it by electric or gasoline power.

A report has also been prepared and submitted to the municipalities in the Aylmer district, for the construction and operation of a line from Westminster Jct., on the London & Port Stanley Ry., through Belmont to Aylmer, with connection to Springfield, Brownsville and Tillsonburg.

The year's work also covered the completion of the work undertaken for the London Railway Commission in the electrification of the London & Port Stanley Ry., which was opened for traffic, July 1, 1915.

Before specifications and plans could be prepared for rolling stock, equipment and sub stations, it was necessary to select a system of electrification. During the past ten years there has been considerable discussion between the most prominent engineers in Canada and the United States on this subject and opinions have been divided between the 1,500 volt direct current system and the high tension single phase alternating current system. However, during the past five years there has been a distinct movement in favor of the first mentioned system for purely interurban railways, the chief reason being that the equipment is lighter, cheaper and more standard, as well as being cheaper to maintain and capable of being operated over existing 600 volt city lines. The chief advantage of the single phase system is that the sub stations may be placed at greater intervals and the overhead system can be designed much cheaper. The Commission decided that the proposed Ontario system should be constructed on the 1,500 and 3,000 volt direct current system.

The centre entrance type of car has been in use on some of the prominent lines in the United States in recent years, chiefly for the reason that it gives greater seating capacity for the same length of car, and is also a more pleasant car to ride in, due to a better separation of the smoking, baggage and main passenger compartments. After consultation with the more prominent car manufacturing companies, it was decided that the centre entrance type of car was impracticable for the proposed Ontario lines, chiefly from the standpoint of safety. A properly designed steel car, provided with a vestibule, has been demonstrated as being the safest type of car to ride in, inasmuch as the vestibule can be designed to collapse when in collision so that the main framing of the car itself will be able to withstand the strain in a satisfactory manner. Specifications have therefore been prepared for a modern 60 ft., three compartment steel car.

Statement in the Legislature.

The Attorney General of Ontario stated in the Legislature, April 5, that no municipal corporation had been authorized by the Lieutenant Governor in Council to enter into agreements with the Hydro Electric Power Commission of Ontario for the construction, equipment and operation of electric railways to be operated by electric power or energy supplied by the Commission under the provisions of the Hydro Electric Railway Act of 1914, sec. 4, other than those mentioned in the Hydro Electric Railway Act, 1915. No agreement had been entered into for the purchase of any existing electric or street

railway or any part of any such railway, to form part of the line to be constructed and operated by the commission. Secs. 1, 2 and 3 of the act of 1915 became operative on the day of assent, April 8, 1915, but sections 4, 5 and 6 will not become operative until they are proclaimed by the Lieutenant Governor in Council.

The first three sections of the act of 1915 deal with what agreements for the building on lines may contain and the power of the municipalities to pass by-laws, to levy rates and to issue debentures, and gave power to purchase existing lines. The other sections of the act, which are not yet in operation, provide as follows: Sec. 4 confirms the contract entered into between the commission and the municipal corporations of Scarborough, Markham, Pickering, Whitby Beach, Whitby, Markham Town, Stouffville and Port Perry, subject to certain amendments set out in the sections. Sec. 5 provides for the execution of separate copies of the contract by each municipality; and Sec. 6 confirms the several by-laws passed approving of the agreement.

Edmonton Municipal Railway Operating Results.

The audited report for the year ended Dec. 31, 1915, presented to the Edmonton, Alta., City Commissioners, Mar. 15, showed total receipts of \$520,322.38, with expenditure as follows: Transportation expenses, \$294,534.91; maintenance, \$11,374.53; equipment, \$33,996.53; general, \$30,362.20; interest and redemption charges, \$259,836; depreciation, \$25,551.05; altogether showing a deficit of \$155,758.71. At Dec. 31, 1914, the total deficiency was \$630,955.19, and this has been increased during the year to \$644,431.52. From this amount has to be taken \$198,585.20, the readjustment of the depreciation reserve as recommended by the investigation committee and approved by the council. The total capital expenditure up to Dec. 31, 1915, was \$3,089,612.00.

The total number of passengers carried in 1915 was 10,658,219, against 14,081,564 in 1914. The average number carried per day in 1915 was 25,200, against 38,579. Passengers paid an average fare of 4.9, against 4.6. The difference in the fare was due to the reduction in price from 6 to 5 for 25c. Car miles run were 2,014,262 against 2,093,373.

The traffic manager has prepared a chart showing the number of passengers carried each month. The traffic dropped considerably until September, when a rerouting of the cars was instituted and the soldiers returned to the city. In December, 48,996 more passengers were carried than in Dec. 1914, and the expenses were reduced from 25.8c per car mile to 19.8c. The running expenses for 1915 were 12.5c per car mile, exclusive of power charges, against 16.6 per car mile in 1914.

Deficit for Jan. 1916, \$9,587.34; deficit for Feb. 1916, \$5,743.45.

Soldiers Not to Obstruct Street Railway Traffic. Brigadier General Lorne has issued the following order in Toronto: "It has been brought to attention that troops on the march, and small squads and bands for recruiting purposes, are interfering with street car traffic in the city. Officers commanding units will be held personally responsible that proper march discipline is preserved in the streets and no interference with the street railway company is permitted."

The Moncton Tramways, Electricity & Gas Co. is adding two p.a.y.e. one man cars to its equipment.

Toronto Suburban Railway's Car Barn Etc. at Lambton.

The Toronto Suburban Ry., in anticipation of the completion of its extension to Guelph, Ont., has built a car barn on the property between Dundas St. and the C.P.R. Toronto-Windsor line, at the top of the hill east of the Humber River and at the junction of the new Lambton-Guelph line with the old West Toronto-Lambton line. The buildings are as follows:

Inspection shop.....	63 ft. 3 in. x 151 ft. 0 in.
Repair shop.....	61 ft. 1 in. x 83 ft. 7½ in.
Machine shop.....	40 ft. 10 in. x 66 ft. 7½ in.
Paint shop.....	19 ft. 6 in. x 66 ft. 7½ in.
Blacksmith shop.....	28 ft. 0 in. x 30 ft. 0 in.
Boiler room.....	30 ft. 0 in. x 33 ft. 0 in.
Coal store.....	30 ft. 0 in. x 29 ft. 1 in.
Men's lavatory.....	30 ft. 1 in. x 11 ft. 0 in.



Lambton Car Barn, etc., Toronto Suburban Ry., South Elevation.

The track shown in the foreground is the main line, which joins the old line on Dundas St., immediately to the right of the view.

The administrative offices are on the first floor over the store and lavatory. The walls throughout are of good hard burned brick with massive buttresses to the outside. Toronto pressed brick is used for facing. The different shops, etc., are separated by brick walls, with substantial pilasters, and intercommunicating large sliding doors are provided between each. Excellent lighting is provided by large windows 8½ ft. wide and averaging about 13 ft. in height, and by ample roof lights to every portion. The roof is of mill construction, covered with asbestos and tarred and gravelled. One row of posts runs longitudinally down the centre of the inspection shop spaced at 17 ft. centres, and two rows similarly in the repair shop; one of these continuing through the machine shop. These rest on tapered concrete pedestals. The posts are 12 x 12 in., 22 ft. long, and have 6 x 8 in. braces with 10 x 12 in. corbel heads, the latter bolted to posts with ¾ x 24 in. drift bolts. These take the main 12 x 12 in. roof beams, the ends of which at brick walls are spiked to 3 x 8 in. wood plates bolted down to walls. Into these main beams are framed, with duplex hangers, the 6 x 8 in. transverse beams which carry the 2 x 8 in. dressed roof planking. Large skylights are framed in roof. The floors generally are of concrete, except in the inspection shop, which has a 4 in. cinder floor on sand. The administrative offices have wood floors. The average height of the shops is about 21 ft.

The repair shop has three tracks; 4½ in. x 60 lb. rails A.S.C.E. section are used, supported on 10 in. I's at 25 lb. resting on 4½ in. steam pipe columns, set on concrete bases 24 x 24 x 9 in. These columns have companion flange cap and base. The 10 in. I's are secured to the companion cap flanges by four ¾ in. bolts and the column bases are anchored to the concrete bases with two ½ in. pins 4 in. long. The

floor is of concrete, 4 in. thick; 1, 2 and 4 mixture, with 1 in. fine finish and 3 in. mesh. Six gauge expanded metal, resting on 7 in. I's at 15 lb. at 8½ centres. These 7 in. I beams rest on and are bolted with angles to the 10 in. I beams and at external walls, and anchored to foundation wall at piers with ¾ in. diameter w.i. hook bolts, 4¾ x 6 x 6 in. w.i. plate to outside. The whole of the space under the repair shop is excavated for a depth of about 4 ft. and has a 4 in. concrete floor on 4 in. of gravel, laid with fall to sub pit of ½ in. to the foot. Below the tracks, on this floor, rails 2½ ft. gauge are laid on solid concrete beds. On these

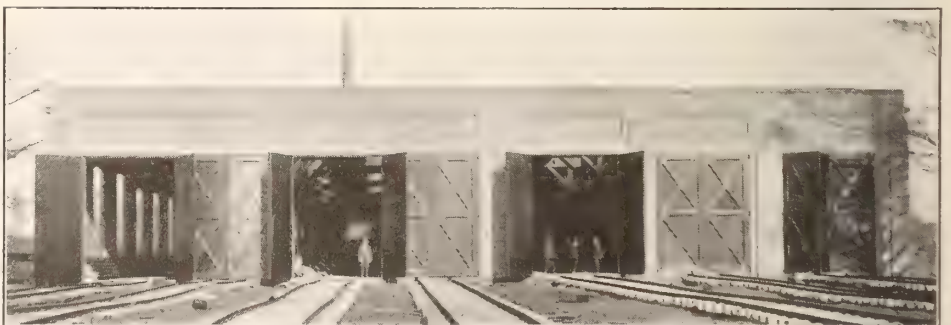
set at any desired height. Twelve standard skylights 8 x 17 ft. are framed in roof.

The machine shop is to be equipped with: 100 ton capacity wheel press; two in one lathe for axle, wheel and small work; spindle lathe; combination radial drill; air trip hammer; wheel grinder; shaper; slotting machine; babbitting furnace; soldering iron furnace; forge; air compressor; 2 pit jacks; 2 cranes; travelling crane; benches, vises, machinist's and blacksmith's tools; full set wood working tools and machines. Two skylights, 8 x 68 ft., run longitudinally in centre of each span and provide excellent lighting to every portion of the shop.

In the paint shop, in addition to the windows, a skylight, 8 x 68 ft., is placed over tracks giving sufficient light for every purpose. The blacksmith shop also contains a standard ventilated skylight 8 x 11 ft. The men's lavatory is provided with 6 water closets, wash basin and urinal troughs and 6 lockers. There is a large ventilated top light.

The boiler room contains a 75 h.p. locomotive type boiler. There is a skylight 8 x 11 ft. The coal storage is very conveniently located, and is so arranged that the coal will be brought direct in cars over the company's own tracks and shovelled through a high doorway level with the coal car, thus necessitating a minimum of handling. The coal space is well placed in relation to boiler. The chimney rests on a solid concrete foundation and the brick work, 7 ft. square, is carried 15 ft. above grade. The steel stack, 36 in. diameter, is 65 ft. above grade.

At the southeast corner of the building entrance is provided to the administrative offices on the first floor. They are placed over the store and lavatory and consist of five offices; public waiting space, separated from the larger office by counter, with office lavatory and private lavatory. The rooms are 9 ft. high and are finished with ¾ in. birch floors and the walls and partitions are plastered.



Lambton Car Barn, etc., Toronto Suburban Ry., Front or West Elevation.

with wired rolled plate glass, set on 4 in. solid wood curbs, are placed in roof.

The inspection shop contains 4 tracks, each of which will accommodate 2 cars. The rails rest on tapered concrete piers placed 4 ft. centres. The floor is hollowed out around these piers below the general floor level, thus permitting the workmen to make minor repairs. To further facilitate in the light repair work, cleaning and painting of the cars, movable iron brackets can be attached to the structural wood posts, on which plank scaffolding can be placed. The posts are bored at intervals to receive the ends of these brackets, so that the scaffolding can be

A low pressure vacuum steam heating system has been installed. By means of a pressure reducing valve sufficient live steam is admitted automatically to effectively heat the buildings. The radiation amounts to 4,500 sq. ft., with the mains and returns included as radiation, and the following temperatures are provided for: Offices, 75° Fahr.; store, 60°; blacksmith shop, 50°; paint shop, 65°; machine shop, 60°; repair shop, 50°; inspection shop, 50°. These temperatures are guaranteed at 5° below zero, at 2 lbs. pressure, and at 15° below zero at 5 lbs. pressure.

A wood tank of 10,000 gall. capacity is placed outside the southeast corner of the

building, supported on steel framework, set on tapered concrete bases. The water supply is obtained from two wells sunk nearby and is pumped to the tank by means of a small electrically operated pump.

The building cost about \$25,000, inclusive of heating and lighting, but not including water tank. It was designed and its erection carried out under the superintendence of Geo. C. Briggs, architect under the general direction of H. T. Hazen, M.Can.Soc.C.E., Chief Engineer.

St. John Railway Co's Annual Report and Meeting.

Following are extracts from the report for the calendar year 1915, presented at the annual meeting in St. John, N.B., recently: The earnings for the year, after

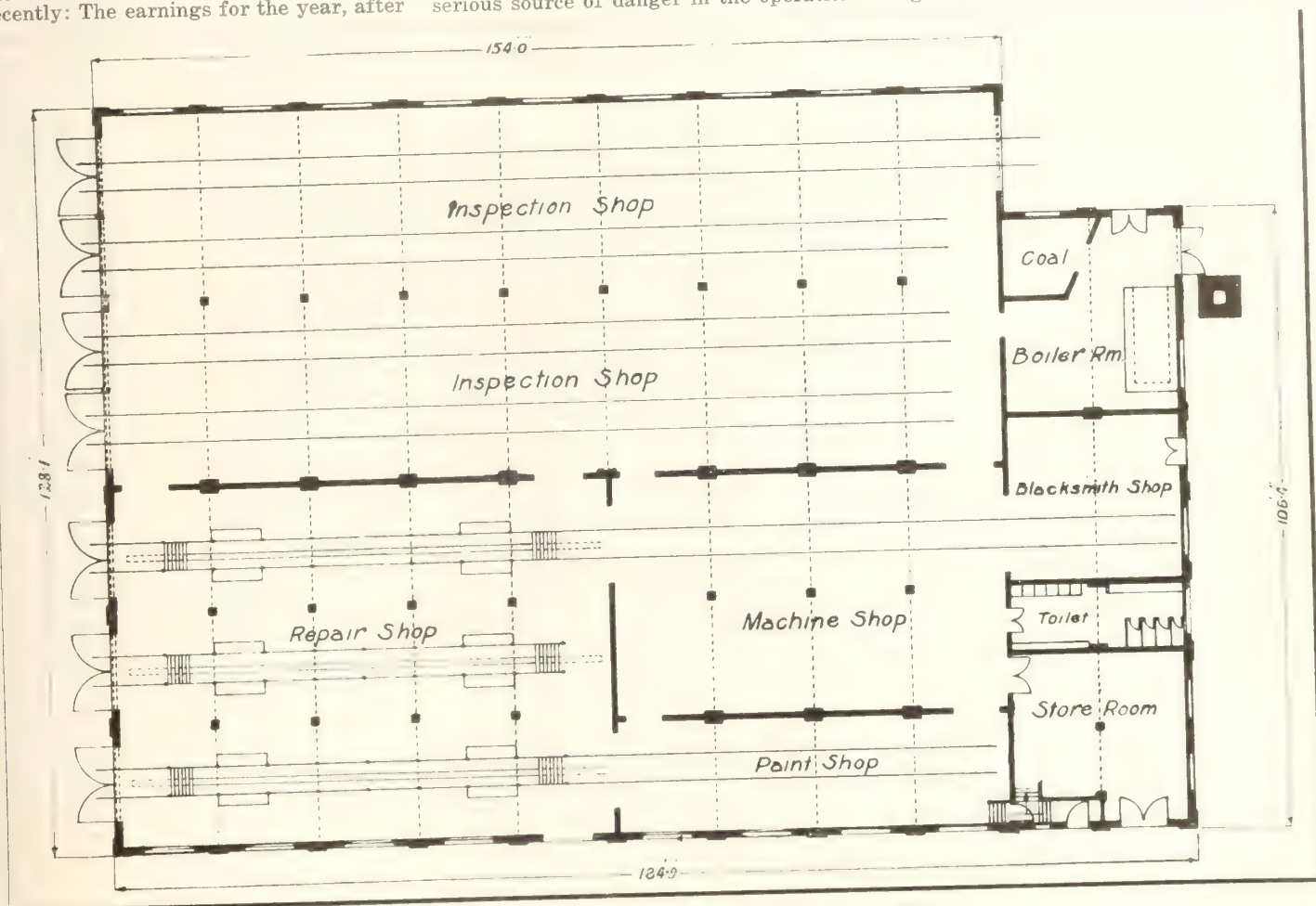
first submitted the legal points to the judgment of the court before taking the law in its own hands.

During the year we completed the Glen Falls extension to the Manor House, and commenced operating it on May 24, 1915. Crouchville extension was completed and operation commenced on Aug. 19, 1915. These extensions are operated at a heavy loss. The completion of the new bridge over the falls enabled us to connect up the east and west sides of our railway system, and a through service was inaugurated on Jan. 1 last. The cost of this work was upwards of \$50,000. A considerable sum was expended in the upkeep of the property, which is in a high state of efficiency. The curves at the foot of King, Prince William and Dock Streets were relaid, and the sharp curves eliminated. This work will remove a serious source of danger in the operation

Dominion Power and Transmission Co's Annual Report.

Following are extracts from the report for the calendar year 1915:

The directors have considerable satisfaction in laying before the shareholders the report on the business of the past year. While the statement shows no marked change over the previous year, the general course of the business must be regarded in estimating its significance. The depression and unfavorable conditions of 1914 continued during the first six months and onward through Aug., 1915, and until that month the decline in our earnings continued. The falling off was somewhat emphasized during June, July and August, by the operations of the so called jitney system. At the end of August the gross earnings had declined,



Lambton Car Barn, Toronto Suburban Ry., General Plan View.

providing for the interest on the bonds and all other charges, were \$71,066.89, out of which your directors declared and paid four quarterly dividends of 1½¢ each, amounting to \$60,000, leaving a balance of \$11,066.89, which has been transferred to profit and loss account.

The company's street railway earnings were seriously affected by the action of the City's Department of Public Works in tearing up our rails on Union and Main Streets, and filling in the track section with concrete, also removing our rails on Princess St. This stopped the circulation of our cars, made it necessary to transfer at points where our tracks had been torn up, and seriously inconvenienced the travelling public. The legal points involved were submitted to the Supreme Court of New Brunswick, and judgment was given in our favor. It would have been better if the city had

of that section of the railway. We were delayed for over eight months in carrying out this work by the action of the city authorities, which greatly increased the cost.

Electric Railway Statistical Statement.		
	1914.	1915.
Gross earnings	\$242,859 83	\$242,217 31
Operating expenses	257,282 64	250,714 34
Expenses per cent. of earnings	105.91	103.51
Deficit	14,422 81	8,497 03
Passengers carried	5,576,455	5,541,417
Car earnings per passgr.	4.35c.	4.37c.
Transfers	2,036,363	2,241,562
Total passengers carried ..	7,612,818	7,782,979
Car earnings per passenger total carried	3.19c.	3.11c.
Number of miles of track ..	21½	25

The directors for the current year are: Col. Hugh H. McLean, K.C., M.P., President; F. R. Taylor, Vice President; R. B. Emerson, J. Manchester, W. H. Thorne, J. K. L. Ross. The General Manager and Secretary is H. M. Hopper.

as compared with the same period of 1914, by \$128,437.88. During the remainder of the year the falling off was reversed, the larger part of the recovery taking place in November and December, indicating that a decided improvement may be expected in 1916. The policy of setting apart from gross earnings 20% thereof for maintenance and renewal has been continued. After having provided \$384,771.38 for bond interest, \$386,613.25 for dividends, and \$109,640.38 of unexpended maintenance and renewal reserve, there stood at the credit of profit and loss \$1,139,259.49, from which account \$500,000 has been transferred to the regular reserve account, which now stands at \$1,500,000, leaving still at the credit of profit and loss \$639,259.49. Under the business and money conditions which have been prevailing, it was decided to suspend proceeding with the steam station

construction, but it is intended to proceed to completion as soon as the weather permits satisfactory building work. Operation for the past year has been smooth and uneventful, and the directors look forward to the coming year with confidence and satisfaction. Eighty three employees have joined the military forces of the Empire, being contributed from all parts of the staff. The profit and loss accounts for 1915 and 1914 compare as follows, the cents being omitted:—

	1915.	1914.
Operating expenses	\$2,353,956	\$2,395,967
Net	1,352,001	1,390,846
Transfer to maintenance and renewal account..	1,001,955	1,005,020
Balance	109,640	101,023
Bond interest & interest	892,314	904,096
Surplus earnings	384,771	377,105
Previous balance	507,543	526,991
Dividends	1,020,405	955,861
Bad debts	386,613	461,932
Reserve	2,075	1,055
Balance	500,000	.....
	639,259	1,020,405

The City of Toronto and the Toronto Suburban Railway.

The bill which the City of Toronto was promoting, providing that all the Toronto Suburban Ry Co.'s rights and privileges to operate railways or exercise any other franchise rights within the part of ward 7 south of Dundas St. be forfeited and cancelled, was dealt with by the Ontario Legislature's Private Bill Committee, Apr. 5, and rejected. The Chairman, Hon. I. B. Lucas, Attorney General, stated that it was the feeling of the committee that the request to cancel the franchise and interfere with the vested rights of a company was absurd and outrageous. He characterized the mayor's remark that the whole hydro radial railway plans would fall to the ground unless the franchise was cancelled, as nonsense.

This was the second attempt by the city to obtain legislation cancelling the franchise within the city limits. The previous attempt was made Mar. 23, when a bill was promoted to give the city power to expropriate the portion of the railway within the city limits, declaring that the franchise or control of tracks on the highways was to be estimated as of no value whatever, and also declaring that the company's rights and privileges within the city be cancelled and forfeited. The bill included some other matters relating to the company and to the Toronto Ry. Co., but the whole was rejected.

The Toronto Suburban Ry., under its agreement with York Tp., dated Sept. 4, 1899, has the exclusive right to build and operate a single and double track railway on Davenport Road from the northern limits of the city to the east limit of the town of Toronto Junction, and in the part of Bathurst St., between Davenport Road and the northern limits of the City of Toronto. The franchise is for 30 years and expires Sept. 4, 1929, and on the expiration of the 30 years the company is entitled to a renewal for a further 20 years upon such terms as may be agreed upon between the company and the township, and so on at the end of each 20 year period. The township at the end of any of these periods, may take over the railway at a valuation by agreement or arbitration. Since this agreement was entered into, the town of Toronto Junction, and other outlying portions over which the company has rights, have been incorporated in the city of Toronto, and disputes have been of constant occurrence.

Mainly About Electric Railway People.

Robt. W. Moore, heretofore Master Mechanic, Moose Jaw Electric Ry., Moose Jaw, Sask., has been appointed Assistant Superintendent.

Hugh Logan, who has been connected with the British Columbia Electric Ry's office staff, has been granted leave of absence to enlist for overseas service.

J. E. Hutcheson, General Manager, Montreal Tramways Co., returned to Montreal early in April, after spending about a month at St. Augustine, Florida.

Bion J. Arnold, of Chicago, has been appointed on the United States Naval Consulting Board, to represent the American Society of Aeronautic Engineers.

W. H. Dinsmore, heretofore one of the traffic inspectors, British Columbia Electric Ry., has been appointed acting Traffic Superintendent, J. Hilton, Traffic Superintendent, having retired.

C. H. Batchelor, heretofore Roadmaster, St. Clair Line, Toronto Civic Ry., has

of Ontario pays the following yearly salaries, as announced in the Ontario Legislature recently: **F. A. Gaby**, Chief Engineer, \$10,000; **W. W. Pope**, Secretary, \$4,000; **W. S. Andrews**, Auditor, \$3,000.

G. W. Lang, whose portrait was published in our last issue, and who was mentioned as Claims Agent, Ottawa Electric Ry., is, as we previously announced, also acting Superintendent during the absence on military service of **F. D. Burpee**.

Duncan McDonald, who has been one of the city controllers of Montreal for the past year or two, was defeated for the mayoralty Apr. 3 by Mayor Mederic Martin. Alderman Lapointe, another candidate, lost his deposit. The votes were: Martin, 33,247; McDonald, 23,300; Lapointe, 16,566.

James Hilton, whose resignation as Traffic Superintendent, City and Suburban Lines, British Columbia Electric Ry., Vancouver, was announced in our last issue, began railway work with the Montreal St. Ry. in 1897, and in 1908 was appointed Superintendent, Third Avenue Division, Third Avenue Ry., New York, resigning in Oct. 1911 on his appointment to the B.C.E.R.

D. L. Welch, who was recently appointed General Freight and Passenger Agent, Chatham, Wallaceburg & Lake Erie Ry., Chatham, Ont., was born at Clinton, Ont., Feb. 29, 1892, and entered railway service, May 24, 1909, since when he has been to June 1911, relieving agent, Pere Marquette Rd., Buffalo Division; June 1911 to May 1913, cashier, P.M.R., Wallaceburg, Ont.; May 1913 to Feb. 20, 1916, Local Freight and Passenger Agent, Chatham, Wallaceburg & Lake Erie Ry., Chatham, Ont.

T. F. Ahearn, only son of Thos. Ahearn, President, Ottawa Electric Ry., and who is himself a director of that company, entered the Governor General's Foot Guards as a subaltern in 1906. In Oct. 1914, he entered the Canadian Army Service Corps, went to England in Mar. 1915, and on to France in Sept. 1915. He was promoted to a captaincy and early this year was recalled to militia headquarters at Ottawa to assist in munitions work. He has now been seconded from the C.A.S.C. and has been appointed A.D.C. to the Minister of Militia.

Charles Harper Batchelor, who has been appointed Traffic Manager, Toronto Civic Ry., Toronto, was born at Bradford, Eng., May 18, 1885, and entered electric railway service in Aug., 1907. He has been, from Apr. 9, 1909, to Apr. 1, 1913, conductor and motor man, Bradford City Tramways, and also motor man on the rail-less electric car system, Bradford, Eng.; Apr. 20 to June 1, 1913, motor man, Toronto Ry., Toronto; June 6 to Aug. 22, controller man, Toronto & York Radial Ry., Toronto; Aug. 22, 1913, to Mar. 21, 1916, Roadmaster, Toronto Civic Ry., Toronto.

James J. Callahan, Manager of Operation, London & Port Stanley Ry., London, Ont., resigned Apr. 8. He was appointed to that position in July 1915, on the completion of the electrification of the line. He was born at New Glasgow, Que., Feb. 25, 1875, and entered electric railway service, Apr. 27, 1897, since when he has been, to 1901, motorman, Montreal Park & Island Ry., Montreal; 1901 to 1908, Inspector and Chief Instructor, Montreal St. Ry., Montreal; 1908 to 1909, Chief



F. D. Burpee
Superintendent, Ottawa Electric Railway.

been appointed Traffic Manager, succeeding **J. Metcalf**, who has enlisted in the Canadian Expeditionary Forces.

Hiram Williams, Assistant Comptroller, British Columbia Electric Ry., has resigned and left Vancouver for England. No other appointment to the position will be made for the present at least.

J. L. Perron, K.C., of Montreal, who is the Montreal Tramways Co.'s solicitor, and who has represented Vercheres in the Quebec Legislative Assembly for some years, has been appointed to the Quebec Legislative Council.

Moses Switzer has been appointed examiner of motormen for the Toronto Civic Ry., and his appointment has been confirmed in pursuance of the provisions of the Ontario Railway Act. by the Ontario Railway and Municipal Board.

The Hydro Electric Power Commission

Inspector, New York and Queens County Ry., Long Island, New York; 1909 to July 1915, Superintendent of Transportation, Montreal & Southern Counties Ry., Montreal.

W. J. Curle, whose appointment as General Superintendent, Chatham, Wallaceburg & Lake Erie Ry., Chatham, Ont., was announced in our last issue, entered railway service with the G.T.R. at Brockville, Ont., about 34 years ago, and about two years later transferred to the C.P.R., being successively, car checker, telegraph operator, night agent, outside agent, and General Yardmaster at Carleton Place, Ont. He was appointed Superintendent, Brockville, Westport & Northwestern Ry., Brockville, Ont., in Aug., 1904, and subsequently also General Freight and Passenger Agent, and from July, 1914, to Aug., 1915, was Superintendent, Toronto Division, Canadian Northern Ry., Toronto; Aug. to Oct., 1915, Superintendent, Lake Superior District, C.N.R., Capreol, Ont.; Oct., 1915, to March, 1916, Assistant Superintendent, Toronto District, C.N.R., Toronto.

Malcolm M. Inglis, whose appointment as Manager, Port Arthur Civic Ry., Port Arthur, Ont., was announced in our last issue, was born in Lanarkshire, Scotland, Oct. 10, 1884, and between Sept. 1901 and Nov. 1908 served a regular apprenticeship with Mavor & Coulson, Ltd., engineers and electricians, Glasgow, Scotland towards the latter portion of that period acting as assistant designer in the machinery department there. From Nov. 1908 to Aug. 1909, he was chief tester and erector for Johnson & Phillips, Ltd., London, England; Aug. 1900 to 1910, assistant designer of machinery, British Electrical Engineering Co., Ltd., Loughborough, England; 1910 to 1911, Chief Electrical Engineer, W. Y. Craig & Co., Ltd., Brynkinalt Collieries, North Wales; 1911 to the date of his present appointment, Electrical and Consulting Engineer for the Town of Yorkton, Sask.

F. D. Burpee, Superintendent, Ottawa Electric Ry., Ottawa, Ont., who has been granted leave of absence for military service, has been given command of no. 1 company, 207th Battalion, with rank of captain. He was born at Ottawa Apr. 25, 1876 and commenced railway work in 1891 under H. B. Spencer, Superintendent, District 4, Eastern Division, C.P.R., Ottawa. He entered electric railway service in 1893, since when he was to 1896 stenographer; 1896 to 1898 cashier and paymaster; 1908 to Aug. 1912, accountant, during which time he also acted as assistant to the Secretary-Treasurer and Superintendent. He was appointed Superintendent in Aug. 1912, when J. E. Hutcheson resigned to enter Montreal Tramways Co's service. In 1894 he enlisted in the Ottawa & Carleton Rifles and was afterwards in the O.A.A.C.Co. of the 43rd Regiment, which he rejoined last year. He has taken an active part in athletics, particularly canoeing and swimming.

In connection with the death of **W. W. Chisholm**, Electrical Engineer, Windsor, Essex and Lake Shore Rapid Ry., Kingsville, Ont., mentioned in our last issue, we have been advised that so far as can be ascertained, the accident happened as follows: Owing to the heavy snow storm the cars were blocked at a cut near Leamington, and Mr. Chisholm with some employees, was endeavoring to get the cars moving. One truck of a passenger car was off the track. The car had been moved a few inches by use of the truck, and before making another move, he

went between the car and a locomotive to straighten out a drawhead. He laid his hand on the drawhead of the passenger car and gradually collapsed, one of the employees noticing a slight puff of smoke from the hand that was resting on the drawhead. He was wearing rubber boots, and after a careful investigation, the opinion was arrived at that one hand came in contact with the rail when the other was touching the drawhead, that the car must have been entirely insulated from the rail by snow and ice and that his body formed a circuit between the car and the ground.

Brantford Municipal Railway Report.

The Brantford, Ont., Municipal Ry. Commissioners, C. H. Hartman, F. J. Colbeck and W. R. Turnbull, have presented a report for the six months ended Dec. 31, 1915, from which the following are extracts:—

EARNINGS.	
Passenger earnings, city lines	\$25,839.29
Passenger earnings, Grand Valley line	24,492.10
Freight earnings	1,704.91
Miscellaneous earnings	1,356.67
	\$53,392.97
EXPENDITURE.	
Power	\$ 8,943.53
Maintenance	14,735.22
Operating wages and expenses and miscellaneous expenses	16,893.33
	40,482.08
Gross surplus	12,910.89
Bond and debenture interest	\$ 8,658.00
Sinking fund	2,600.00
	11,258.00
Net surplus	\$ 1,652.89
The deficit for the 6 months to June 30, 1915, was \$3,202.45, leaving a net deficit for the year of \$1,549.56.	
ASSETS.	
Original property and betterments	\$453,206.29
Cash, stores, etc.	31,200.17
	\$484,406.46
LIABILITIES.	
Capital and bonds	\$395,000.00
City current account	39,121.27
City deferred account	32,397.47
Mortgage	1,500.00
Contingent	9,752.65
Presently payable	8,184.93
	\$485,956.32
Deficit for year ended Dec. 31, 1915	\$ 1,549.56

In Dec., 1915, there was a net surplus of \$1,039.19, and in Jan., 1916, of \$1,695.23, so that the 1915 deficit was wiped out by the Jan., 1916, surplus. The commissioners say: "The statements for January and February show clearly that the property is now on a sound basis, earnings having reached a much more satisfactory level and operating expenses having been very materially reduced. We are now in a position to say with perfect confidence that the days of operation of the property at a loss are past and from this time forward the junior member of the public utilities of the city will take its place among the others as a profitable and wise investment on the part of the citizens." The operating ratios were as follows: August, 89.1%; September, 91.1%; October, 86.3%; November, 86.3%; December, 68.3%; January, 59.9%. Following are particulars of passenger traffic:—

	City lines.	Grand Valley.
Car mileage	161,242.01	86,609.5
Passengers carried	554,927	128,598
Passenger earnings	\$26,176.79	\$24,482.20
Passenger earnings per car mile	16.2c.	28.3c.

L. G. Ireland is manager.

The Winnipeg City Council has consolidated the jitney traffic bylaw, making it more concise. No change has been made in the license fee of \$20.

Electric Railway Finance, Meetings, Etc.

Brantford Municipal Ry.—Earnings for three months ended Mar. 31, \$25,716.59; operating expenses, \$17,356.87; net revenue, \$8,359.72. Fixed charges were \$6,141 for the three months, leaving a balance of \$2,218.72. In accordance with the arrangement with the city council, there is \$1,500 available for application on the 1916 instalment of city deferred account, and \$718.72 for the reduction of city current account.

British Columbia Electric Ry., and allied companies:—

	Jan. 1916	Jan. 1915	Jan. 1914	Jan. 1913
Gross earnings	\$591,949	\$640,495	\$3,832,095	\$4,639,394
Expenses	477,927	497,150	3,363,249	3,571,739
Net earnings	114,022	143,325	468,846	1,067,655

	Feb. 1916	Feb. 1915	Feb. 1914	Feb. 1913
Gross	\$572,565	\$558,512	\$4,105,030	\$5,197,906
Expenses	476,413	469,187	3,839,742	4,440,327
Net	99,522	89,325	565,288	1,156,981

Calgary Municipal Ry.—The audit of the city accounts for the year 1915 is announced as showing that the municipal railway made a profit of \$391 instead of the deficit which it was anticipated would have been shown.

Lethbridge Municipal Ry.—Earnings for March, \$4,429.05, against \$3,494.37 for Mar., 1915.

Moncton Tramways, Electricity & Gas Co.—The annual meeting was held at Moncton, N.B., April 12, E. B. Reesor, Vice President, Pittsburg, Pa., in the chair. The following were elected directors for the current year: T. N. Barnsdall, R. Law, Jr., E. B. Reesor, T. O. Sullivan, F. W. Sumner, J. A. L. Henderson and E. O. Bartlett.

Port Arthur Civic Ry.—Passengers carried in March, 164,483, against 142,982 in February and 152,754 in January.

Saskatoon Municipal Ry.—Total revenue for February, \$16,215.26; operating expenses, \$10,337.06; balance, \$5,878.20; capital charges, \$4,575; net profit, \$1,303.20; total miles run, 61,004; total passengers, 314,660; receipts per car mile, 26.581c; operating expenses per car mile, 16.945c; capital charges per car mile, 7.500c; total k.w.h., 157,090; k.w.h. per car mile, 2.575; average passengers per car mile, 5.158.

Saskatoon Municipal Ry.—Total revenue for March, \$17,690.02; operating expenses, \$11,396.46; balance, \$6,293.56; capital charges, \$3,781.09; net profit, \$2,512.47; miles run, 62,085; passengers carried, 344,953; traffic receipts per car mile, 28.493c; operating expenses per car mile, 18.356c; capital charges per car mile, 6.090c; total k.w.h. 169,090; k.w.h. per car mile, 2.723; average passengers per car mile, 5.556.

Sherbrooke Ry. & Power Co.—A press report states that negotiations are being carried on for the sale to the City of Sherbrooke of the railway part of the company's undertaking.

St. Thomas Electric Ry.—A proposal was submitted to the St. Thomas, Ont., City Council, April 12, by the London & Lake Erie Ry. & Transportation Co., for the operation of the lines within the city now being operated by a committee of the council. The suggestion is to make a contract for one year, its continuance to depend upon the results obtained. The matter is under consideration.

Toronto Ry.—

	City	City	City	City
	1916	1915	1914	1913
Jan.	\$173,784	\$68,847	\$41,496	\$50,488
Feb.	170,464	70,644	44,413	66,917
Mar.	518,555	97,237	188,468	95,141
	\$1,463,103	\$236,698	\$1,400,000	\$212,546

Toronto Ry., Toronto & York Radial Ry., and allied companies:—

	Jan. 1916	Jan. 1915
Gross earnings	\$906,350	\$843,351
Expenses	471,493	440,500
Net earnings	434,857	402,851

	Feb. 1916	Feb. 1915	Jan. 1 to Feb. 29, 1916	Jan. 1 to Feb. 28, 1915
Gross	\$896,266	\$767,326	\$1,752,606	\$1,610,677
Expenses	429,339	411,833	931,032	852,333
Net	386,717	355,493	821,574	758,344

Winnipeg Electric Ry.:—

	Jan. 1916	Jan. 1915
Gross earnings	\$297,560	\$350,682
Expenses	189,085	204,206
Net earnings	108,475	136,476

	Feb. 1916	Feb. 1915	Jan. 1 to Feb. 29, 1916	Jan. 1 to Feb. 28, 1915
Gross	\$297,560	\$314,658	\$ 590,810	\$665,340
Expenses	185,000	194,565	374,085	408,771
Net	108,250	120,093	216,725	256,569

Manitoba Taxation of Electric Railways.

The act amending the Corporations Taxation Act, passed by the Manitoba Legislature recently, increases the taxation to be levied upon electric railways. The act provided in sec. 3, par. 1., that "Every street railway company in Manitoba and every company working or operating a railway or part thereof entirely or partly by electricity in the province for the carrying of passengers, shall pay a tax of \$500" a year for 20 miles or less and \$10 a mile for every mile in excess, single track, one mile of double track to count as two miles; switches, sidings, tracks into car sheds, Y's and portions of track not in general use to be exempt.

The new act repeals the foregoing paragraph and substitutes the following: "Every street railway company in Manitoba, and every person or corporation other than a municipality working or operating a railway or part thereof, entirely or partly by electricity, in the Province of Manitoba, for carrying passengers shall pay a tax of: \$30 per mile, if the mileage does not exceed 15 miles; \$40 per mile, if the mileage exceeds 15 miles but does not exceed 30 miles; \$50 per mile, if the mileage exceeds 30 miles but does not exceed 50 miles; \$60 per mile, if the mileage exceeds 50 miles. In all cases the mileage shall be computed on the single track, each mile of double track being counted as two miles of single track; switches or sidings, tracks into car sheds, Y's and portions of track not in general use shall be excluded from the computation of mileage."

It was stated by the Provincial Treasurer when the measure was before the Legislature, that the new tax is on the same level as that levied on similar companies in Saskatchewan and Alberta, and he also intimated that there would likely be a further increase after the war. It was stated in the discussion that the Winnipeg Electric Ry., which is the only railway in the province that will be affected, will have to pay an increased tax of \$6,737.13 a year.

Tax on Railway Tickets in England.—The British Government has withdrawn the tax on railway tickets. It was stated in the House of Commons recently that the expense and trouble required to collect the tax so depleted the £3,000,000 which it was expected to gain, that it had been decided not to persist in the collection.

W. Menard, a telegraph operator at Richmond, Que., has been held to be criminally responsible for the death of W. Gagnon, locomotive fireman, in a train wreck on the G.T.R., near Richmond, Feb. 28.

Electric Railway Projects, Construction, Betterments Etc.

Brantford Municipal Ry.—The Dominion Parliament has authorized the City of Brantford to maintain and manage the Grand Valley Ry. as fully and effectually as the G.V.R. Co. might do, and to extend the existing railway from Brantford to Cainsville, Ont. The city council is to be subject to any bylaws made between the company and any municipality, and shall pay taxes in such municipalities to the same extent as the company would have been liable for. As far as the Parliament's power extends, the control of the railway is vested in the Brantford Municipal Railway Commission.

The Calgary Municipal Ry. contemplates building two miles of temporary track to the Sarcee Military Camp. Materials are on hand. Track will be laid to within 440 yards of the camp. The estimated cost is \$6,000 to \$6,800, which it is proposed to pay out of revenue, and the material, so far as it is available, will be used elsewhere when the camp is removed. (Sept. 1915, pg. 359.)

Hamilton & Brantford Ry.—A new shelter has been erected at the Murray St. crossing, Brantford, Ont.

We are officially advised that the question of physical connection with the Lake Erie & Northern Ry. in Brantford, and the construction of a joint station there is being arranged for. (See Lake Erie & Northern Ry.)

Lake Erie & Northern Ry.—A press report states that it is expected that the section of this railway between Brantford and Port Dover, Ont., will be opened for traffic, May 15. This will give a through line operated by electricity, Galt to Port Dover, 50.3 miles.

A contract has been let to Schultz Bros. Co. for the erection of a station building at the south end of Lorne Bridge, Brantford, which will be used jointly with the Hamilton & Brantford Ry. The estimated cost is about \$40,000. The agreement for the building and use of this station has not yet been formally approved by the H. & B. Ry., the Brantford City Council and the Board of Railway Commissioners. (April, pg. 156.)

Morrisburg & Ottawa Electric Ry.—J. A. Kilt, President, informed the Ontario Legislature's Railway Committee, Mar. 31, that it is proposed to spend \$30,000 on surveys and other work connected with the railway during this year, and he asked for an assurance that the bonding power would be increased to \$40,000 a mile. The committee did not feel that it was justified in acceding to this request, and the matter stood over for consideration by the Legislature. (April, pg. 115.)

Nelson Street Railway.—A press report states that H. P. Thomas has been retained by the Nelson, B.C., City Council to prepare plans and estimate cost of extending the municipal railway along Baker St. from Josephine to Cedar Sts. and on Vernon St. from Cedar to Josephine Sts. F. C. Ingram is Superintendent and Chief Engineer.

Niagara, St. Catharines & Toronto Ry.—The station at Standard, Ont., was destroyed by fire April 2. A press report states that a larger and up to date station is to be built at once in its place. (Jan., pg. 30.)

Ottawa Electric Ry.—We are officially advised that the City Council has decided

to lay a new asphalt pavement on Rideau St., between Sussex and Waller Sts. The company has on hand the 108 and 115 lb. T rails required, and expects to proceed with track laying some time in May. (Oct., 1915, pg. 318.)

Port Arthur Civic Ry. will renew about half a mile of track from Argyle St. to Arthur St. this year.

St. John Ry.—Residents of the parish of Simonds are asking the New Brunswick Legislature to compel the company to carry out an agreement made in 1914 for the extension of the company's railway into that area. An agreement between the parties is expected to be reached as to when the work will be undertaken. (April, pg. 156.)

Winnipeg Electric Ry.—The question of the extension of the Academy St. line, to the Midland Ry. of Manitoba, and of the Talbot Ave. line from Roland to Cameron Sts., is under discussion. Both matters are being considered by committees of the Winnipeg City Council. (April, pg. 156.)

Nipissing Central Railway Report.

The Nipissing Central Ry., 12.64 miles, is owned by the Province of Ontario, and is operated by the Timiskaming & Northern Ontario Ry. Commission. The report for the year ended Oct. 31, 1915, gives the following statistics:—

Revenue from transportation	\$105,458.49
Other revenue	1,252.13
Total operating revenue	\$106,710.62
Maintenance of way and structures	\$12,809.80
Maintenance of equipment	6,840.72
Traffic expenses	474.39
Transportation expenses	45,689.44
General and miscellaneous	8,737.11
Total operating expenses	74,551.46
Net operating revenue	\$ 32,159.16
Other income	268.00
Total income	\$ 32,377.16
Rent for lease of road	\$ 7,254.98
Taxes	27.19
	7,282.17
Net result	\$125,094.99
PROFIT AND LOSS ACCOUNT.	
Balance from 1913-14	\$ 27,397.97
Net revenue from operation	25,492.96
	\$ 52,492.96
Townsite balance	\$ 2,382.03
Interest on advance from T. & N.O.R.	23,233.90
Paid Treasurer of Ontario	25,000.00
	50,615.93
Balance carried forward	\$ 1,877.03
ASSETS.	
Cost of road	\$298,815.70
Cost of equipment	74,290.98
Townsite property	244,197.75
Working assets	62,591.23
Deferred debit items	48.20
Franchise	141,388.32
	\$821,327.18
LIABILITIES.	
Capital stock	\$530,000.00
Advance from T. & N.O.Ry.	229,194.16
Working liabilities	60,255.99
Profit and loss balance	1,877.03
	\$821,327.18

The statistics of operation for the year are as follows:—

Passenger car hours	27,326
Passenger car miles	280,157
Passengers carried	1,367,902
Average daily receipts	\$288.92
Average receipts per car hour	\$3.38
Average receipts per car mile	38c.
Freight car hours	470
Freight car miles, loaded	2,077
Freight car miles, empty	1,861
Average receipts per freight car hour	\$14.37
Average receipts per freight car mile	\$1.25

Electric Railway Notes.

The Windsor, Essex & Lake Shore Rapid Ry. is going to do some paving in Leamington and Windsor, Ont.

The London St. Ry. is considering the question of double tracking about 2,000 ft. beyond the Exhibition Ground on Dundas Street East.

The Windsor, Essex & Lake Shore Rapid Ry. is in the market for some 80 lb. steel T rails, angle bars, tie plates, track bolts, and cedar and oak ties.

The Winnipeg Electric Ry. has agreed to put on a service of two cars across the Arlington St. bridge, as required by the Manitoba Public Utilities Commission.

The Brandon, Man., Municipal Ry. started operating cars on its electric railway April 12, after having been out of operation, owing to snow and ice, since Jan. 25.

The Port Arthur Civic Ry. has altered one of its cars so as to be operated by one man, and it is proposed to put two such cars in operation on the north belt and one on the south belt line.

The St. Thomas Ont., City Council has raised the wages of the conductors and motormen on the municipal railway from 22 to 25c an hour after six months service. New men are to be started at 22c.

A new traffic bylaw went into force in Vancouver, B.C., April 3, the principal feature of which is that pedestrians are forbidden to cross the streets within certain bounds, in the centre of the city, except at intersections.

The Toronto Civic Ry. employees decided Apr. 11, not to ask for an increase in wages for the present, as according to a resolution passed by them they realize that any increase would mean increased taxation on the ratepayers.

The Saskatoon, Sask., City Council is being asked by Roman Catholic residents to start the Sunday car service on the municipal railway half an hour earlier so as to enable them to use the cars to attend 9 o'clock mass. The question of the cost of the additional service is under consideration.

The Port Arthur, Ont., Public Utilities Commission has been considering a proposal to sell street railway tickets at 7 for 25 cents, and to collect 2 tickets for the run between Port Arthur and Fort William. The Fort William authorities decided April 1, that they would not agree to the proposition.

The Montreal City Council has sent on to the Department of Railways for transmission to the Board of Railway Commissioners, plans for the proposed subway under the Lachine Canal at Wellington St. The estimated cost of the work is \$1,250,000, part of which will be borne by the Montreal Tramways Co., and the Dominion Government.

The Board of Railway Commissioners has authorized the London & Lake Erie Ry. & Transportation Co. to sell through passenger tickets from points on its line to points on, or via, the Michigan Central Rd., and the latter is required to honor such tickets, subject to the condition that prompt accounting therefor be made by the issuing company.

The Sandwich, Windsor & Amherstburg Ry. has ordered 2 single truck, double end, p.a.y.e., city cars, from Preston Car & Coach Co. They will have bodies 21 ft. long, mounted on 21E trucks with 8 ft. wheel base, and will be equip-

ped with 2 Canadian Westinghouse motors, 2 trolleys, electric heating system, push buttons and leather upholstered seats.

The Brantford Municipal Ry. Commission approved April 5, a new wage schedule for conductors and motormen, to date from April 1, as follows: First month, 16c an hour; first year, 18½c an hour; second year, 20c; third year and thereafter, 21c, which gives a 5% increase all round. It was also decided to permit the use of stools for motormen if sanctioned by the Ontario Railway and Municipal Board.

The Quebec Ry., Light and Power Co. is building at its Ste. Anne de Beaupre shops, 4 double truck, p.a.y.e. city cars, similar to its class 600 cars now in use. Following are the chief details:—

Seating capacity	40
Bolster centres, length	18 ft.
Length over body	29 ft. 8 ins.
Length over all	40 ft.
Width over all	8 ft.
Body, material	wood and steel
Interior trim	Canadian red birch, stained mahogany
Headlining	Agasote
Roof	arch type

The Court of Review at Montreal, in dealing with a claim against the Hull Electric Co., recently, found that the company was guilty of negligence if it did not provide such guards for the front wheels of its cars as would prevent persons who fall on the track from being run over, and that the necessity of providing a "cow catcher" on its cars when operating in rural districts, did not relieve it from providing protection by means of a fender when the cars were being operated on city streets.

The Three Rivers Traction Co., Three Rivers, Que., has ordered three cars from the Ottawa Car Manufacturing Co., for delivery by July 1. Two of them will be single truck, single end, one man, near side, and one will be single end, double truck type, and generally similar to those previously supplied, which were described and illustrated in Canadian Railway and Marine World for Dec. 1915. The bodies will be mounted on radiax trucks and equipped with Westinghouse 101-B-2 motors, straight air brakes, life guards, scrapers, Coleman stationary fare boxes, ventilators, folding doors and steps, and heated with cross seat heaters, 10 per car. The dimensions will be:—

Length of body	21 ft.
Length of front vestibule	6 ft. 2 ins.
Length of rear vestibule	4 ft.
Length over all	32 ft. 2 ins.
Width over all	8 ft. 6 ins.

British Columbia Accident Case.—In Sept., 1914, some cars belonging to the British Columbia Electric Ry. were standing on a siding on Main St., Vancouver, ready for unloading, when they were liberated by some mischievous boys, with the result that two persons were killed and several injured. Actions were brought against the B.C.E.Ry., and the Dominion Creosoting Co., to which the cars were consigned to recover damages, and in two of the three cases decided, the juries found both companies liable. Other cases were held over pending an appeal. Judgment on the appeal case was delivered April 12, and placed the entire responsibility for the accident on the B.C.E.Ry. An appeal will be made to the Imperial Privy Council by the B.C.E.Ry., but the Court of Appeal declined to allow all the cases to be consolidated for the purposes of the appeal.

Regina Municipal Railway Earnings, Etc.

Following are statistics for February, compared with those for Feb., 1915.

	Feb. 1916.	Feb. 1915.
Total revenue	\$17,166.79	\$14,418.62
Expenses	17,216.17	14,346.13
Capital charges	6,963.80	9,137.58
Adjustment charges	49.38	72.49
Operating deficit	9,113.18	9,065.09
Total deficit		
Expenses per car mile without power	17.90c.	14.53c.
Expenses per car mile with power	24.01	19.42
Platform wages per car hour	19c.	72.56c.
Passengers carried	65	289,421
Expenses, less capital charges, percentage		100.29
Expenses with capital charges, percentage		152.51

British Columbia Hours of Labor.

British Columbia Electric Ry. employees have been asking the Provincial Government to pass an act to give them one day off work in every seven days. Several conferences have taken place between the company, the employees and the Government. A statement was made by the Premier in April, to the effect that the Government had come to the conclusion that the men, who number about 1,300 in the three cities, were entitled to one day in seven, or at least one day in eight, which some of the men suggested would satisfy them for the present. The government preferred not to bring down any drastic legislation on the subject, especially as the company had agreed to bring forward a new schedule which would provide for one day in seven or eight. The government would, however, bring in an amendment to the Railway Act giving the Lieutenant Governor in Council power to provide for such a regulation, but there was no intention to enforce it against the company if the latter carried out the compromise now arranged which is satisfactory to the men and which the company agrees to put into effect.

Port Arthur-Fort William Traffic.—In connection with the proposal to give 7 tickets for 25c, and using 2 tickets for the trip between Port Arthur and Fort William, Ont., a report prepared for consideration by the Port Arthur Public Utilities Commission respecting traffic for 1915, shows that 2,096,830 fares were paid, and 407,719 transfers issued. The traffic was distributed as follows: Main line, 66.25%; Arthur St. line, 11.95%; north belt line, 13.45%; south belt line, 8.35%. Of the traffic on the main line, 46.3% travelled on the interurban line. The proposed change would mean a reduction of revenue on the cars of the fast traffic, which would have to be made up by increased traffic, and the question is whether there would be such an increase mainly within the city, to justify the reduction.

Johnson St. Bridge, Victoria, B.C.—The Premier of British Columbia informed the Victoria city bridge committee, recently, that the government was prepared to give an additional \$25,000 towards the building of this proposed bridge, making its contribution \$200,000, and to secure from the British Columbia Electric Ry. either by negotiation or legislation, a contribution of \$50,000. The Canadian Northern Pacific Ry. is contributing \$25,000, but it is not said whether the Esquimalt and Nanaimo Ry. is making a contribution or not. The B. C. Electric Ry. says it will be time enough to discuss the amount of its contribution towards the cost of the bridge, when, if ever, it would be determined to use it, and that the cost of rearranging its tracks so as to run over the proposed bridge would be an expensive matter.

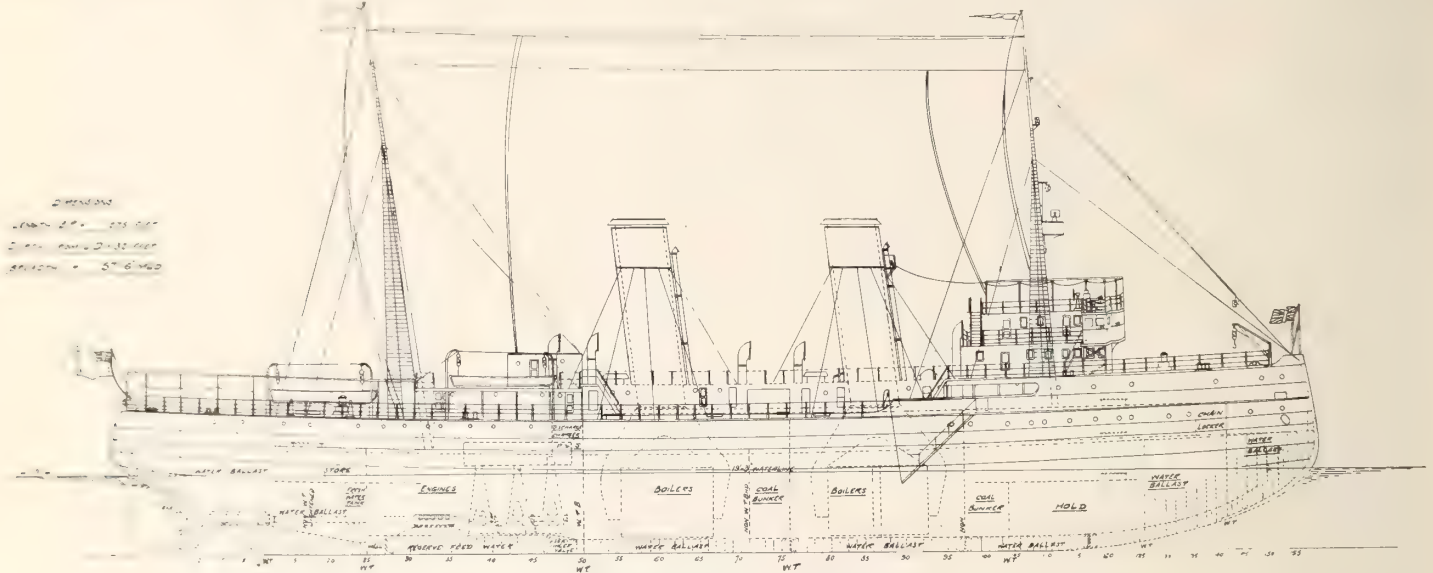
Marine Department

Icebreaking Steamship for the St. Lawrence River.

The Dominion Government icebreaking steamship, which will, it is expected, be launched at Maisonneuve, Montreal, shortly, was ordered early in 1914, from Canadian Vickers Ltd., the contract price being \$998,593, and delivery was required by the autumn of 1915. A considerable

i.h.p. 8,000; speed 15 to 16 knots an hour. She is of the twin screw type designed to work through the ordinary sheet ice formed in the river, from 12 to 30 ins. thick, and packed ice formed in certain parts of the river, particularly at Cap Rouge, will with the displacement and

in conjunction with the double bottom, which extends the full length of the vessel, a double skin extending from the engine and boiler room bulkhead right forward. Access from below to these watertight compartments is provided for by watertight doors. Large trimming



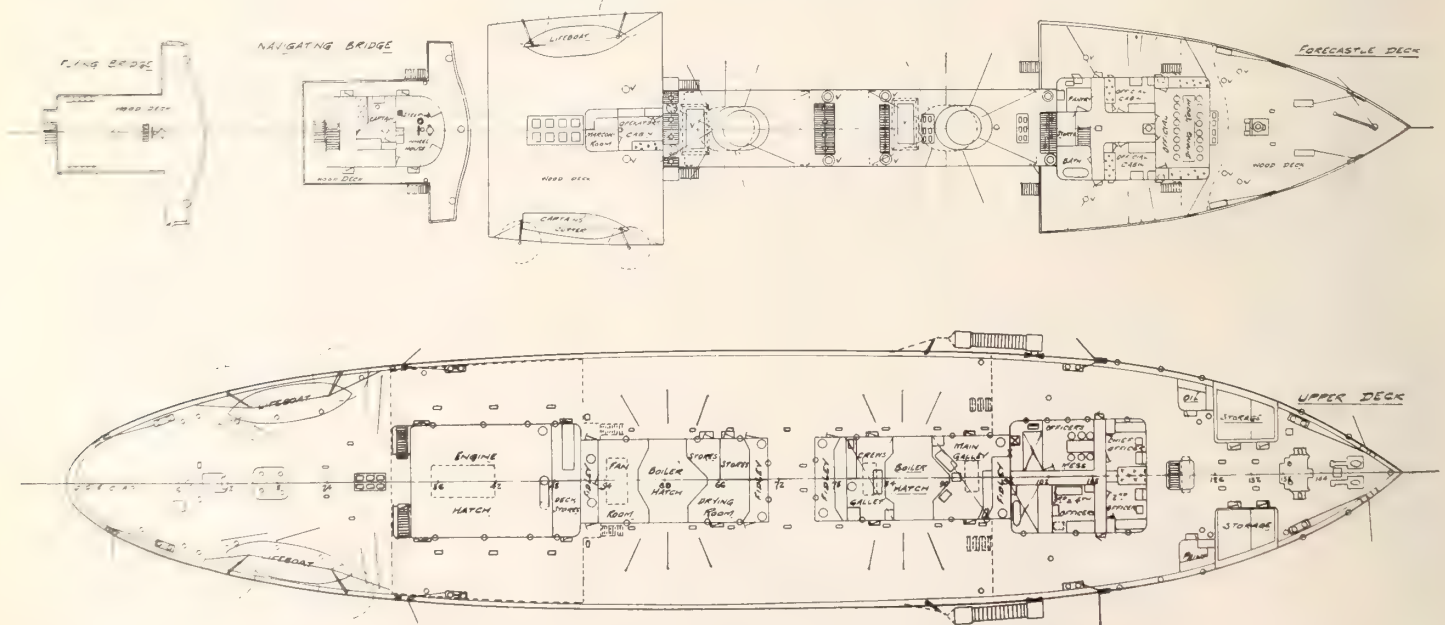
Icebreaking Steamship for St. Lawrence River.

amount of work was done on the hull during the following months of the year, but when war broke out in August, it was found necessary to suspend all outside work, in order to deal with more pressing requirements. Since work on the ice-breaker was resumed, very quick progress has been made.

power developed, be successfully coped with. She is of massive construction, built to Lloyd's requirements for class 100 A1. The stem a massive steel casting, is raked aft, and the stern, which is of the cruiser type, will allow of easy propulsion and steering when going astern amongst ice. The watertight sub-

tanks are placed forward and aft, connected with special pumping arrangements, so that the vessel may be trimmed quickly.

The framing amidships and approaching the ends forward and aft, is of heavy channel section 12 ins. deep, spaced 18 ins., and at the extreme ends of the ves-



Icebreaking Steamship. General Arrangement of Upper and Forecastle Decks.

The vessel was designed as an ice-breaker only, the intention being that she will lay up during the summer. The principal dimensions are: length over all 292 ft., breadth moulded 57½ ft., depth moulded 32 ft., draught mean 19¼ ft.; sheer forward 4½ ft., sheer aft 2 ft.;

division is very complete, there being seven main transverse watertight bulkheads extending to the upper deck. The side bunker walls are also watertight to the upper deck, and an inner skin is provided between the fore peak and the forward bunker, the bulkheads thus forming,

sel the spacing is reduced to 15 ins. The complete framing is bound in every way practicable in order to form a complete structure, in itself independent of the outer plating. At the icebreaking water line, and running fore and aft for the complete length of the vessel, a special

ice belt is fitted, 10 ft. deep, 1½ in. thick at the stem and 1 in. at the stern. Forward in the bows and from the bottom of the ice belt to the keel plate, the plating is for a considerable distance aft 1½ in. and 1 in. thick respectively.

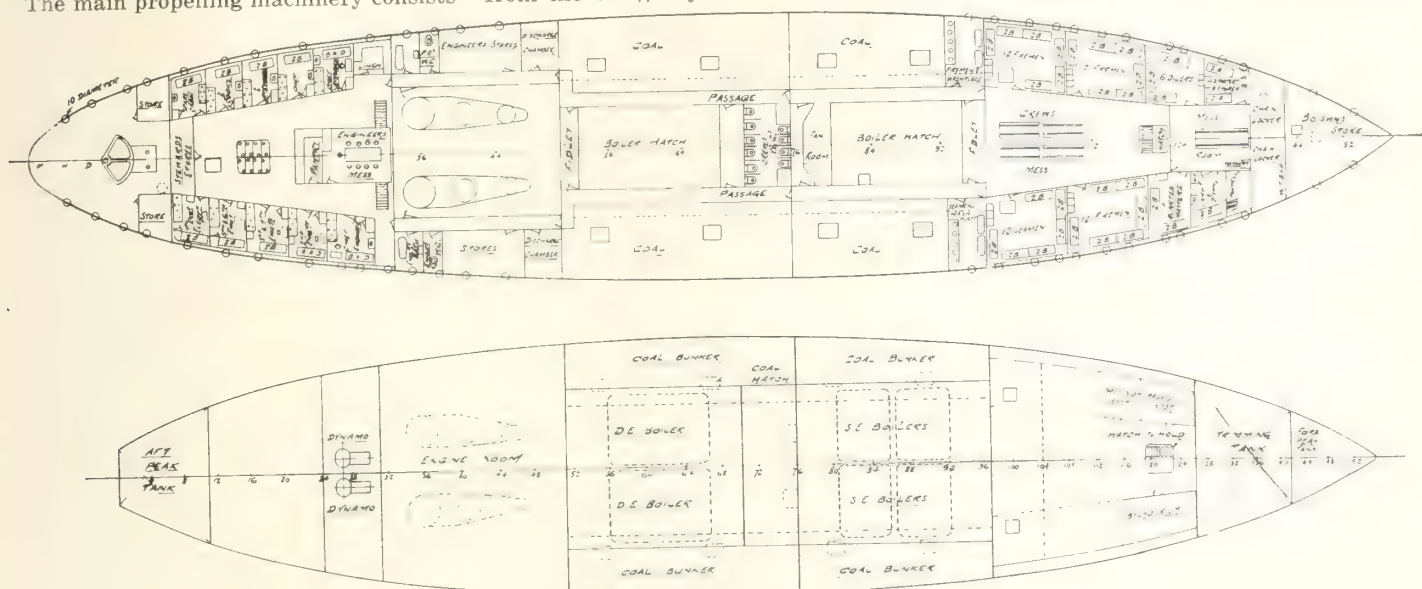
The main propelling machinery consists

The lifesaving appliances are in accordance with the latest rules of the Canadian Steamboat Inspection Act, and include four lifeboats and one cutter.

The deck machinery consists of powerful steam steering gear aft, controlled from the bridge by telemotor, and fitted

Loss of the s.s. Pilot Investigated.

An investigation was held at Quebec, recently, by Capt L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. C. Koenig and L. R. Demers, as nautical assessors, into the causes of the loss of the

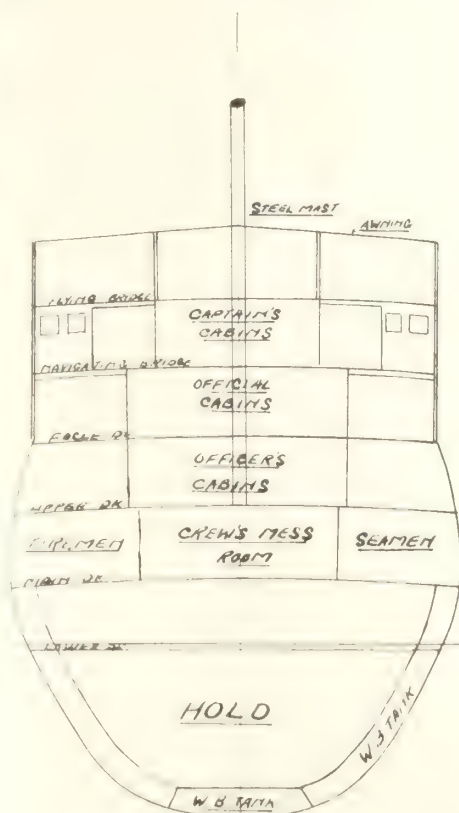


Icebreaking Steamship. Main and Lower Decks.

of twin screw, triple expansion, surface condensing engines, with cylinders 28, 46 and 75 in. diam., by 48 in. stroke, capable of developing 8,000 collective i.h.p., when running at 100 r.p.m. The shafting is made stronger than actual requirements, to withstand the shock, should the propellers strike solid ice, and the propellers themselves are especially strong, being of nickel steel. Independent air, feed and bilge pumps of extra large capacity are provided and the engine room auxiliary equipment is very complete. Steam is supplied to all machinery by two double ended and four single ended boilers of the return tubular type, having a grate area of about 560 sq. ft., and delivering steam at 180 lb. pressure, working under forced draught. All the boilers will supply steam to the main engines, and connections for the auxiliary steam main are also led from three of the single ended boilers. Ash ejectors and steam ash hoists are provided in the various stokeholds.

Accommodation on the main deck is provided for the engineers and stewards, etc., while forward on the same deck are the quarters for the crew and petty officers. On the upper deck at the forward end of the casing are the officers' quarters and mess room. The two galleys are located on this deck in the casing, and communicate with all messing quarters by dumb waiters. In the fore-castle are two houses for cold storage with cook's day stores alongside. The official accommodation is located on the fore-castle deck, and consists of two official cabins, pantry, bath and w.c., and combined dining saloon and chart room. The wireless telegraph cabin and operator's room are on the boat deck aft, and the captain's cabin and wheel house are on the navigating bridge. Complete hot and cold fresh water, sanitary and steam heating systems are fitted throughout the vessel, and also electric light. A searchlight of 25,000 candle power is also provided and fitted on the fore side of the foremast. Electric current is supplied by two direct current compound dynamos direct driven by high speed enclosed compound engines.

with hand gear at the engine, a windlass, two capstans and boat and coal hoists. Special arrangements have been made for coaling and mooring equipment.



Icebreaking Steamship. Section in Way of Deck Houses, Frame III, looking forward.

Universal Transportation Co., Ltd., has been incorporated under the Dominion Companies Act with \$100,000 authorized capital and office at Toronto, to own and operate steam and other vessels, docks, wharves and other transportation facilities, and to carry on a general transportation business for passengers and merchandise.

Quebec & Levis Ferry Co.'s s.s. Pilot, Jan. 18, on Red Island in the River St. Lawrence, when en route from Riviere du Loup to Saguenay. The master, A. Deschenes, gave evidence that his log was lost and that he encountered much ice, but that the weather was clear. After steering a tortuous course to avoid ice floes, he met with a large field of ice extending some 200 to 300 ft. on his port side, and he chose what appeared to be the narrowest part to enter with the idea of breaking a passage. The ice appeared to be about an inch above the surface, thus indicating a depth of about 11 ins. He entered at full speed to two-thirds of the vessel's length when she stopped. He then tried to work out of the ice, but without success, the vessel being wedged in. In the meantime the tide was ebbing at about 6 miles an hour, and he realized that the vessel was being brought on to Red Island, and when she grounded there, a boat was lowered and all hands landed, as nothing could be done to save the vessel after she grounded.

The court finds that the master showed lack of judgment in entering the ice floe where he did and failing to take into consideration the strength of the ebb and his distance from Red Island, and it cannot conceive why the vessel could not extricate herself from the ice if the conditions were as stated. While the court only charges the master with an error of judgment, it deprecates the system whereby a man holding a minor inland water certificate only, is entrusted with such a responsible position to navigate the St. Lawrence during the winter, a post which requires knowledge acquired by experience only, and it claims that his experience was not sufficient for the position and had there been loss of life, its remarks would have been more severe. The master cannot be held at fault if the owner chooses to engage him, but the master, A. Deschenes, was reprimanded and cautioned to exercise better judgment in future, and the court considers it would have been preferable for him to have waited a more fitting opportunity to enter the ice, and that the mate had not suffi-

cient experience to assist the master. The court also remarked that the qualifications of the master, in virtue of his certificate, may be sufficient for ordinary circumstances, but absolutely insufficient, owing to his lack of experience, in such a trade, and therefore, if the owner is anxious for the safety of his property, it behooves him to seek the best experienced man available, and this should be enforced, especially when vessels are engaged in carrying passengers, and it expressed surprise when it heard from the evidence that the Pilot was licensed to carry 390 passengers and had but one lifeboat and two canoes as life saving apparatus.

Canada Steamship Lines Appointments.

H. W. COWAN, heretofore Operating Superintendent, Freight Steamships, Toronto, has been appointed Operating Manager. Office, Montreal.

GILBERT JOHNSTON, heretofore Mechanical Superintendent, Montreal, has been appointed Consulting Engineer.

R. DUGUID, heretofore Superintending Engineer, Toronto, has been appointed Mechanical Superintendent, vice G. Johnston. Office, Montreal.

JOHN F. PIERCE, heretofore General Passenger Agent and General Baggage Agent, has been appointed Assistant Passenger Traffic Manager. The position of General Passenger Agent has been temporarily abolished. Office, Montreal.

C. C. BONTER, heretofore Special Agent, Montreal, has been appointed General Baggage Agent. Office, Montreal.

W. J. KING has been appointed Division Freight Agent, Montreal, vice J. J. Nelligan, who has joined the Canadian Expeditionary Forces.

D. OLIVIER, heretofore ticket agent, Montreal, has been appointed City Passenger Agent, in charge of the ticket office and excursion business and about Montreal.

D. M. CRITES has been appointed Soliciting Freight Agent, Montreal.

JOHN V. FOY, heretofore General Agent, Buffalo, N.Y., has been appointed Assistant General Passenger Agent. Office, Toronto.

F. J. GRAHAM, who has been in the service for some time in different capacities, including purser and dock ticket agent, has been appointed City Passenger Agent, Toronto, in charge of city and dock offices.

A. A. AULD has been appointed Superintendent of Terminals, with jurisdiction over Toronto, Niagara on the Lake, Queenston, Lewiston and Charlotte terminals, for both passenger and freight steamships. He will have charge of the physical operation of the docks and steamships at these points, and agents will work under his jurisdiction in respect of the handling of freight to and from the steamships, and also any changes in passenger schedule. Captains and engineers will report immediately on arrival any necessary repairs to their vessels to him, and he will consult with the Mechanical Department. He will also be responsible through the Passenger Department for the sailing time of vessels, change of schedule and all orders to captains and engineers affecting this. Office, Toronto.

C. E. CROFT, heretofore General Agent, Toronto, has been appointed Chief of Commissary Department. Office, Toronto.

A. E. RANKIN, heretofore Soliciting Freight Agent, Toronto, has been ap-

pointed Soliciting Freight Agent, Hamilton, Ont., succeeding W. J. Robinson, promoted.

S. J. MURPHY has been appointed Travelling Passenger Agent, Niagara Falls, N.Y., the same position as he had

last navigation season.

W. J. ROBINSON, heretofore Soliciting Agent, Hamilton, Ont., has been appointed District Freight Agent, Windsor, Ont.

BROCK BATTEN has been appointed Westbound Freight Agent, Fort William.

Absorption of St. Lawrence and Chicago Steam Navigation Co., Ltd.

After the declaration of a dividend of 10% for 1915, and a bonus of 2%, both of which were paid on Jan. 2, 1916, the St. L. & C. S. N. Co.'s shares, which had risen to 125 in Dec., 1915, sold ex dividend down to 115, but within the following two months a strong demand arose and it soon became evident that some interests were trying to obtain control. Towards the end of March a brokerage firm approached the directors with a view to purchasing the shares, or at least a controlling interest, but the directors did not think the price suggested represented the property's value and issued a circular to shareholders to that effect. The offer is said to have been made on behalf of the Canada Steamship Lines, Ltd., and another offer at an advanced price is said to have been made a little later by the same interests. Then, it is said, Jas. Playfair, of Midland, Ont., and associates made a higher offer, which was followed by a still higher one of \$185 a share by the Canada Steamship Lines interests, which a majority of the directors decided to accept for their individual holdings, stipulating that the purchasers pay the same price to every shareholder depositing stock before May 31, and they issued a circular to shareholders on April 14 recommending their acceptance of the offer.

The vessels involved in the transfer are The Iroquois, built at Toronto in 1902, 1,452 register tons; W. D. Matthews, built at Collingwood, Ont., in 1908, 2,450 register tons; E. B. Osler, built at Bridgeburg, Ont., in 1908, 4,361 register tons, and J. H. G. Hagarty, built at Collingwood, Ont., in 1914, 5,704 register tons.

The report for 1915 showed that after paying a dividend of 10% and a bonus of 2% on the paid up capital stock, amounting to \$115,968, a balance of \$162,522.33 was carried forward to this year, making a balance to the credit of profit and loss of \$393,791.88. The four vessels named were valued at \$1,120,000, and the paid

up capital stock is \$966,400 (nominal \$1,000,000). For some time past the company largely carried its own insurance risk, the insurance fund showing a credit balance at Dec. 31, 1916, of \$135,689.67. The steamship earnings for the year were \$301,690.25.

The company was incorporated in 1890 by S. Crangle, Sir Casimir Gzowski, G. Hagarty, J. H. G. Hagarty, F. W. King-

ston, W. D. Matthews and E. B. Osler, with a capital of \$100,000, and the s.s. Rosedale, which was built at Sunderland, Eng., in 1888, was acquired, and lengthened to full canal size. She was later sold to R. O. & A. B. Mackay, Hamilton, Ont., and subsequently taken over by Inland Lines, Ltd., and afterward by Canada Steamship Lines, Ltd. The s.s. Algonquin, built at Yoker, Scotland, in 1888, was bought from T. Marks & Co., Port Arthur, Ont., in 1893, and lengthened to the same size as the Rosedale. She was sold to the Port Colborne & St. Lawrence Navigation Co. in 1913, and has again been sold recently to A. B. Mackay, Hamilton, Ont. The capital stock of the company was increased in 1893 to \$200,000. The company was particularly free from marine casualties, but suffered the loss of the s.s. James Carruthers, with officers and crew, in the great storm on the lakes in Nov., 1913. This vessel was for a time the largest carrier on the Great Lakes, and was built at Collingwood in 1913, with a register tonnage of 5,606.

The shareholders in the company number 230, which for the capital involved shows a very fair distribution of the stock. Some of the shares are held in Great Britain. The directors are: W. D. Matthews, President; J. H. G. Hagarty, Vice President; A. A. Wright, Managing Director; Sir Edmund B. Osler, C. S. Gzowski, G. R. Crowe, Jas. Carruthers, S. Crangle.

At \$185 a share for the stock the buyers are paying \$1,787,840 for the St. Lawrence property, which, taking into account cash and other assets, amounts to something like \$47 a ton for the four boats. It was stated some time ago that the Canada Steamship Lines had collected insurance under its war risks at the rate of \$68 a ton for every boat lost, and that the sales of boats had been at equally remunerative rates.

The following table shows the company's record from 1901:

	Stock.	Earnings.	Charges.	Balance.	Per cent. on Stock.	Dividend.	Surplus.
1901	\$200,000	\$ 53,654	\$12,380	\$ 41,274	20.63	15	\$ 62,753
1902	350,000	55,312	14,152	41,160	11.76	26 2-3	18,913
1903	563,300	78,888	20,234	58,654	11.05	10	24,640
1904	563,300	81,613	31,945	49,668	8.81	8	29,235
1905	563,300	134,891	27,749	107,142	19.02	10	80,057
1906	563,300	125,050	32,780	92,270	16.38	10	115,996
1907	751,000	113,928	30,770	83,770	11.15	10	101,968
1908	855,700	116,549	56,234	60,315	7.04	7	102,383
1909	860,000	112,930	13,507	99,423	11.56	8	132,007
1910	860,000	42,830	13,994	136,042	15.81	3	136,042
1911	860,000	62,677	14,233	48,443	5.63	5	141,476
1912	860,000	134,031	35,000	99,031	11.51	8	158,645
1913	900,875	150,161	19,357	130,804	14.52	8	222,150
1914	966,400	54,639	20,768	33,871	3.5	3	231,169
1915	966,400	301,690	23,099	278,600	28.82	12	393,791

up capital stock is \$966,400 (nominal \$1,000,000). For some time past the company largely carried its own insurance risk, the insurance fund showing a credit balance at Dec. 31, 1916, of \$135,689.67. The steamship earnings for the year were \$301,690.25.

The company was incorporated in 1890 by S. Crangle, Sir Casimir Gzowski, G. Hagarty, J. H. G. Hagarty, F. W. King-

Yarrows Ltd., Esquimalt, have an order for the construction of a steel, shallow draught river steamboat for India. The contract was originally placed with the parent concern in Scotland, and transferred to Esquimalt, owing to rush of business. The machinery will be supplied from Glasgow, and the whole will be knocked down and shipped to India, where it will be reconstructed.

Steamship Service Between Prince Edward Island and the Mainland.

The Charlottetown Steam Navigation Co. Ltd. advises us that it has decided not to resume its service between Prince Edward Island and the mainland in the spring, and that it will close out its business. For a great many years it has operated steamships between Summerside, P.E.I. and Pointe du Chene, N.B., and between Charlottetown, P.E.I. and Pictou, N.S. During recent years it has run the s.s. Empress between Summerside and Pointe du Chene, and the s.s. Northumberland between Charlottetown and Pictou as long as weather permitted each year, the winter service having been performed by Dominion Government icebreaking steamships between Pictou and Charlottetown when possible and at other times between Pictou and Georgetown, P.E.I. when Charlottetown harbor became blocked. During the past winter this service was given by the s.s. Prince Edward Island and the s.s. Stanley. When ice conditions have prevented the winter boats running, the mails and any passengers compelled to make the journey were conveyed in open boats between Cape Tormentine, N.B. and Cape Traverse, P.E.I., a distance of about 9 miles across Northumberland Strait, and which was the only route available until icebreaking vessels were provided.

In 1864 the Prince Edward Island Steam Navigation Co. was formed to operate between Charlottetown, P.E.I., and Pictou, N.S.; between Summerside and Georgetown, P.E.I., and Port Hawkesbury, N.S.; and between Summerside and Pointe du Chene and Chatham, N.B. The services were performed by the s.s. St. Lawrence and s.s. Princess of Wales. In 1891 the Charlottetown Steam Navigation Co., Ltd., was incorporated under the Dominion law and took over the old company's affairs, the change being one of name only. In 1891 the s.s. Princess of Wales was broken up, the steel s.s. Northumberland taking her place. The St. Lawrence was sold in 1896. The steel s.s. Princess took her place. The latter vessel was sold in 1906 to the Marine and Fisheries Department, her place being taken by the steel s.s. Empress. The present directors of the Charlottetown S. N. Co. are: W. W. Owen, President, A. E. Ings and John Richards.

The Charlottetown Steam Navigation Co. has sold its s.s. Northumberland to the Dominion Trade and Commerce Department, and has about completed arrangements for selling the s.s. Empress, but the name of the latter's purchaser is not yet available. It is said to be the Trade and Commerce Department's intention to run the Northumberland this year between Summerside and Pointe du Chene and to carry on the service between Charlottetown and Pictou with the C.G.S. Stanley, owned by the Marine and Fisheries Department, but a later report says the Stanley is not suitable for the service, having been specially built for icebreaking. The s.s. Princess, which was formerly run by the Charlottetown Steam Navigation Co. on that route, and which was sold to the Marine and Fisheries Department in 1906, is stated in another report as likely to be put on the Charlottetown-Pictou run again this year. It is not expected that the car ferry terminals at Carleton Point and Cape Tormentine will be ready in time to permit of their use by the s.s. Prince Edward Island until early in December next.

On July 31, 1914, the Dominion Government acquired the New Brunswick and Prince Edward Island Ry., from Sackville to Cape Tormentine, and had the car ferry s.s. Prince Edward Island built to run between Cape Tormentine and Carleton Point, P.E.I., near the old open boat landing place at Cape Traverse. A spur line has been built from Carleton Point to the P.E.I.Ry's Emerald Branch and as soon as the steamship terminals are completed at Cape Tormentine and Carleton Point the s.s. Prince Edward Island will commence running between those points. The intention is to widen the P.E.I.Ry. gauge from 3½ ft. to 4 ft. 8½ in. so that there will be no transshipment of freight to and from the Island, as is now necessary owing to the different railway gauges.

There are conflicting reports from Charlottetown as to the management of the steamships to be operated by the Government between Prince Edward Island and the mainland this year. One report stated that G. W. Wakeford, who has been Manager of the Charlottetown Steam Navigation Co. for several years, would manage them, while a later report says he has declined to do so on account of the non suitability of some of the vessels proposed to be employed.

Great Lakes Transit Co. Organized.

The Great Lakes Transit Corporation, organized with a capital of \$20,000,000 by W. J. Connors, of Buffalo, N.Y., has taken possession of the vessels purchased from the New York Central, Pennsylvania, Erie, Rutland and other railways. Among the vessels, which have been engaged in lake traffic, are three passenger steamers, which are said to have cost \$1,000,000 each. The combined capacity of the entire fleet is more than 150,000 tons. The officers elected by the company are: W. J. Connors, Chairman of Board; J. C. Evans, President; M. M. Marcus, First Vice President; H. S. Noble, Second Vice President; W. J. Connors, Jr., Third Vice President; Levi Mayer, General Counsel; R. M. Russell, Secretary-Treasurer. Mr. Connors says the company will begin business at once.

Caution at Rifle Ranges on Lake Ontario.—Owing to the resumption of rifle practice in connection with military training at Long Branch and Niagara on the Lake, the areas likely to be struck by spent or ricochet bullets have been marked as follows:—At Long Branch, 6 miles westerly from the lighthouse at the Toronto west entrance, seven spar buoys have been placed extending southward from the shore for 2,500 yds. from the stop butts. They are painted white and surmounted by a red sign with the words Danger, Rifle Ranges, painted thereon, and mark the extreme limits of the danger zone. At Niagara on the Lake, the danger zone comprises a strip of water at the south shore of Lake Ontario, extending westward for 1½ miles from Fort Massasauga, and 1½ miles northward from the shore. No attempt should be made to cross that area as long as the red flag is hoisted on the rifle ranges at Massasauga and Chatauqua. Any vessel having to pass close to the danger area is cautioned to blow her whistle when at least three miles out so that firing can be stopped until she has passed out of the danger area.

An order in council has been issued approving the regulations and rates to be charged on the ferry between Brockville and Morristown.

Atlantic and Pacific Ocean Marine.

The Donaldson Line s.s. Kastalia, at one time well known in the Canadian trade, has been sold to an English firm for approximately \$90,000.

The Cunard Steamship Co. has declared a dividend of 10% less income tax, on its ordinary capital stock, for 1915, and a bonus of 10% free of income tax.

The Norwegian s.s. Thomas Krag, bound from South Shields, Eng. for Baltimore, Md., was towed to Halifax, Mar. 31, with a broken crank shaft.

Manchester Liners s.s. Manchester Engineer, which was reported sunk by a German submarine, was well known in Montreal, which was her Canadian port during the St. Lawrence season. She was built in 1902.

The Norwegian ship Svaland was towed into Halifax harbor, Apr. 1, by the U.S. revenue cutter Seneca, having been dismasted during a severe storm south of Sable Island. She sailed from Liverpool, Eng., Feb. 29, for New York.

Canada Steamship Lines s.s. Turret Court, when en route to Manchester Eng. at the end of March, put in at St. John's, Nfld., owing to some damage having been sustained to her machinery. The repairs were carried out there, and she proceeded on her voyage.

The British s.s. Potomac, which stranded near the entrance to Halifax harbor recently, was libelled in the Halifax Admiralty Court, Apr. 3, by the Halifax Dry Dock Co. for \$22,000 for temporary repairs made before she sailed for New York.

Reports from Liverpool, Eng., to the effect that the C.P.R. is building three steamships at Hong Kong, China, are denied by the company's officials, who state that they have no knowledge of facilities at that port for shipbuilding on a large scale. It is surmised that the report has arisen from the fact that C.P.R. vessels have been repaired there recently.

Maritime Provinces and Newfoundland.

The West Coast Trading and Steamship Co., St. Georges, Nfld., is reported to have purchased the steam yacht Narwhal, of New London, Conn., for \$25,000, for mail service on St. Georges Bay.

Two Government wharves have been built in Shediac Harbor, N.B., one, 700 ft. long, extending out to low water mark, from the northwest extreme of Shediac Island, and the other at Grandigue, 410 ft. long, towards the north tangent of Shediac Island.

The schooner N. W. White, which wintered in Montreal, and was purchased recently by Eastern Canada Fisheries, Ltd., is reported to have been chartered for a cargo of lumber for Great Britain, at 360s. a standard. The rate before the war was 33s. 6d. a standard.

A. B. Mackay of Hamilton, formerly of R. O. & A. B. Mackay, steamship owners, and who has latterly been dealing in steam and other vessels, has placed an order in Digby, N.S., for the construction of a four masted wooden sailing vessel for the South American trade.

The Shepody Navigation Co., Ltd., Moncton, N.B., is offering its s.s. Wilfred C. for sale. She has been engaged for the last few years in passenger and

freight towage service on the Petitcodiac River. She was built at Yarmouth, N.S., in 1897, and is screw driven by engine of 16 n.h.p. Her dimensions are, length 80 ft., breadth 18.5 ft., depth 8 ft.; tonnage 99 gross, 48 register.

The Marine Department announces that lightship 15, stationed at the Sambro outer bank, at the entrance to Halifax Harbor, will be removed from her station about June 1, for necessary repairs. During her absence, the station will be marked by a combined gas and whistling buoy, painted black, showing an occulting white light, and a submarine bell buoy, painted black, moored 300 yds. northward of the gas and whistling buoy.

The Marine Department advises the old wooden light ship no. 1, at Barrington Bay, on the southwest coast of Nova Scotia, has been replaced by lightship no. 17. The vessel is a wooden schooner with two masts, the hull painted red, and with a red ball on the main mast. The illuminating apparatus is dioptric, consisting of two lights on the fore mast, a white light 35 ft. above water level, and red light 20 ft. below the white light, visible 11 and 6 miles respectively from all points of approach.

The Public Works Department received tenders to Apr. 26, for the purchase of the s.s. Mulgrave and a barge, formerly utilized in transferring passengers and freight at the Strait of Canso, between Mulgrave and Point Tupper, N.S. The Mulgrave was built at New Glasgow, N.S., in 1893, and is of steel, and is screw driven by engine of 75 n.h.p. Her dimensions are, length 114.8 ft., breadth 31 ft., depth 16.4 ft.; tonnage, 485 gross, 330 register. The barge is 140 ft. long, 31 ft. broad and the hold is 6 ft. deep, and about 195 tons.

Province of Quebec Marine.

The s.s. Westmount, formerly owned by the Montreal Transportation Co., has had her name changed to Wethersfield.

Canada Steamship Lines s.s. Laurentian sailed from Quebec, Apr. 15, for Natashquan and Anticosti, being the first steamship to sail out of Quebec this year.

The Public Works Department has completed the dredging of a basin on the east side of the Government wharf at Murray Bay, to 15 ft. below low water level.

The Quebec Harbor Commissioners received tenders to Apr. 15, for the construction of a freight shed and grain loading galleries on the northern extension of the Princess Louise embankment.

The Montreal Board of Control has recommended that the contract for the operation of a ferry service between Montreal and St. Helens Island, be awarded to Canada Steamship Lines, Ltd., for one year for \$22,180, and if the council possesses the necessary power, to extend the contract to five years at \$19,950 a year.

The operation of the ferry between Riviere Ouelle and Ste. Irene and Murray Bay, came before the Senate recently, when Senator Lougheed stated that the cost of the service from July 1, 1913, to Mar. 1, 1916, was \$143,836.08, and that several complaints as to the service during the winter had been received. In the winter of 1913-14, the vessel was withdrawn from service Dec. 27, resuming Mar. 20; in 1914-15, she missed 30 regular trips, and in 1915-16, she missed 47 regular trips.

Steamer Howard W., Ltd., Steamer Stuart W., Ltd., and Steamer Richard W., Ltd., have been incorporated under the Quebec Companies Act, each with authorized capital of \$10,000, and offices at Quebec, Que., to own and operate steam and other vessels, docks, wharves and other facilities, to dock and repair vessels, operate salvage and wrecking plants, act as stevedores and general merchants. L. C. Webster, H. Aird, Montreal, and W. Q. Stobo, H. C. Thorn and C. St. J. Griffis, Quebec, are the incorporators in each case.

Ontario and the Great Lakes.

The Welland Canal was officially opened for traffic, Apr. 22, at 8 a.m.

The Public Works Department will receive tenders to May 2, for dredging to be done at Port Hope.

The Western Navigation Co.'s s.s. Kaministiquia, reported sold recently, has had her name changed to Westoil.

Canada Steamship Lines' s.s. Rosedale has been generally rebuilt for ocean service, at Port Arthur, at a cost of approximately \$50,000.

Hamilton press reports state that Canada Steamship Lines is making arrangements for taking over the Hamilton Ferry Co's business.

The C.P.R. opened its service on the Great Lakes, Apr. 24, and will give five sailings each week during the summer from Port McNicoll.

The s.s. Quinte Queen, which was offered for sale by auction at Ottawa, Mar. 28, as mentioned in our last issue, was not sold, owing to lack of bids.

The Farrar Transportation Co.'s s.s. Collingwood ran aground above Whitefish Point, Apr. 24, in ice, during a fog, and was released by dredging, Apr. 25.

The Reid Wrecking Co., Sarnia, is reported to have sold the s.s. Magnetic to Cleveland, Ohio, parties, and to be negotiating for the sale of the s.s. Wyoming.

The Great Lakes Transportation Co.'s s.s. Glenlyon was the first steamship to pass through the Sault Canals, down-bound, locking during the afternoon of Apr. 23.

Work in connection with the raising of the Cadillac Steamship Co.'s s.s. Western Star, which foundered near Sarnia, last autumn, has been suspended for a time owing to the collapse of the cofferdam which had been built around it. The loss is estimated at \$32,000.

Canada Steamship Lines s.s. Rochester, which last year was chartered to a company operating out of Chicago, will this year be operated by the Northern Navigation Co., which is subsidiary to Canada Steamship Lines Ltd., in place of the s.s. Majestic, destroyed by fire recently.

The Buffalo Creek Rd., a switching road of 34.95 miles, in Buffalo, N.Y., is reported to have awarded a contract to the Great Lakes Dredge and Dock Co., there, for a new dock to be built on the canal, to be of reinforced concrete on pile foundation, about 800 ft. long and 30 ft. wide.

The Interstate Commerce Commission decided, Apr. 6, to reconsider its demand of the G.T.R. application under the Panama Canal Act, to retain control of the Canada Atlantic Transit Co., operating steamships between Georgian Bay ports in Canada, and Chicago, Ill., and Milwaukee, Wis.

A press report from Cleveland, Ohio, states that 26 steamships have been ordered there for delivery during 1916 and 1917. Of these, 9 are intended for the lake trade and the remainder for ocean service. The 17 ocean vessels, it is stated, will be delivered this year, with 6 of the lake vessels.

The Niagara, St. Catharines and Toronto Navigation Co's s.s. Dalhousie City was the first steamship to enter Toronto harbor from an outside port this year, arriving there Apr. 1. Capt. Maddick was presented with a silk hat by the harbor master. This is the third successive year that the Dalhousie City has opened the season at Toronto.

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater for March as follows:—Superior, 602.17; Michigan and Huron, 579.48; Erie, 571.74; Ontario, 245.46. Compared with the average March levels for the past ten years, Superior was 0.60 ft. above; Michigan and Huron, 0.57 ft. below; Erie, 0.07 ft. above, and Ontario, 0.43 ft. below.

The Public Works Department has dredged a channel 150 ft. wide leading to the Government wharf at Bruce Mines, to a depth of 16 ft. below zero of the gauge, which is 580 ft. above mean sea level at New York. At the wharf, a turning basin has been dredged to the same depth, for 150 ft. east and 200 ft. west of the middle of the wharf, and for 190 ft. behind the outer point of the wharf.

Canada Steamship Lines, Ltd., has deposited with the Minister of Public Works, the plans of a proposed wharf to be built in the St. Lawrence River at the foot of Wolfe Island. As announced in our last issue, it is the company's intention to build a wharf at Port Metcalfe, at the foot of Wolfe Island, for the transfer of passengers for Clayton and other Thousand Island points from the steamships Toronto and Kingston.

The s.s. Cabotia, formerly owned by the Cabotia Steamship Co., Montreal was offered for sale at Toronto, by public auction recently. She was built at Gibraltar, Mich., in 1880, and was formerly known as Hiawatha. She is of wood with diagonal strapping on frames, with steel boiler house, and equipped with fore and aft compound engines with cylinders 21 and 50 ins. diam., by 46 ins. stroke, 700 i.h.p. at 85 r.p.m., and supplied with steam by a Scotch boiler 12 x 12½ ft. at 125 lbs. Her dimensions are: length 234 ft., breadth 36 ft., depth 30 ft.; tonnage 1,530 gross, 932 register.

An examination of the dredged channel at Owen Sound, by the Public Works Department recently, shows that there is a least depth of 20 ft. in the channel from the outside bay to a point 200 ft. inside the back range lighthouse, with the exception of an area 100 ft. wide on the east side extending from 550 ft. outside to 350 ft. inside the front range lighthouse, where depths of 19 ft. and less are found. From a point 200 ft. inside the back range lighthouse to the outer end of the new Government wharf there are several spots with a less depth than 20 ft. and a least depth of 17.7 ft.

Two steel freight steamships are under construction by the Western Dry Dock & Ship Building Co., at Port Arthur, for delivery during the current year. Their dimensions are, length over all, 261 ft., length between perpendiculars 251 ft., beam 43½ ft., depth 28 ft. 2 ins. Each vessel will be equipped with triple expansion engines with cylinders 20, 33 and 54 ins. diam. by 40 ins. stroke, supplied with

steam by two Scotch boilers 14½ ft. diam. by 11 ft. long at 190 lbs. They are being built to Lloyd's inspection for ocean service, and will each have a carrying capacity of 3,000 gross tons.

The s.s. Frontier, formerly Argyle, and at one time owned by the People's Steamboat Co., Toronto, is to be sold unless claims against her for repairs, etc., are met, according to the decision of the Admiralty Court, held at Chatham, Ont. Among the numerous claims is one of the Customs Department for duty on repairs made to her last year at Detroit, Mich. The vessel has had an unsuccessful and varied career. She was built at Picton, Ont., in 1876, and rebuilt in 1899. The hull is of oak, and her dimensions are: length 185 ft. 1 in., breadth 26 ft., depth 9 ft. 7 ins.; tonnage, 700 gross, 374 register.

A Montreal press dispatch stated recently that in anticipation of a shortage of vessels in the lake trade this year, Canada Steamship Lines, Ltd., was reported to have bought up every freighter it was possible to acquire suitable for lake service, and that several vessels hitherto plying out of Ogdensburg had been taken over together with several vessels which were not in service last year. We are officially advised that Canada Steamship Lines, Ltd., has purchased the s.s. Moreland, which was wrecked on Lake Superior two or three years ago, and which is now being repaired at Superior, Wis.

The Toronto Harbor Commission contemplates continuing reclamation work along the waterfront, between the Humber River and Bathurst St., and on Toronto Island. The harbor head walls are also under contemplation, from Bathurst St. east, for which work tenders are being asked. In addition to this, reclamation work will be proceeded with in the industrial district and inner harbor, and the Cherry St. bridge. The total cost of the work west of Bathurst St. and at Toronto Island, which it is expected will be commenced this year, approximates \$500,000, while the other work mentioned will be about \$700,000.

The George Hall Coal Co., Ogdensburg, N.Y., has sold its s.s. Henry B. Hall to A. H. Lonov, Montreal. She was built at Detroit, Mich. in 1881, and is of oak construction with diagonal strapping on frames, with bow sheathed for ice, and was practically rebuilt in 1906, when she received her present name, having formerly been known as Iron Duke. She is equipped with compound engines with cylinders 23½ and 48 ins. diam., by 36 ins. stroke, 415 i.h.p. at 82 r.p.m., and supplied with steam by a Scotch boiler 13 ft. 4 ins. diam. by 11 ft. 7 ins. long, at 150 lbs. Her dimensions are, length 213 ft., breadth 35 ft., depth 19 ft.; tonnage, 1,151 gross, 962 register.

The s.s. T. J. Waffle, formerly owned by T. J. and W. J. Waffle, Kingston, Ont., was offered for sale, by auction, Apr. 12, at Kingston, by order of the Exchequer Court of Canada, Toronto Admiralty District. She is of oak construction and was built at Westport, Ont. in 1914. She is equipped with a high pressure engine with cylinder 12 ins. diam. by 14 ins. stroke, built at Kingston in 1879 and remodelled in 1914, and supplied with steam by a boiler of the firebox type, 4 ft. 8 ins. diam. by 8 ft. long, at 150 lbs. Her dimensions are, length 105 ft., breadth 22 ft. 5 ins., depth 8 ft.; tonnage, 202 gross, 104 register. The vessel was purchased by Capt. A. Foster, Smiths Falls, Ont., for \$8,500.

The Great Lakes Transit Co. has been organized in New York, with a capital of \$20,000,000, to control 85% of the passenger, packet freight and grain steamships operating on the Great Lakes under the U.S. flag. The fleet will comprise 35 steamships with a freight capacity of 150,000 tons, these being the vessels of 6 railway companies compelled to relinquish their connection with the operation of steamships under a section of the Panama Canal act. The vessels include those controlled by the Pennsylvania, New York Central, Erie, Delaware & Lackawanna and Rutland Rds. J. C. Evans, heretofore Vice President and General Manager, Anchor Line, has been appointed President of the new Company, with office at Buffalo, N.Y.

The s.s. Sarnor, latterly owned by H. M. Norris, Montreal, and which has been the arrow signal which was used last year with claims aggregating \$21,000 against her, was sold by order of the Admiralty Court, Apr. 1, to A. B. Mackay, Hamilton, and P. C. Bonham, Toronto, for \$6,700, the completion of the sale being subject to the consent of the Admiralty Court. The Sarnor was built at West Bay City, Mich., in 1888, and rebuilt in 1901, and was formerly known as Britannic. The hull is of oak with diagonal strapping on the frames, and with the bow sheathed for ice, steel arches and steel boiler house. The propelling machinery consists of fore and aft compound engines with cylinders 24 and 48 ins. diam. by 40 ins. stroke, 495 i.h.p. at 82 r.p.m., and is supplied with steam by a boiler of the firebox type, 10½ by 15½ ft. at 115 lbs. Her dimensions are: length 219 ft., breadth 36 ft., depth 20 ft.; tonnage 1,319 gross, 1,152 register. She was used in the coal trade between Lake Erie ports and Montreal.

The officer in charge of the operation of the canals and locks at Sault Ste. Marie, Mich., announces that to replace the arrow signal which was used last year to designate the lock to be taken by upbound vessels in passing through the Sault Canals, there has been installed on the top of the watchman's shelter near the end of the centre pier, a signal composed of two inclined arms which diverge upward in the form of a broad V. The arms each carry four white lights, spaced in line equidistantly, and are lighted either on the arm to the north or the south to signal that the lock on the side so indicated is to be taken by an upbound vessel. In order that downbound vessels may know before coming within calling distance of the west centre pier whether there is sufficient water to enable them to take the Poe lock, the draft of the Poe lock will be displayed at the watch station at the west end of the west centre pier, in a manner similar to that at Brush Point, and will be properly lighted so that it may be read at night.

British Columbia and Pacific Coast.

The British Columbia Express Co., will not, we are advised, operate any steamboats during this year.

The Public Works Department received tenders recently for the construction of a wooden freight shed on the Government wharf at Vancouver.

The West Vancouver ferries' total receipts for March were \$1,573.10, and the deficit \$197.01. They are being taken over by the council for operation on May 1.

The C.P.R. s.s. Princess Victoria was taken out of service early in April for her

annual overhaul, being replaced on the Seattle run by the Princess Alice, and on the Vancouver run by the Princess Adelaide.

The Marine Department has given notice that the change in the color of gas beacon lights and gas buoy lights, from occulting red to occulting white, in British Columbia waters, will be made as occasion offers, about May 1.

The Marine Department has discontinued the use of dolphins to mark the channel at the entrance to the north arm of the Fraser River, as the building of a jetty on the south side has made them unnecessary.

The C.P.R. sailings to Alaska will commence with the s.s. Princess Alice, June 9, and she will make eight trips during the summer. The s.s. Princess Charlotte will make three trips in July, and the s.s. Princess Sophia, two in each month, June, July and August.

The West Vancouver Ferry Co. will probably increase its ferry service May 1, operating three vessels, the Doncella, Sonrisa and West Vancouver No. 5. The last mentioned has been operating under charter on a passenger service between Vancouver and Port Moody.

The British Columbia Premier stated in the Legislature, Apr. 3, that the Agent General of the Province in London, Eng., was doing excellent work in connection with the releasing of interned German vessels, with the view of utilizing them in the Pacific coast lumber trade.

The wharf at Blubber Bay, Texada Island, has been extended to 260 ft. long, and has an elevated car track on it near to its eastern extremity. A berth has been dredged giving depths from 25 to 20 ft. along the north face, and from 20 to 15 ft. along the northwest face.

The Dominion Government lighthouse and buoy tender Quadra, which was sunk at Gallows Point, near Nanaimo, Feb. 26, in collision with the C.P.R. s.s. Charmer, is reported sold as she lies, partially submerged at low tide, to Capt. A. R. Bissett, Vancouver. It is stated that she will be raised and repaired if possible.

The C.P.R. commenced its summer service to the west coast of Vancouver Island, Apr. 1, when the s.s. Tees sailed from Victoria for Clayoquot and way ports. The summer schedule provides for similar trips on the 1st and 15th of each month, and to Holberg and way ports on the 7th and 20th of each month, making four trips each month.

Repairs on the Union Steamship Co's s.s. Camosun were expected to be completed by the end of April. The contract was placed with Yarrows Ltd., Esquimalt, the price being stated as \$18,669. The contract covered the renewal of 19 plates, 8 plates to be taken out and faired, repairing 3 tank top plates, repairing the stokehold bulkhead, renewing the keel for about 60 ft., new propeller and tail shaft and overhauling the engines. The Camosun stranded on a reef off Digby Island, Mar. 7, and was released about 10 days later.

The Grand Trunk Pacific Coast Steamship Co.'s summer schedule goes into effect, from Seattle, Wash., June 12, and from Prince Rupert, June 17. The steamships Prince George and Chelohsin, the latter owned by the Union Steamship Co. of British Columbia, will be operated between Seattle, Victoria, Vancouver and Prince Rupert, and the s.s. Prince Rupert from Seattle to Skagway, Alaska, calling at principal ports each way. The first vessel for the season left Prince Rupert

for Skagway, Mar. 30, and will continue until Sept. 25 from Seattle and Sept. 27 from Prince Rupert.

Port Moody, B.C., ratepayers, on Apr. 8, by a vote of 115 to 15, endorsed the agreement between the city and Boyds, Limited, which has been formed to carry on a general shipbuilding and repairing business. It was announced that construction would be proceeded with immediately, and by about the middle of July, it is expected that the plant will be sufficiently advanced to enable the first keel to be laid, and four months thereafter, it is anticipated that the first launch will take place. The site of the plant is on

the water front between Kyle and Queen Sts., about 400 by 1,100 ft. Foundations are to be laid for three launching slips, and vessels of approximately 2,000 tons will be built, each with capacity for 1,500,000 ft. of lumber. The slips will be built so as to provide for the building of steel vessels up to 10,000 tons. Two marine railways are also to be included in the plant, one of 1,000 tons capacity and the other of 3,000 tons. The active management is in the hands of Capt. H. Mowatt, formerly Marine Superintendent, C.P.R., Liverpool, England, who has superintended the construction of several of the largest of the C.P.R. steamships.

1911, to Mar., 1916, Assistant Traffic Manager, same road, St. Paul, Minn.

P. D. Sutherland, whose appointment as General Agent, Passenger Department, Canadian Pacific Ocean Services, Ltd., Hong Kong, China, was announced in a previous issue, was born at Toronto, Nov. 2, 1879, and entered C.P.R. service in the General Freight Department, under his father, J. N. Sutherland, subsequently transferring to the Passenger Department at St. John, N.B., where he spent four years in the City Ticket Office, and the West. St. John Atlantic Terminal, and was then transferred to Toronto as chief clerk in City Passenger and Ticket Agent's office, and in 1906 was transferred to Hong Kong as Passenger Agent, C.P.R. Pacific Ocean Service. His territory now covers Hong Kong, South China, Philippine Islands, Straits Settlements and India.

C. E. Croft, whose appointment as Chief of the Commissary Department, Canada Steamship Lines, Ltd., Toronto, was announced in our last issue, was born at Cobourg, Ont., Aug. 26, 1904, and entered steamship service in Apr. 1904, since when he has been, to 1907, stenographer, Passenger Department, Richelieu & Ontario Navigation Co., Montreal; 1907 to 1911, secretary to Traffic Manager, same company, Montreal; 1911 to 1913, chief clerk, Traffic Department, Montreal; 1913 to 1914, chief clerk to Manager, Eastern Lines, same company, Montreal; 1914 to 1915, chief clerk to Operating Superintendent, Canada Steamship Lines, Ltd., Montreal; 1915 to March 1916, General Agent, same company, Toronto.

Requisitioning of Vessels by the Admiralty.—The Minister of Trade and Commerce has issued a circular stating that there is a general impression that vessels carrying Canadian grain from Canadian ports are more likely to be requisitioned by the Admiralty than are those carrying Canadian grain from U.S. ports. He points out that British vessels sailing from U.S. ports are in exactly the same position regarding their requisition as those sailing from Canadian ports. He also states that so far as can be seen at present, no necessity will arise during the current season for the Dominion Government to commandeer grain for war purposes, as the desired reserve for immediate use was secured by its action last November.

Enemy Subjects on Vessels at Canadian Lake Ports.—On a report emanating from Cleveland, Ohio, to the effect that the Dominion Government had decided to remove sailors of enemy nations from all vessels touching at Canadian lake ports, it was announced in Ottawa, Apr. 21, that the Government did not contemplate examining vessels touching at Canadian lake ports, and removing sailors of beligerent nations.

The Dominion Government Dredge, Port Nelson, which was built at Polson Iron Works, Toronto, and taken to Port Nelson, Hudson Bay, in 1913, has, according to a statement in the House of Commons, by the acting Minister of Railways and Canals, cost to date, \$363,518. Since being sent north, the dredge was working for nine weeks during the summer of 1915.

North American Shipping Co. Ltd. has been incorporated under the Dominion Companies Act, with \$48,000 authorized capital and office at Winnipeg, to own and operate steam and other vessels, docks, wharves and other shipping facilities, and to act as general carriers.

Mainly About Marine People.

J. W. Norcross, Vice President and Managing Director, Canada Steamship Lines, Ltd., has been elected a director of Canadian Vickers, Ltd., Montreal.

John Hannan, head of the Ogdensburg Coal & Towing Co., and President, St. Lawrence Realty Co., Montreal, died at Ogdensburg, N.Y., Apr. 9, after a long illness.

Lt.-Col. G. P. Murphy, of the Canadian Army Service Corps, and Vice President, Ottawa Transportation Co., who has been in England for some time is on the staff of Major General Carson, C.B., the Minister of Militia's representative in London.

Gilbert Johnston, who has been appointed Consulting Engineer, Canada Steamship Lines, Ltd., Montreal, was appointed Mechanical Superintendent, Richelieu & Ontario Navigation Co., in Sept. 1894, and continued in that capacity under the various changes made in the company, until his present appointment.

Capt. J. Freeman, who died at Victoria, B.C., Apr. 2, aged 81, had been master of various vessels on the Atlantic and Pacific Oceans for many years, having received his first command in 1856. For the past 15 years he was port captain for R. Duns-muir & Sons, but owing to failing health, his duties had been purely nominal for the last three years.

Capt. McNeill, of the Canadian Pacific Ocean Services s.s. Lake Manitoba, committed suicide at Plymouth, England, by shooting, Apr. 7. He had been in C.P.R. service from the time when the company took over the Beaver Line, prior to which he was with Elder, Dempster & Co., who controlled the Beaver Line. He was about 45 years old.

Lieutenant J. M. Hazen, son of Hon. J. D. Hazen, Minister of Marine, has died of wounds received in action. He graduated from the Royal Military College, Kingston, Ont., since the commencement of the war, and received a commission as Lieutenant in the 25th Artillery of Artillery, C.F.A.

Claude Cameron Bonter, who has been appointed General Baggage Agent, Canada Steamship Lines, Ltd., Montreal, was born at Toronto, Nov. 13, 1884, and entered navigation service in 1905, since when he has been, to 1910, baggage agent, Richelieu & Ontario Navigation Co., Toronto; 1911 to 1912, Assistant Baggage and Claims Agent, same company, Montreal; 1913 to 1915, Special Agent, Passenger Traffic Department, Canada Steamship Lines, Ltd., Montreal.

A. Ray Lawrence, who has been appointed District Passenger Agent, Northern Navigation Co., Cleveland, Ohio, is a member of the firm of Akers, Folkman & Lawrence, General Steamship and Pas-

senger Agents, and has been connected with the transportation business since 1902. He began as messenger, Cleveland, Cincinnati, Chicago & St. Louis Ry., Cleveland, remaining in that company's service until 1905, when he was appointed assistant ticket agent, New York, Chicago & St. Louis Rd., and later joined Akers & Folkman, general transportation agents, becoming a partner in 1914.

Engineer-Commander J. Carmichael, R.N.R., who was personally decorated by the King, with the D.S.O., recently, for special services in mine laying operations, was in C.P.R. service from 1911, when he went from Liverpool to Vancouver, to occupy a shore position in the British Columbia Coast Service. At the outbreak of war he was in Scotland superintending the construction of two vessels for the C.P.R., the Princess Irene and Princess Margaret, both of which were requisitioned by the Admiralty as soon as completed. He was on the Princess Irene for some time and was transferred to the Princess Margaret just prior to the sinking of the former.

Capt. W. F. Butler, who was drowned following the torpedoing of the s.s. Port Dalhousie in British waters, as announced in our last issue, lived in Halifax, N.S., and was connected with deep sea navigation for many years. He was for some time serving with Pickford and Black, and was chief officer of the s.s. Beta, and later, master of the s.s. Fastnet, sailing her from Halifax to British Columbia via the Straits of Magellan. On returning to Halifax, he was appointed master of the s.s. Oruro, and on leaving Pickford and Black's service, had command of the Arctic schooner Burleigh, the schooner Adventure, the s.s. Sable I, and later took the s.s. Wasie to England where she was sold.

H. A. Jackson, who has been appointed General Traffic Manager, Great Northern Pacific Steamship Co., San Francisco, Ca., was born at Toronto, Jan. 6, 1869, and educated at Upper Canada College. He entered railway service in 1894 as Travelling Freight Agent, G.N.R., Duluth, Minn., and was from July 12 to Dec. 1, 1896, Contracting Freight Agent, same road, Spokane, Wash.; Dec. 1, 1896, to Aug. 21, 1898, Travelling Freight Agent, same road, Spokane, Wash.; Aug. 21, 1898, to June 13, 1899, General Agent, same road, Spokane, Wash.; June 13, 1899, to Oct. 1, 1905, Commercial Agent, same road, and General Freight and Passenger Agent, Spokane Falls & Northern Ry., Spokane, Wash.; Oct. 1, 1905, to Aug., 1909, Assistant General Freight and Passenger Agent, G.N.R., St. Helena, Mont.; Aug., 1909, to Apr., 1911, in a similar position, Portland, Ore.; Apr.,

Stranding of the s.s. Potomac.

An investigation was held, recently, at Halifax, N.S., into the causes of the stranding of the Anglo-American Oil Co's s.s. Potomac, near Holy Stone rock, south of Sandwich Point, at the entrance to Halifax harbor, Feb. 19. Capt. L. A. Demers, Dominion Wreck Commissioner, conducted the enquiry, assisted by Capt. John Fleming and D. C. Stuart, as nautical assessors. The Potomac is 3,868 tons gross, 2,471 tons register. She sailed from Middlesbrough, Eng., Jan. 29, for Galveston, via Norfolk. On the voyage out, boisterous weather with head wind was encountered, and there was considerable fog in the neighborhood of Halifax harbor, where she grounded, remaining fast until Feb. 23.

Following is a summary of the judgment: The court cannot come to any other conclusion than that the master allowed but one thought to occupy his mind, viz., that of bringing his vessel to port as quickly as possible, owing to shortage of fuel, and ignoring prudence, by proceeding without a pilot, on the distance obtained from Chebucto by sound only, and by being too positive of the correctness of a compass which had scarcely been checked during the outward voyage. Being a stranger in the vicinity, he showed lack of judgment in attempting to make a strange port under such adverse conditions as existed. The fact that, through stress of weather, his coal ran short, causes the court to deal leniently with him, by severely censuring him for his temerity and lack of prudence and judgment.

The court's attention was called to the system of having sailing vessels instead of steamboats to convey pilots to and from vessels, and while admitting that criticism is justified, points out that in cases where a vessel chooses to keep going instead of laying to, the adoption of steamboats would be of little use. The evidence does not show that the vessel's officers failed in their duties, and they are exonerated. The logs and deviation book were all kept with a degree of care and precision. The court deprecates the placing of boys, with practically no sea experience, on the lookout, as they are incapable of realizing the importance of their duties, but understanding the difficulties of masters in finding crews, owing to war conditions, refrains from further criticism of the master's actions on this head.

Certificated Officers on Motor Vessels.

The bill before the House of Commons regarding the necessity of certificated officers for the navigation of vessels driven by internal combustion engines, of which mention was made in our last issue, amends sec. 629 of the Canada Shipping Act, and a new section, 640a is added regarding certificates and classification of engines on such vessels. Sec. 629 provides that no person shall act in the double capacity of engineer and master on any steamboat, and no person shall, except when the boiler is fired from the engine room, act as engineer and fireman on any steamboat having an engine of over 7 n.h.p. and required by law to carry a certificated engineer. This is amended by the addition of a sub-section reading as follows: "Subject to such regulations as may be made by the Minister this section shall not apply to any passenger ship not exceeding 65 ft. reg-

istered length propelled by an internal combustion engine or by a steam engine with a flash boiler, or by electricity."

Sec. 640a, which is added, is as follows: "The Minister may issue certificates authorizing persons found qualified by the Chairman of the Board of Steamboat Inspection to take charge of the machinery of vessels propelled by internal combustion engines only, and may prescribe by regulations, a classification for such certificates, the qualifications necessary for obtaining the several classes respectively, the limits and authority of the power conferred by the several classes of certificates and the fees payable for such certificates, and may also provide for the examination of those desiring to obtain certificates. 2, The provisions of sec. 628 shall apply to the certificates granted under this section."

Sec. 628 provides for the suspension and cancellation of certificates.

The Quadra-Charmer Collision.

Following is a summary of the judgment on the causes of the collision between the Dominion Government s.s. Quadra and the C.P.R. s.s. Charmer, near the entrance to Nanaimo harbor, B.C., Feb. 26, when the former was sunk. The enquiry was held by Capt. J. D. Macpherson, Wreck Commissioner for British Columbia, assisted by Capt. Ridley and Gardner as nautical assessors. The court decided that the whole blame for the collision was due to E. LeBlanc, master of the Quadra, the mishap taking place in broad daylight with a smooth sea and fine clear weather. The Quadra had the Charmer broad on her own starboard and was therefore the giving way ship, but no action was taken until too attempting to cross the Charmer's bow, late. The master disobeyed article 22 by with the inevitable result. Further, article 25 requires all vessels in narrow channels to keep on their own starboard side of the channel, but the Quadra was so far on the port side that the evidence of her own crew placed her about 40 ft. off the black buoy which marks the port side of the entrance to Nanaimo harbor. Much evidence, most of which was unreliable and conflicting, was given to the effect that the Quadra gave two short blasts of her whistle on seeing the Charmer. Granted that such whistles were given, such a signal was in violation of article 28 which indicates other signals. The one mentioned if given indicated that the Quadra was directing her course to port, which she never did, and had she done so the court's opinion was that such a movement was neither authorized nor required by the regulations under the circumstances existing.

The court decided not to deal with the master's certificate, but severely reprimanded him, being influenced by the facts that there was no loss of life, that although the collision was caused by the most flagrant breaches of the regulations, it was, in the court's opinion, not due to ignorance nor to carelessness, but rather to the stupid assumption which is far too prevalent in British Columbia, that by being the first to blow a signal whistle gives that vessel the right to choose on which side she will pass an approaching vessel; and that the loss of his vessel as affecting his previous excellent record is in itself a severe punishment. In reprimanding him, the court warned him as well as others handling vessels in British Columbia waters, that until any duly authorized rules appear, the present international rules must be implicitly

obeyed and that in future any breach of them will be severely dealt with. No blame was attached to any other members of the Quadra's crew. Regarding the Charmer, the court found it difficult to see how any blame could be imputed to its officers or crew. It was the duty of the Charmer's master to carry out the one rule which applied to him under the conditions then existing, viz., to keep her course and speed. This he undoubtedly did, and furthermore when he found that a collision was unavoidable, he took the best action possible to avert it. The master of the Charmer, C. Campbell, and the officers and crew were therefore absolved from all blame for the casualty. Capt. Gardner dissented from the judgment as given, giving as his reasons that the Charmer had left her berth on the outward trip at full speed, which is dangerous and should be condemned; that there was some excitement on board the Charmer, caused by nearly swamping a motor launch in passing her in contravention of the regulations governing such cases, this excitement causing a lack of proper vigilance and causing the approach and the signals of the Quadra to be overlooked; that the signals of the Quadra were properly given, and while they are not international signals are the outcome of a custom and long usage and recognized by local masters. He also stated that the master of the Quadra could not be absolved for being on the wrong side of the channel, by being there he was contributing to the initial cause of the accident and merited the censure which a departure from the rules deserves. It was announced after the judgment had been delivered, that the master of the Quadra would appeal to the Minister of Marine against the judgment, as in his counsel's opinion the finding was opposed to the trend of the evidence.

Licensing of Canadian Vessels for Foreign Business.

Following on the British regulations of Nov. 10, 1915, prohibiting British vessels of 500 tons and upward from engaging on voyages to foreign ports without licenses, the Dominion Government has issued instructions on similar lines, as follows: All Canadian registered vessels whose gross tonnage exceeds 500 tons, are from Apr. 1, prohibited from proceeding on any voyages, excepting those from a port in Canada to another port in Canada, or from a port in Canada to a port in the United States, and vice versa, unless a license to do so has been granted to, or in favor of, the owners or charterers of such steamships. The Minister of Marine is authorized to appoint a committee with power to grant the licenses required, which may be general in reference to classes of ships or their voyages, or special. The Minister is authorized from time to time, to add to the committee and to substitute as members, others, to replace such as may die, resign or become incapable of acting. It is also ordered that all steamships failing or refusing to obtain a license as provided, shall be subject to forfeiture.

Tonnage on Canadian Register.—The Minister of Marine in replying to a question in the House of Commons recently, stated that the tonnage on the Canadian register for the decennial periods from 1875, was as follows: 1875, 1,205,565; 1885, 1,231,856; 1895, 825,776; 1905, 669,825; 1915, 929,891.

Investigation of the Fire on the s.s. Matatua.

An enquiry was held at St. John, N.B., concluding Apr. 4, into the origin of a fire aboard the s.s. Matatua, Mar. 12 and 13, while lying at her dock there, whereby the master, Capt. Gilman, lost his life. Capt. L. A. Demers, Dominion Wreck Commissioner, presided, assisted by Capt. A. J. Mulcahy and D. Kenny, as nautical assessors. The vessel is owned by Shaw, Savill & Albion Co., London, Eng., and was loading miscellaneous cargo for Australia and New Zealand, including 3,000 to 4,000 drums of calcium carbide, which was stowed in every hold.

The first officer stated that an alarm of fire was conveyed to him at 12.10 a.m. on Mar. 12, and immediate instructions were given to combat it. The ship's hose was not used, as the water service pipe on deck was under repair, but the crew helped the crew of the Sin Mac, the tug and fireboat, which was fast alongside the Matatua, and hose was playing on the fire by the time the local brigade arrived. He caused the hatches to be battened down and directed the use of carbon dioxide into hold 3. Notices prohibiting smoking were exhibited at various points and were visible to all, and there were two watchmen, one at the gangway and the other the ship's watchman, who were instructed to perform the usual duties and also to see that no one smoked in the hold. He stated that though he was not familiar with local climatic conditions, precautions were taken to prevent the service pipe from freezing, but without avail, and it was being repaired for the second time. Regarding the explosions, he stated that a few minutes after the first one he spoke to the captain as to the dangers, and had hardly left the bridge when the second one took place, causing a general outburst of flame and eventually causing the captain's death.

D. Gallagher, an employee of the Marine Department, gave evidence on the effects and dangers of calcium carbide, and on precautions in handling it, and termed the gas generated as very penetrating and that it would explode of its own heat. A representative of the Canadian Carbide Co. also spoke as to the method of packing and handling carbide, and stated that he considered carbide was not an explosive.

After considering the evidence, and after having visited the vessel, the court criticized the second officer for not being on deck at 12 midnight, when his watch commenced, instead of being in his room, and also on the manner and matter of his evidence, but it was informed later that at the time he was not in his ordinary senses, but was in an abnormal condition, and had this been known at the outset, the taking of any evidence from him would have been deferred. The court failed to find that anyone had been smoking in hold 2, specially mentioned. Regarding the origin of the fire, the court found that there were several possibilities, but no certainty, and therefore declared that the origin was unknown and remains a mystery. In referring to the second explosion, the evidence showed that apparently the fire had been put out late on the first day, and the second explosion occurred early on the second day, enveloping the vessel in flame and cutting off the captain's quarters with remarkable suddenness. The opinion of the court as to the second outbreak is that the explosion was caused through the accumulation of acetylene in a restricted space, generated by the immersion of the carbide in

water, and that the igniting of the gas took the merest fraction of a second, as it cannot conceive that any fire remained from the first outbreak after the immersion of the hold. The court criticizes the lack of foresight in the stowing of such a cargo, quoted a British Board of Trade regulation respecting the carriage of carbide, and stated that in face of such a regulation it cannot for a moment condone the method adopted on the Matatua. The court was however unanimous in exonerating the officers of the vessel from any blame for the casualty, but advised a stricter supervision at all times, while cargoes are being taken in, and more especially during war times. It also recommended that if the service pipe be out of repair, means be immediately adopted to replace temporarily the defective service, as at no time should a vessel be left without proper fire equipment. In reiterating that the origin of the fire is unknown, the court stated that it may have been caused by spontaneous combustion, the dropping of a cigarette stub or the hot ashes of a pipe, either accidentally, carelessly or maliciously, but there are no signs visible, nor is there any evidence even to suspect the employment of chemicals or bombs. The death of the master was accidental and no blame was attached to anyone for the loss of life.

The Longshoremen's Agreement at Montreal.

The longshoremen attached to the port of Montreal have entered into an agreement with the shipowners trading to the port, for two years from Mar. 15, providing for an increase of 5c an hour day and night on general cargo, and 5c an hour increase to coal shovellers on general cargo vessels. The rates heretofore in force were 35c an hour for day and 40c an hour for night work on general cargo, and 40c an hour for coal shovellers day and night. All other conditions remain as heretofore. This is the first time the longshoremen at Montreal have had increases since 1908.

During the negotiations, the most friendly spirit existed between all parties, and it was through this good will that a speedy and satisfactory arrangement was concluded. The steamship lines which are parties to the agreement are:—Allan Line, Black Diamond Line, Cairn Line, Canadian Northern Steamships, Ltd., Canadian Pacific Ocean Services, Ltd., Crown Line, Cunard Line, Direct Line, Donaldson Line, Furness Line, Head Line, Leyland Line, Manchester Liners, Ltd., New Zealand Shipping Co., Ltd., South African Line, Thomson Line and White Star-Dominion Line.

Vessel Losses during the War.

Merchant vessel losses from the commencement of the war to Mar. 23, are reported as totalling 726 with an aggregate tonnage of 1,987,375. Of these, 627 vessels of 1,914,375 tons are steamships, and 99 vessels of 73,000 tons are sailing ships. The losses of the allied powers were 481 steamships of 1,621,000 tons, and 57 sailing vessels of 47,000 tons; while neutral nations lost 146 steamships of 293,375 tons, and 42 sailing vessels of 26,000 tons. The chief losses were naturally British, these comprising 379 steamships of 1,320,000 tons, and 31 sailing vessels of 19,000 tons. In addition to the foregoing, the allies lost 776 trawlers, and neutral powers 196. The British loss is under 4% in numbers and slightly over 6% in tonnage, of the total register.

Coast, Lake and River Steamship Officers for 1916.

The following appointments made by navigation companies engaged in Canadian navigation for their various steamships and tugs, have been reported to Canadian Railway and Marine World, in addition to those published in our last issue. The names in the first column are those of the vessels; those in the second column, of the captains, and those in the third column, of the chief engineers.

CANADIAN GOVERNMENT RAILWAYS, MONCTON, N. B.
Leonard O. Dubois O. T. Williams
Prince Edward Island J. J. Merchison R. L. Main
Scotia No. 1 R. L. Maguire W. J. Johnson
Scotia No. 2 R. Keating W. Anderson
CHARLOTTETOWN STEAM NAVIGATION CO. LTD.
CHARLOTTETOWN, P.E.I.

Empress A. Cameron J. A. Rowe
Northumberland A. W. McLeod C. Cumming
This company is discontinuing business, and has sold the s.s. Northumberland to the Dominion Government.

CHATHAM NAVIGATION CO. LTD., CHATHAM, ONT.
Ossifrage T. J. Stockwell G. Peel

DETROIT AND WALLACEBURG STEAMSHIP LINE,
DETROIT, MICH.

Olcott T. Moore L. Miller
DOMINION TRANSPORTATION CO., CHICAGO, ILL.
Caribou A. A. Batten Jas. Nicoll
Manitou N. J. McCoy C. Kenny

MIRAMICHI STEAM NAVIGATION CO. LTD.,
CHATHAM, N. B.

Alexandra Jas. Nowlan W. S. Stewart
Miramichi J. P. Bullock N. Smith
Sybella H. Copp A. McIntyre

MONTREAL TRANSPORTATION CO. LTD., MONTREAL
Advance J. V. Norris M. J. Sherman
Bartlett A. Lepine Jr. J. P. Lappin
D. G. Thomson W. J. Murphy J. G. Lamoureux
Emerson W. H. Norcott D. Cameron
Glenmount L. Mallan
H. F. Bronson J. Reoch F. H. Brian
India W. F. Young R. G. Gibson
Kinmount T. Lepine H. Paus
M. P. Hall H. Desgroseillier
Mary L. G. Dixon M. Dickson
Rosemount C. E. Coons D. S. Symons
Simla W. H. Blackler R. Downie
Stormount J. Doyle A. Dunn
Windsor

MERCHANTS TRANSPORTATION CO. LTD., SYDNEY,
N. S.

Weymouth W. E. Leblanc P. Schrupp
NORTH SHORE STEAMSHIP CO. LTD., SYDNEY N.S.
Aspy D. McDonald S. O. White
PEACE RIVER NAVIGATION CO. LTD., EDMONTON,
ALTA.

Northland Call J. Willisroft A. Grant
PROGRESSIVE STEAMBOAT CO. LTD. VANCOUVER, B.C.
Harry S. J. R. Grauer G. Dennis
Maagen A. O. Clappitte O. Sherbruge
Progressive T. T. Edwards G. Dixon
Pronative A. Lewis O. Mathieson
Senator H. Grauer A. Toren

REID NEWFOUNDLAND CO.-ST. JOHN'S Nfld.
Argyle G. O'Reilly T. Moysk
Clyde J. Kneelock J. Pollock
Dundee D. Blandford H. Crawford
Ethie N. Day P. Burton
Glencoe A. Blandford F. C. Barnes
Home S. Harbin J. Cunningham
Kyle L. Stevenson J. MacFarlane
Meigle J. Goobie John MacFarlane
Sagona B. Taverner J. Buckingham
RICHMOND STEAMSHIP CO. LTD., SYDNEY, N.S.
Richmond W. H. Mischeau R. G. Morrison

ROSS NAVIGATION CO., LTD., PAS. MAN.
Brisban H. L. Weber B. M. Olde
Minasin H. H. Ross T. Paquette

JOHN WALTER, EDMONTON, ALTA.
City of Edmonton P. Christianson
WEST VANCOUVER FERRY CO. VANCOUVER, B.C.
Doncella J. Watson R. W. Pyne
Sonrisa D. Smith H. L. Thompson

Quebec Pilots and Apprentices.—A bill has been introduced in the House of Commons, amending the Canada Shipping Act as regards pilots and pilot apprentices in the Quebec Pilotage District, and providing that the number of pilots for that district shall not exceed 125, and that when the apprenticeship period of a pilot has been interrupted by sickness or other legitimate cause, he may be allowed to serve an additional period equal to the time lost, and if found otherwise qualified and entitled to a license, he may be granted such license after he has completed a full service period of seven years including the additional period.

Stranding of the s.s. Sarah Radcliffe.

An investigation into the stranding of the s.s. Sarah Radcliffe, owned by Evans-Thomas Radcliffe Co., Cardiff, Wales, and under charter to the Admiralty, on Georges Island, in Halifax Harbor, Mar. 23, was held at Halifax, Apr. 1, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. John Fleming and D. C. Stuart as nautical assessors. Following is a summary of the judgment: The court finds that the master and officers of the vessel are not to blame for the predicament in which the vessel was placed owing to dragging at her anchor, and attributes the stranding to an act of God. All directions given by the pilot were followed when first the vessel anchored, and again under the same pilot's direction, when the vessel was ordered to shift her berth, and at that time there were no indications of a change of weather. When the vessel began to drift, the essential duties of the master and officers were carried out. The vessel came off without much delay and with but little damage. The attention of the first and second officers was called to the fact that they had not taken bearings of objects which were then visible, to fix the exact position of their anchoring ground, and cautioning them that entries should have been made in the scrap log, and log of bearings, soundings, etc., and also of the precautionary measures taken for the safety of the vessel.

The Dominion Marine Association and the United States Seaman's Act.

In the U.S. Seamen's Act, now in force on the Great Lakes, a number of new regulations are provided, some of which affect Canadian vessels trading with U.S. ports. The sections of the act which affect Canadian vessel owners, are 4, 11, 13 and 16. The first amends a previous section and provides for the payment of seamen, on demand, of half of the wages earned, at any port where cargoes are taken on and delivered, the demand not to be made for five days after the commencement of a trip nor oftener than once in five days. This section is particularly made applicable to seamen on foreign vessels in U.S. harbors, and U.S. courts are to be open for its enforcement. Sec. 11 amends sections respecting advances of wages to seamen, and allotments of pay to dependents.

Sec. 13 provides, among other things, that no vessel of 100 tons or upwards shall depart from any U.S. port, unless she has on board a crew not less than 75% of which, in each department, are able to understand any order given by officers of the vessel, nor unless certain proportions of the crew, exclusive of licensed officers and apprentices, are of a rating not less than able seaman; and also provides for the issue of certificates by U.S. authorities. The Dominion Marine Association has taken this matter up with the U.S. Government, Francis King, M.A., Counsel for the Association, visiting Washington early in March, and it has been arranged that certificates of competent authorities in Canada will be accepted in the U.S. as proof that the holders comply with the provisions of sec. 13. The Dominion Department of Marine has prepared forms of certificate as required, and these are now in the hands of all collectors of customs. It has also issued a circular of instructions to col-

lectors, owners and masters, indicating exactly what is required.

Section 14 refers to steamboat inspection and particularly to life saving appliances, and does not affect Canadian vessels, as the reciprocal arrangement between the Dominion and the U.S. with regard to the inspection of steamboats, instead of being in the form of a treaty capable of abrogation by the President of the U.S., is embodied in an Act of Congress, which has not been repealed.

Masters of lake vessels having occasion to enter U.S. ports are now providing their deck crews with proper certificates, as far as possible. This requirement extends, for this year, to 40% of the deck crew, excluding the certificated officers. On an ordinary lake freighter, this means 40% of the deck hands, watchmen and wheelsman, and sometimes the second mate, as he does not require to be certificated. This means that about four men must be qualified under the statute, and arrangements are being made accordingly.

New Books, Etc.

Any of the books mentioned may be obtained through Canadian Railway and Marine World at the published price.

CANADA IN FLANDERS, by Sir Max Aitken, M.P. Cloth, 5 x 7½, 247 pages, with maps. Hodder & Stoughton, Toronto, 25c.

This is vol. 1 of the Official Story of the Canadian Expeditionary Force. Its 10 chapters deal with mobilization, warfare, Neuve Chapelle, Ypres, a wave of battle, Festubert, Givenchy, Princess Patricia's Light Infantry, the Prime Minister, the Canadian Corps. The six appendices contain the King's message to the Canadians, Canadians in dispatches, the Prime Minister and the war, Lieut.-Gen. Alderson, commanding the Canadian Corps, honors and rewards granted, statement of casualties.

COAL, ITS ECONOMICAL AND SMOKELESS COMBUSTION, by J. F. Cosgrove. Cloth, 5½ x 8½ ins., 273 pages, 32 tables, 33 illustrations. Technical Book Publishing Co., Philadelphia, Pa. \$3.

The 21 chapters deal with the following subjects: Classification of coals; characteristics of coal; coal classed according to use; composition of coal; effect of size of coal; clinkering of coal ash; prevention of clinker; geological history of coal; the coal fields of America; analysis of coal; the purchasing of coal; theory of combustion; combustion of coal; temperature of combustion; determining heat value of coal; burning bituminous coal; smoke and its prevention; burning coal smokelessly; draught regulation; hand fired furnaces; stoker furnaces.

STUDIES IN THE COST OF URBAN TRANSPORTATION SERVICE, by F. D. Doolittle, Director, Bureau of Fare Research, American Electric Railway Association. Cloth, 6 x 9 ins., 467 pages, 58 plans and charts. American Electric Railway Association, 8 West 40th Street, New York, N.Y.

This work, which includes among other things the results of a number of special investigations made by the Bureau, consists of 29 chapters dealing with the following subjects: Creating the street railway; the street railway as a going concern; elements of cost; the anatomy of the five cent fare; tendency of operating costs; utility capital and its replacement; actual returns in the traction business;

units of comparison; elements of service; traffic characteristics, the traffic survey; traffic observations; the application of traffic data; prescribed standards of service; psychological aspects of street railway service; special problems; the paying haul; cost of extending fare limits and lines; cost of service and the zone system of fares; cost of complying with standards of service; cost of extending the transfer privilege; cost of competing forms of transportation; effect of rate of fare on riding habit; the problem of rapid transit; regulation and the cost of service; the Cleveland experiments; events preceding the Taylor ordinance; the Taylor ordinance and defects in its operation as disclosed at arbitration; efforts since arbitration to reduce cost of operation to permit continuance of low fares; service rendered under ordinance regulation; actual cost of service under ordinance regulation; the Milwaukee experiment; events preceding the Railroad Commission of Wisconsin decisions of Aug. 23, 1912; the decision of Aug. 23, 1912 and its rescission, Jan 30, 1915; cost of service and decisions on line extensions; zone system transfers and service requirements; appeal of Nov. 6, 1915.

Board of Railway Commissioners' Judgment re Telegraph Tolls.

The Board of Railway Commissioners issued general order 163, Mar. 31, re applications of the telegraph companies for approval of their tariffs of tolls within the territory west of Sudbury, Ont., and between points east thereof and west thereof in both directions, and of the applications of the Winnipeg Board of Trade and the Winnipeg Grain Exchange, that the tolls into and out of Winnipeg be not approved. Upon hearing the matter at various sittings in the presence of representatives of the various telegraph companies, the Dominion Government, the Winnipeg Grain Exchange, the Boards of Trade of Winnipeg, Brandon, Regina, Vancouver, Victoria, Nelson, Saskatoon, Edmonton, Toronto and Montreal, the Associated Board of Trade of Western Canada and the Canadian Manufacturers Association, judgment was delivered, Mar. 28, by Commissioner McLean and concurred in by the other commissioners, and this judgment is made a part of the order and the tariff changes therein directed to be made are to become effective by July 1.

For the purposes of operation, the C.P.R. has divided the territory between the Atlantic and Pacific Oceans, which it covers, into districts as follows: (a) New Brunswick and Nova Scotia. 1—Quebec and Ontario, east of and including Windsor and Sudbury; 2—Ontario, west of Sudbury to and including Nipigon; 3—Sault Ste Marie Branch; 4—Ontario, west of Nipigon; 5—Manitoba; 6—Saskatchewan east; 7—Saskatchewan west; 8—Alberta, main line and branches south; 9—British Columbia, main line east of and including Kamloops and Okanagan branch; 10—British Columbia, all lines and west of Kamloops; 11—Alberta, north of main line; 12—Manitoba, for United States rates only; 13—British Columbia, Kootenay east of and including Kootenay Landing; 14—British Columbia, Kootenay west of Kootenay Landing.

In a portion of the territory east of the Great Lakes in which the Great North Western Telegraph Co.'s lines are located, there is an identity of districts. In the territory from the head of the Great

Telegraph, Telephone and Cable Matters.

A press report states that a telephone company is being organized locally, to be controlled by citizens of New Glasgow, Westville, Stellarton and Trenton, N.S.

N. S. McDonald, heretofore at Fort William, Ont., has been appointed local manager, Great North Western Telegraph Co., Saskatoon, Sask., vice J. W. Middlemas, resigned.

The Great North Western Telegraph Co.'s officials held their annual meeting at Toronto, Apr. 11, when various matters relating to the business were discussed, and suggestions considered for the continued improvement of the service.

The Great North Western Telegraph Co. has reopened its summer office at Little Metis Lighthouse, Que., and has closed its offices at St. Jean l'Evangeliste, Que., and Kemptville, Ont. The name of its office at St. Stanislas station, Que., has been changed to Deux Rivières.

J. W. Middlemas, local manager, Great North Western Telegraph Co., Saskatoon, Sask., has resigned to go into private business in Saskatoon. He entered G.N. W. Telegraph Co.'s service about 28 years ago, and spent 23 of them in Toronto. On Oct. 12 he was presented with a travelling bag by the local staff.

Great Lakes Terminal Elevator Co. Ltd. has been incorporated under the Dominion Companies Act, with \$800,000 authorized capital stock and office at Winnipeg, to carry on a general elevator, milling, shipping and mercantile navigation business.

Transportation Conventions in 1916.

May.—International Railway Fuel Association, Chicago, Ill.

May, 2-5.—Air Brake Association, Atlanta, Ga.

May 15-18.—International Railway Fuel Association, Chicago, Ill.

May 17.—Freight Claim Association, Washington, D.C.

May 17.—Association of Railway Claim Agents, Atlantic City, N.J.

May 23-26.—Master Boiler Makers' Association, Cleveland, Ohio.

June 14-17.—Master Car Builders' Association, Atlantic City, N.J.

June 19-22.—American Railway Master Mechanics' Association, Atlantic City, N.J.

June 20.—Train Despatchers' Association of America, Toronto, Ont.

June 20-22.—Association of Railway Telegraph Superintendents, St. Paul, Minn.

June 20-23.—American Association of Freight Agents, Cincinnati, Ohio.

June 21.—Train Despatchers' Association of America, Toronto.

June 21.—American Association of General Baggage Agents, Boston, Mass.

June 27.—American Society for Testing Materials, Atlantic City, N.J.

June 27-28.—Association of Transportation and Car Accounting Officers, Boston, Mass.

June 28.—Association of American Railway Accounting Officers, Detroit, Mich.

July.—International Railway General Foremen's Association.

August.—International Railroad Blacksmiths' Association, Chicago, Ill.

August 29.—International Railway General Foremen's Association, Chicago, Ill.

September 12-14.—Master Car and Locomotive Painters' Association of United States and Canada, Wilmington, Del.

September.—Railway Signal Association, Mackinac Island, Mich.

September 19-22.—Roadmasters and Maintenance of Way Association, Chicago, Ill.

October.—Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.

October 3-5.—Railway Fire Protection Association, New York.

October 17-19.—American Railway Bridge and Building Association, New Orleans, La.

October 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Philadelphia, Pa.

Semaphore Signals in Livingstone Channel.—In order to assist vessel masters in obeying the rule which requires an interval of not less than 5 minutes, between downbound vessels navigating the Livingstone Channel, two semaphore signals have been installed by the U.S. Lighthouse Bureau, the upper one being at Mamajuda rear light on the end of the lighthouse clock, and the lower one at Livingstone Channel pier light 9, on the west side of the north end of the cofferdam section. At night the position of the semaphore arm is shown by two fixed white lights, one at the end of the arm swinging with it, and the other stationary at the pivotal point. At each station the semaphore arms will occupy one of the two positions, either vertical or horizontal. If vertical, the way is clear with the required 5 minutes interval, if horizontal it will mean that the 5 minutes interval has not elapsed since the passage of the last downbound vessel, and consequently the way is not clear. The arm of the Livingstone Channel semaphore will be lowered to the horizontal position when a vessel passes it and will ordinarily be held in that position for one minute.

Montreal Marine Insurance Agency Ltd. has been incorporated under the Dominion Companies Act, with \$5,000 authorized capital and office at Montreal, to conduct an underwriter agency business for marine and other insurance. A. J. O'Keefe, F. J. Lynch, E. J. Duncan, H. W. Ives and J. Bough, all of New York, are the incorporators.

Port Mann, B.C., is not to become a city at present, the Legislature having refused to incorporate it.

100% Weighing Efficiency

most nearly approached with the

Fairbanks Dial Indicator

where rapid, accurate weighing is necessary. The full capacity dial increases speed and accuracy. It arrives automatically at balance. Figures are read direct from the dial. *Automatic to full capacity*, 500 lbs. x 1/4 lbs. and other combinations to 40,000 lbs.

This indicator can be attached to almost any scale in good working order.



The Canadian Fairbanks-Morse Co., Limited

ST. JOHN, QUEBEC, MONTREAL, OTTAWA, TORONTO, HAMILTON, WINNIPEG,
SASKATOON, CALGARY, EDMONTON, VANCOUVER, VICTORIA



Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Roberts & Schaefer Co., Engineers and Contractors, Chicago, report that the Western Dominion Collieries, Ltd., Taylor, Sask., have given them a contract for the installation of a coal mining tippie using a horizontal screen.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated:

Canadian Car Service Bureau—J. Reilly, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.

Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Associations—E. de la

Hooke, London, Ont.

Dominion Marine Association—F. King, Counsel, Kingston, Ont.

Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.

Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.

Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.

Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.

International Water Lines Passenger Association—M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee—James Morrison, Montreal.

Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.

Quebec Transportation Club—A. F. Dion, Quebec.

Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.

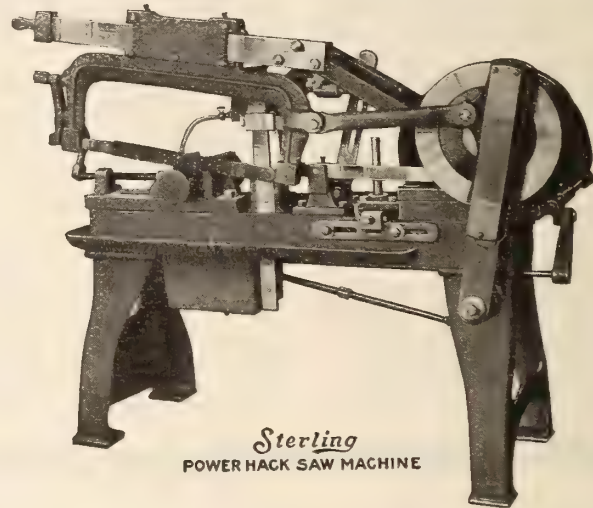
Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.

Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.

Western Canada Railway Club—Louis Kon, Box 1707 Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Winnipeg Traffic Club—James Gehrey, Bannatyne Avenue, Winnipeg, Man.

"STERLING" High Duty Power Hack Saw Machine



Sterling
POWER HACK SAW MACHINE

Cuts round material up to and including 6 in.

Manufactured by

Diamond Saw & Stamping Works,
Buffalo, N.Y., U.S.A.

Car Closets

Flush or Dry

DUNER CO. 101 S. CLINTON ST.
CHICAGO

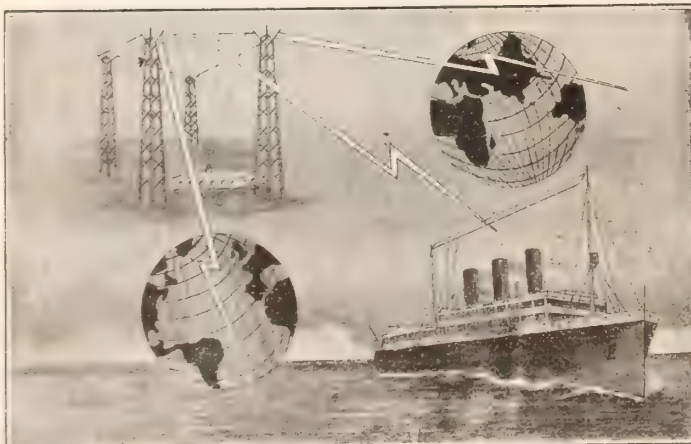
FOR TICKET CASES AND COMMERCIAL FURNITURE

of all descriptions to stock
or special design, apply to

The Canadian Office and School Furniture Co.,
Limited

Preston - Ontario

CONSULT "MARCONI"



THE WORLD WIDE WIRELESS

MARCONI WIRELESS

A Wireless Equipment on your vessel is a safeguard against **LOSS OF LIFE, PROPERTY** and **TIME**.

THE CHEAPEST FORM OF MARINE INSURANCE

We maintain an expert organization of engineers and operators who are at your service.

Consult us on all matters pertaining to wireless.

Canadian Marconi Company

137 McGill Street, MONTREAL

Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE—INTERCOLONIAL RAILWAY

Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

Montreal Locomotive Works, Limited

DOMINION EXPRESS BUILDING, MONTREAL, CANADA



MARTIN-SENOUR PAINTS AND VARNISHES



MADE IN CANADA

Marine Paint
Deck Paint
Hull Paint
Copper Paint
Seam Paint
Mast Paint
Dory Paint
Signal Paint
Smoke Stack Paint
Bunker Paint

The Martin-Senour line of Marine Paints and Varnishes is the most complete line manufactured in Canada.

There is a Martin-Senour finish for every purpose from stem to gudgeon. Each product guaranteed to best serve the purpose for which it is made.

Write for our Marine Catalogue and Color Chart

It's full of interest to the Marine Trade

Yacht Enamel
Engine Enamel
Canoe Enamel
Deck Furniture Enamel
Canvas Preservative
Railing Black
Ships Black
Durable Boat Spar Varnish
Boat Spar
Cabin Finish



The **MARTIN-SENOUR** *Co.*

LIMITED

PRODUCERS OF PAINTS AND VARNISHES

CHICAGO

MONTREAL

WINNIPEG

HALIFAX

• LINCOLN •

TORONTO





Minarets and Mountain Peaks

at luxurious Banff—in the very heart of the

Canadian Pacific Rockies

At Banff are all the fine touches of social life, good table, good service, every possible comfort at moderate cost. From the stone pillared verandah or from the wide windows of the hotel, lies spread the great panorama of Alps and river.

Reached only by the world's greatest transportation system—the

Canadian Pacific Railway

which maintains hotels at Banff, Lake Louise, Field, Glacier, Balfour.
Everything Canadian Pacific Standard—None Better.

For further information apply to
any Canadian Pacific Ticket
Agent or W. B. Howard, Dis-
trict Passenger Agent, Toronto.



Ontario Jockey Club TORONTO

Spring Meeting

May 20th to May 27th

The King's Plate

The oldest Fixture run continuously
on this continent, will be run on

Saturday, May 20th

General Admission \$1.50

JOS. E. SEAGRAM W. P. FRASER
President Sec'y-Treas.

Insist on having

DREWRY'S **American** STYLE RICE **BEER**

The best beer—
without exception

E. L. Drewry, Ltd., Winnipeg

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Cele-
brated Wheel Truing Brake Shoe.
Best Wheel Grinders in the World.

John Morrow Screw & Nut Co.,
Limited.

BUSINESS AS USUAL

Set Screws
Cap Screws
Nuts, every variety
of finish
Twist Drills, etc.

Customers are requested to place
their specifications with us as far
ahead of their actual needs as
possible so that we may give them
good service.

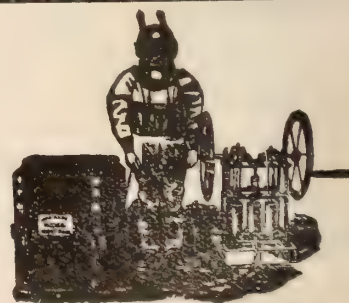
INGERSOLL - ONTARIO

The Preston Car & Coach Co., Limited

Preston, Ont.

Manufacturers of

Steam and Electric
Railway Cars and
Special Cars.



JOHN DATE

Manufacturer of

Diving Apparatus

For Sale or Hire

Brass Founder and Coppersmith
13-15 Concord St., Montreal



Which Method

prevails in your plant? Does it take two men to do one man's work.

Why don't you replace that old antiquated tool with a new up to date

Reece's New Screw Plate

These pictures do not exaggerate conditions as you can actually see them, if you will visit Machine Shops throughout the country.

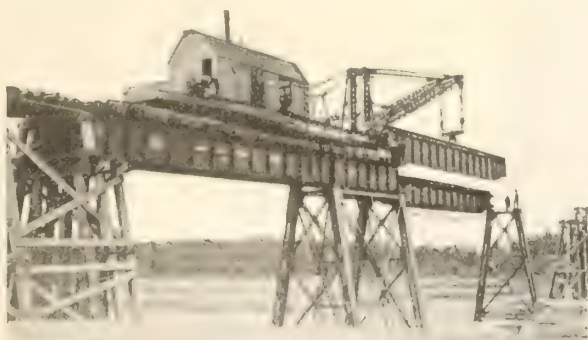
Lessen your cost by giving your mechanics a REECE'S NEW SCREW PLATE.

Butterfield & Co., Inc.

Rock Island, Que.

"BEATTY" HOISTS

For situation where the work is severe and the service exacting—"a Beatty always fills the bill"



Derrick car engaged with an 8 x 12 four drum Beatty Hoist placing an 80 foot deck plate girder span in Skugog River Bridge.

Let us know your requirements for
Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

We will gladly send full information.

M. Beatty & Sons Limited - Welland

Toronto Office—Goodyear Bldg. Telephone Adelaide 208.

Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg, Winnipeg.

The Ottawa Car

Manufacturing Co., Limited

Builders of

Electric Cars, Snow Sweepers and Plows

Also

Producers of Brass Castings of Every Description.

Slater Street - Ottawa

Rails, Cars, Locomotives

and Contractors' Equipment

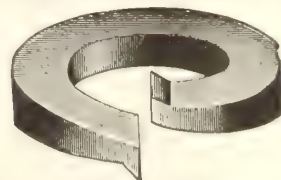
IMMEDIATE SHIPMENT

John J. Gartshore

58 Front St. West
TORONTO

The Positive Lock Washer

is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks

The Positive Lock Washer Co.
Sole Mfrs., Newark, N.J.

F. H. HOPKINS & CO.,

Agents, Montreal

Consolidated

600 volt—Switches—1800 volt

ARE

MECHANICALLY AND ELECTRICALLY CORRECT

Write us for further information.

Consolidated Car-Heating Co.
New York — Albany — Chicago

DAWSON & CO., AGENTS
148 McGill Street, MONTREAL, QUEBEC.

Hunt-Spiller Gun Iron

IN

Locomotive Castings

SAVES MONEY

INCREASES: Engine Efficiency—Engine Mileage.

DECREASES: Engine Failures—Engine Repairs.

MADE ONLY BY

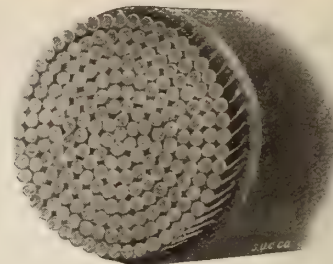
Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.

J. G. Platt,
Sales Manager.

Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.



5,000,000 C. M. Weatherproof Cable
($\frac{1}{2}$ Actual Size)

Our Facilities

for the manufacture of electric wires and cables enable us to supply all kinds and sizes and in any quantity. No order is too small to merit our attention and none so large as to tax our facilities.

Write our nearest office about your requirements.

**Standard Underground Cable
Co. of Canada, Limited**
Hamilton, Ont.

Montreal, Que. Winnipeg, Man. Seattle, Wash.

ESTABLISHED 1849.

BRADSTREET'S

Capital and Surplus, \$1,500,000.
Offices throughout the Civilized World.

Executive Offices:
NOS. 346 and 348 BROADWAY,
N.Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA:

Halifax, N.S.; Hamilton, Ont.; London, Ont.;
Montreal, Que.; Ottawa, Ont.; Quebec, Que.;
St. John N.B.; Toronto, Ont.; Vancouver, B.C.;
Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.;
Victoria, B.C.

THOS. C. IRVING.

Gen. Man. Western Canada, Toronto.

Brake Shoe Scrap Reduced To The Absolute Minimum



The Reinforced Brake Shoes here pictured were all worn down practically to the steel back.

The average weight of 100 shoes taken at random from this pile was about $5\frac{1}{2}$ lbs.

The roads using these shoes received about twice as much brake shoe service as could have been gotten from ordinary unreinforced shoes. It paid them and it will pay your road to use Reinforced Brake Shoes.

Manufactured in Canada.

Dominion Brake Shoe Company, Limited

350-356 St. James Street, MONTREAL

The Holden Co., Ltd., Agents



Capital Authorized.....\$10,000,000
Capital Paid up.....7,000,000
Reserve Fund.....7,000,000

Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the World.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.

Engineers and Contractors**JACOBS & DAVIES, Inc.**
Consulting EngineersMONTREAL LONDON NEW YORK
Foundations, Subaqueous and Land Tunnels, Subways, Railways, Harbours, Waterpower Development, Examinations, Reports.
Montreal Office: Eastern Townships Bank Building**ANGUS SINCLAIR, C.E.**

Railway Contractor

Office: Imperial Bank Building,
King and Sherbourne Sts., Toronto.**Locomotive COALING STATIONS****ROBERTS AND SCHAEFER CO.**
ENGINEERS AND CONTRACTORS
CHICAGO, U.S.A.Edward F. Terry
PresidentFrederick Tench
V. P. & Treas.**The TERRY & TENCH CO., Inc.**
Bridge BuildersGeneral Contractors, Engineers and Designers
Grand Central Terminal NEW YORK**Patent Solicitors****THE ARNOLD COMPANY**ENGINEERS—CONSTRUCTORS.
ELECTRICAL—CIVIL—MECHANICAL
REPORTS, DESIGN AND CONSTRUCTION
Complete Railway Shop and Terminal Properties—
Electrification of Steam Railroads.
OUR EXPERIENCE COVERS THIRTY-FIVE PLANTS
Chicago, Illinois.**ROSS THOMSON & CO.**MECHANICAL AND ELECTRICAL ENGINEERS,
PATENT ATTORNEYS.

Send for free book Patent Protection.

HOPE CHAMBERS - - OTTAWA, ONT.

PATENTS

HERBERT J. S. DENNISON

Mechanical Engineer, Patent Attorney and Expert.
Patents, Trade Marks, Designs, Copyrights, and
Infringements. 20 Years experience in Patents
and Practical Engineering.Star Building, 18 King Street West, Toronto
WRITE FOR BOOKLET.**PATENTS**SECURED OR OUR
FEES RETURNED.

Being next door to the Patent Office; we have personal interviews with Examiners, thus earlier allowance of your Patents. We have access to all Records and solicit the business of Manufacturers, Engineers and others who realize the advisability of having their Patent business transacted by Experts.

HAROLD C. SHIPMAN & CO.

Reg. Patent Attorneys Ottawa, Canada

VAN-HALLEN & O'NEIL

REGISTERED ATTORNEYS

at Washington and Solicitors of Canadian and Foreign Patents, Copyrights, Trade Marks, Searches.

Head Office, 103 Farmer Building, 333 Main Street.
WINNIPEG, MAN., Canada

Hotel Dennis

ATLANTIC CITY, N.J.

An American Plan Hotel that for the past fifteen years has been under the same management and developed on lines that appeal to people of refined taste.

It has a superior location. It is thoroughly modern. It is a recognized standard of excellence.

Capacity 600.

WALTER J. BUZBY

ROBERT W. HUNT
THOS. C. IRVING, JR.CHARLES WARNOCK
JAS. W. MOFFAT

Robert W. Hunt & Co., Limited

Consulting and Inspecting Engineers
Chemists and Metallurgists

Expert examination and tests of all steel and metal products; Bridges, Buildings, Cement; Electrical and Mechanical Plant Equipment; Rails and Fastenings; Cars; Locomotives; Pipe; Castings; Forgings; Lumber; Paving Materials.

Resident inspectors at all important manufacturing centres in Canada, the United States and Great Britain.

REPORTS ON PROPERTIES AND PROCESSES.

Head Office and Laboratories:

McGill Building, - - - MONTREAL, QUE.

Branches: TORONTO VANCOUVER LONDON, ENGLAND



Showing the construction of our geared jacks.

Celebrated "H & E" Lifting Jack

Our Patent Ball-Bearing Geared Jacks are Ideal in Railroad and Heavy Construction Work.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

SHERBROOKE, QUE.

Sole Agents for Brakeshoes for Canada outside of B.C., Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for B.C., The B.C. Equipment Co., Vancouver, B.C. Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.

High Grade Electric

STEEL CASTINGS MANGANESE STEEL

For Crusher Jaws and Heavy Wear Parts

BRONZE

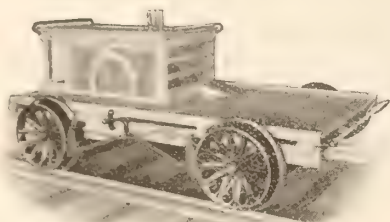
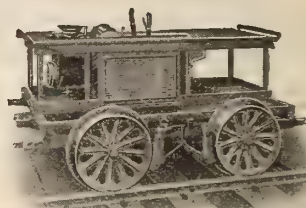
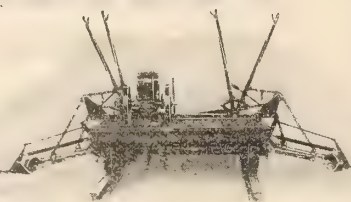
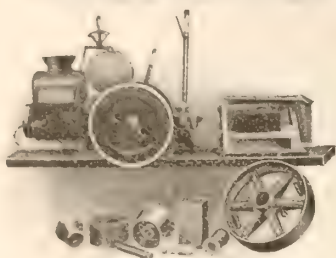
M.C.B. Standard Journal Bearings and Engine Bearings

Improved Reinforced Steel Backed

BRAKESHOES

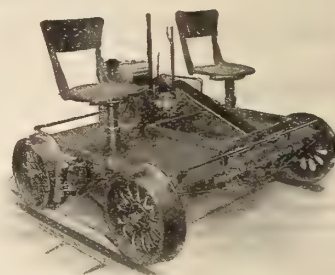
Locomotive Driver and Truck Shoes, Freight and Passenger Car and Electric Car Shoes.

FAIRMONT WINS GOLD MEDAL



The excellence of FAIRMONT Railway Motor Cars is attested by their receiving the highest competitive award, a gold medal, at the Panama-Pacific International Exposition, San Francisco.

Years of good service on Canadian railroads has proven the justice of this award. When you need a motor car, specify "FAIRMONT". Installation terms to private buyers.



FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

Formerly Fairmont Machine Co.

445 N. MAIN ST., FAIRMONT, MINNESOTA, U.S.A.

KINNEAR

STEEL ROLLING DOORS & SHUTTERS
BI-FOLDING & SLIDING DOORS
APPROVED FIRE DOORS

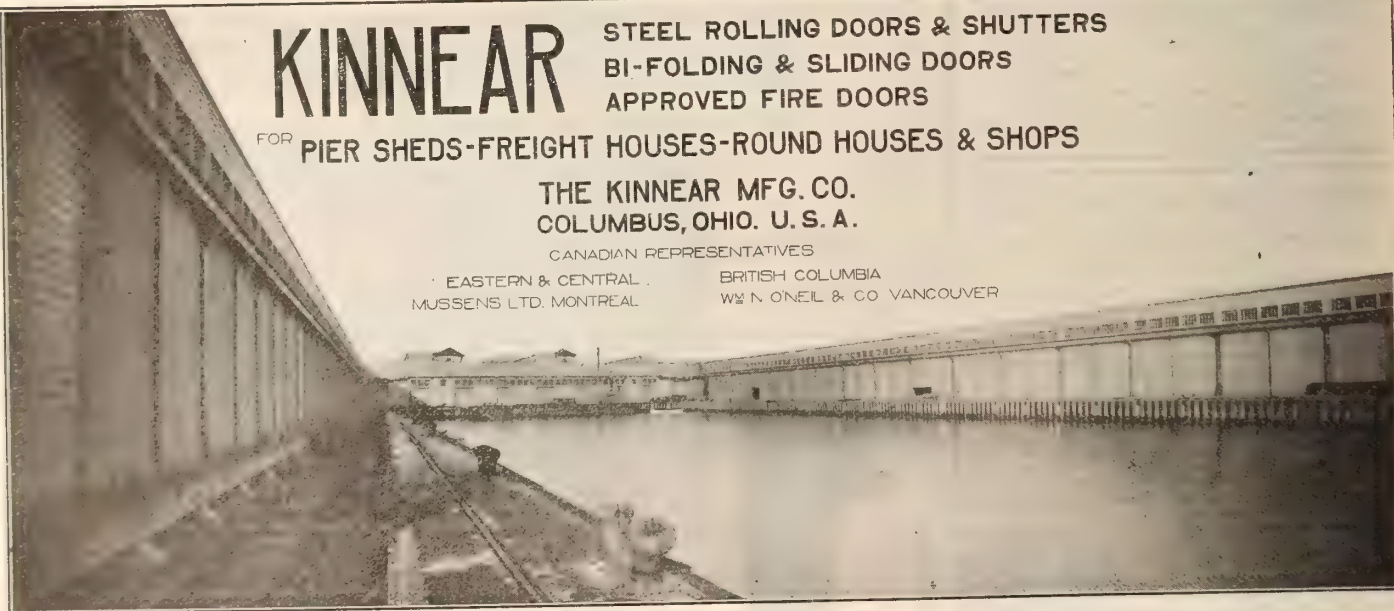
FOR PIER SHEDS-FREIGHT HOUSES-ROUND HOUSES & SHOPS

THE KINNEAR MFG. CO.
COLUMBUS, OHIO. U. S. A.

CANADIAN REPRESENTATIVES

EASTERN & CENTRAL
MUSSENS LTD. MONTREAL

BRITISH COLUMBIA
W. N. O'NEIL & CO. VANCOUVER



NICKEL

Shot—High and low carbon.

Ingots—Two sizes, 25 lbs., 50 lbs.

Electrolytic Nickel—99.80 p.c.

Prime Metals for the Manufacture of Nickel Steel, German Silver, Anodes and all remelting purposes. Our Nickel is produced as Rods, Sheets, Strip Stock, Wire and Tubes.

MONEL METAL We are **SOLE PRODUCERS** of this natural stronger-than-steel, non-corrodible alloy. Manufactured forms are Rods, Flats, Castings, Tubes, Sheets, Strip Stock and Wire.

Send Inquiries Direct to Us.

The International Nickel Company, 43 Exchange Place, New York



It Pays to carry an advertisement in the Canadian Railway and Marine World every issue of the year because you obtain proportionately better **Results**

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies.

ACETYLENE

Commercial Acetylene Ry., Lt. & Sig. Co.

AERATED WATERS

E. L. Drewry

AIR BRAKES AND FITTINGS

Canadian Westinghouse Co.

ALES

E. L. Drewry

ANGLE BARS

Steel Co. of Canada

AUTOMOBILES

Preston Car & Coach Co.

AXLES

Nova Scotia Steel and Coal Co.

Jas. W. Pyke & Co.

Steel Co. of Canada.

BATTERIES, DRY

Canadian National Carbon Co.

BATTERIES, SIGNAL

Canadian National Carbon Co.

BATTERIES, STORAGE

Canadian National Carbon Co.

BATTERIES, TRACK

Canadian National Carbon Co.

BATTERY SUPPLIES

Canadian National Carbon Co.

BOILER COMPOUND

Dearborn Chemical Co. of Canada

BOILERS

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

BOILERS, PORTABLE

F. H. Hopkins & Co.

Polson Iron Works

BOILERS, STATIONARY AND MARINE

Polson Iron Works

BOILERS, STEAM

Polson Iron Works

BOILERS, WATER TUBE

Babcock & Wilcox

Polson Iron Works

BOLTS AND NUTS

Steel Co. of Canada

BOLTS, TRACK

F. H. Hopkins & Co.

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

BORERS, CAR WHEEL

John Bertram & Sons Co.

BRAKE BEAMS

Buffalo Brake Beam Co.

BRAKE SHOES

Canada Iron Foundries

Canadian Brakeshoe Co.

Dominion Brakeshoe Co.

BRAKE SHOES, LOCOMOTIVE DRIVER

Canada Iron Foundries

BRIDGE BUILDERS

Terry & Tench Co.

BRIDGE NUMBERS

Acton Burrows, Limited

BRIDGES

Canadian Bridge Co.

Dominion Bridge Co.

BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION

Canadian National Carbon Co.

BUCKETS, COAL, ORE AND CONCRETE

M. Beatty & Sons

Brown Hoisting Machinery Co.

F. H. Hopkins & Co.

BUILDINGS, STEEL

Canadian Bridge Co.

Dominion Bridge Co.

BUMPING POSTS

F. H. Hopkins & Co.

CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED

Standard Und. Cable Co. of Can.

CARBONS, ARC LAMP, FLARE ARC AND PHOTOGRAPHIC

Canadian National Carbon Co.

CARBON SPECIALTIES

Canadian National Carbon Co.

CAR CLEANER

Allen General Supplies, Ltd.

CAR SIGNAL SYSTEMS

Ohio Brass Co.

CARS

Crossen Car Co.

Hart-Otis Car Co.

National Steel Car Co.

Ottawa Car Mfg. Co.

Preston Car & Coach Co.

CASTINGS

Crossen Car Co.

CASTINGS, BRASS

Canada Iron Foundries

Canadian Bronze, Limited

CASTINGS, CAR

Canada Iron Foundries

Dominion Brakeshoe Co.

CASTINGS, IRON

Canada Iron Foundries

Hunt-Spiller Manufacturing Corp.

CASTINGS, IRON AND STEEL

Dominion Brakeshoe Co.

Dominion Steel Foundry Co.

CASTINGS, MALLEABLE

Taylor & Arnold

CASTINGS, MANGANESE STEEL

Canadian Steel Foundries, Ltd.

CASTINGS, STEEL

Dominion Steel Foundry

CATENARY MATERIALS

Ohio Brass Co.

CHAINS

B. J. Coghlin Co.

F. H. Hopkins & Co.

CLOSETS, CAR

Duner Co.

COAL

Nova Scotia Steel and Coal Co.

COAL CHUTES

Roberts & Schaefer Co.

COAL DOCK BRIDGES

Roberts & Schaefer Co.

COAL MINING AND WASHING PLANTS

Roberts & Schaefer Co.

COALING STATIONS

Roberts & Schaefer Co.

COMPRESSORS, AIR

F. H. Hopkins & Co.

CONCRETE MIXERS & ROCK CRUSHERS

F. H. Hopkins & Co.

CONTRACTORS' SUPPLIES

F. H. Hopkins & Co.

Rice Lewis & Sons

CONVEYORS, COAL AND ASH

Babcock & Wilcox

COPPER, RODS AND WIRE

Standard Und. Cable Co. of Can.

COUPLERS, CAR & LOCOMOTIVE

Canada Iron Foundries, Ltd.

Ohio Brass Co.

Taylor & Arnold

CRANES

Brown Hoisting Machinery Co.

F. H. Hopkins & Co.

CRANES, WRECKING

F. H. Hopkins & Co.

CRANES, ELECTRIC

Babcock & Wilcox

Dominion Bridge Co.

F. H. Hopkins & Co.

CRANES, TRAVELLING

F. H. Hopkins & Co.

CROWBARS

B. J. Coghlin Co.

CULVERTS

Pedlar People, Ltd.

CURTAINS AND FIXTURES, CAR

Du Pont Fabrikoid Co.

Preston Car & Coach Co.

CUTS

Acton Burrows, Limited

DERRICKS

M. Beatty & Sons

F. H. Hopkins & Co.

DIES

Butterfield & Co.

DITCHERS

M. Beatty & Sons

F. H. Hopkins & Co.

DIVING OUTFITS

John Date

F. H. Hopkins & Co.

DOORS, STEEL ROLLING

Kinnear Manufacturing Co.

DOOR SIGNS

Acton Burrows, Limited

DRAFT GEAR

Standard Coupler Co.

DREDGES

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

DRILLS

John Morrow Screw & Nut Co.

DRILLS, AIR

F. H. Hopkins & Co.

Independent Pneumatic Tool Co.

DRILLS, WELL

F. H. Hopkins & Co.

DUMP CARS, CONTRACTORS'

Hart-Otis Can. Co.

F. H. Hopkins & Co.

DYNAMO AND ELECTRIC CASTINGS

Dominion Brakeshoe Co.

ECONOMIZERS

Babcock & Wilcox

ELECTRIC CAR ROUTE SIGNS

Acton Burrows, Limited

Preston Car & Coach Co.

ENAMELED IRON SIGNS

Acton Burrows, Limited

ENGINEERS

Arnold Co.

Jacobs & Davies

Roberts & Schaefer Co.

Angus Sinclair & Co.

ENGINES, AUTOMATIC

Polson Iron Works

ENGINES, HOISTING

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

ENGINES, STATIONARY AND MARINE

Polson Iron Works

ENGINES, STEAM

F. H. Hopkins & Co.

EXPRESS OFFICE SIGNS

Acton Burrows, Limited

FARE BOX HOLDERS

Coleman Fare Box Co.

FARE BOXES, P.A.Y.E. OPERATION

Coleman Fare Box Co.

FARE BOXES, PORTABLE AND STATIONARY

Coleman Fare Box Co.

FILES

Nicholson File Co.

FORGINGS

Champion Machine & Fdry. Co.

Crossen Car Co.

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

FURNACES, OIL AND GAS

Railway Materials Co.

GAUGE COCKS

Ohio Brass Co.

GAUGES, LOCOMOTIVE

Taylor & Arnold

GEARS AND PINIONS

Allen General Supplies, Ltd.

GRATES, SHAKING

Babcock & Wilcox

Polson Iron Works

HAMMERS, CAST STEEL

Dominion Brakeshoe Co.

HANDCARS

F. H. Hopkins & Co.

Crossen Car Co.

F. H. Hopkins & Co.

Rice Lewis & Sons

HANGERS, CABLE

Standard Und. Cable Co. of Can.

HEADLIGHTS

Commercial Acetylene Ry. Lt. and Sig. Co.

HEADLININGS

Crossen Car Co.

HEATING, CAR

Chicago Car Heating Co.

Consolidated Car Heating Co.

HOISTS, PNEUMATIC

Taylor & Arnold

HOISTS, STEAM

M. Beatty & Sons

HOOKS

Steel Co. of Canada

HOPPERS, CAR, WET OR DRY

Duner Co.

ILLUSTRATIONS

Acton Burrows, Limited

INSPECTIONS

R. W. Hunt & Co.

INSULATORS, PORCELAIN

Ohio Brass Co.

INSURANCE, ACCIDENT

Flange Lubrication Should be Automatic

Flange lubrication to be efficient should be automatic, absolutely independent of your engineer, and at the same time the device itself should be so simple and yet so accurate that it will be practically trouble proof. The

Detroit Automatic Flange Lubricator (Pendulum Type)

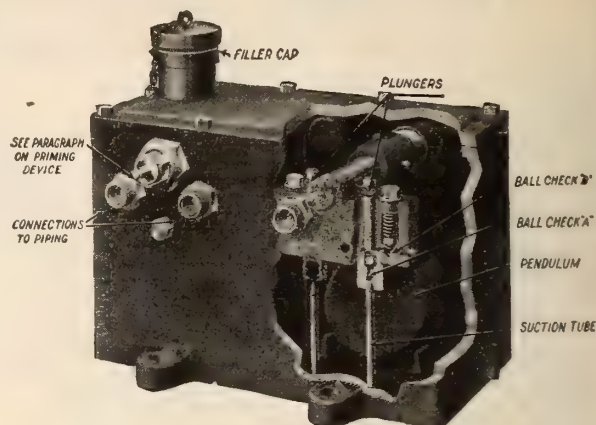
is absolutely automatic and at the same time simple. It is all in the pendulum. Any lateral movement of the locomotive causes the pendulum to swing. This oscillation rotates, rocker-like, the pendulum shaft, which produces alternating strokes of the two plungers in the pumping unit.

The use of the Detroit Automatic Flange Lubricator insures positive lubrication just when it is needed. May we send booklet F-O 81? It contains all the facts as well as drawings. Write to-day.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.

WALKERVILLE, ONT.

Canadian Sales Agents: Taylor & Arnold, Ltd., Montreal.



Complete Hydraulic Equipment

For Railway and Shipbuilding Plants

Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc. Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast Iron Pipe, Hydrants, Valves and Fittings, etc.

R. D. WOOD & CO. Philadelphia, Pa.

Electric Railway Supplies

Tool Steel Gears and Pinions.
Chillingworth Pressed Steel Gear Cases.
Knutson Trolley Retrievers.
Ideal Trolley Catcher.
Simplex Trolley Base.
Peerless Roller-bearing Trolley Base.
Perfectol Car Cleaner.

Allen General Supplies, Ltd.
205 Yonge Street, Toronto

The Canadian Bridge Co., Limited

Walkerville, Ontario

Locomotive
Turntables
Roofs
Steel Buildings

Manufacturers of

Railway and Highway
BRIDGES

Structural
Iron Work
of all
Descriptions

Sessions-Standard Friction Draft Gear

Simplest and Best

Both
Made by
Standard Coupler Co.
30 CHURCH STREET, NEW YORK

Standard Steel Platforms

Used by all Canadian Railways

J. S. COFFIN
President

SAMUEL G. ALLEN
1st Vice-President

W. H. COYLE
2nd Vice-President

C. L. WINEY
Sec'y. and Treas.

FRANKLIN RAILWAY SUPPLY COMPANY

Specialists—In Devices That Make for Economy

MAIN OFFICE, 30 CHURCH ST., NEW YORK

CHICAGO OFFICE: 332 South Michigan Ave.

MONTREAL OFFICE: 625 Transportation Bldg.

SAN FRANCISCO OFFICE: 795 Monadnock Bldg.

MARINE PAINTS AND VARNISHES

Martin Senour Co.
MARINE REPAIRS
 Goldschmidt Thermit Co.
MARINE SUPPLIES
 Rice Lewis & Sons
METALS
 Goldschmidt Thermit Co.
METAL WORK, STRUCTURAL
 Canadian Bridge Co.
 Dominion Bridge Co.
 Jas. W. Pyke & Co.
MILEPOST NUMBERS
 Acton Burrows, Limited
MONEL METAL
 International Nickel Co.
MOTOR CARS
 Fairmont Gas. Eng. and Ry.
 Motor Car Co.

MOTORS, TURNTABLE

Taylor & Arnold
NAILS, CUT AND WIRE
 Steel Co. of Canada
NICKEL, SHEET, ROD, WIRE & TUBE

International Nickel Co.
NICKEL, METALLIC SHOT & INGOTS

International Nickel Co.

NUMBERS

Acton Burrows, Limited

NUT LOCKS

Positive Lock Washer Co.

OFFICE FITTINGS

Can. Office & School Furn. Co.

OFFICE SIGNS

Acton Burrows, Limited

OILS

Galena-Signal Oil Co.

PACKING

Garlock Packing Co.

PAINTS

Martin Senour Co.

PATENT ATTORNEYS

H. J. S. Dennison

H. C. Shipman & Co.

Ross Thomson & Co.

Van Hallen & O'Neil

PILE DRIVERS, RAILWAY

F. H. Hopkins & Co.

PIPE, STEAM

Babcock & Wilcox

PIPE STOCKS

Butterfield & Co.

PIPE, WROUGHT, LEAD AND GALVANIZED

Steel Co. of Canada

PLANERS

John Bertram & Sons Co.

PLATFORMS, STEEL

Standard Coupler Co.

PLOUGHS, CONTRACTORS'

F. H. Hopkins & Co.

PORTER

E. L. Drewry

PUMPS

F. H. Hopkins & Co.

PUMPS, CENTRIFUGAL

M. Beatty & Sons

F. H. Hopkins & Co.

R. D. Wood & Co.

PUNCHES AND SHEARS

Long & Allstatter Co.

PUTTY

Steel Co. of Canada

RAIL BONDS

Ohio Brass Co.

Elec. Railway Improvement Co.

RAIL BENDERS

Canadian Steel Foundries, Ltd.

RAIL JOINTS

Goldschmidt Thermit Co.

The Rail Joint Co. of Canada

RAILS, NEW

Algoma Steel Corporation
 Dominion Iron & Steel Co.
 J. J. Gartshore
 F. H. Hopkins & Co.
RAILS FOR RELAYING
 J. J. Gartshore
 Jas. W. Pyke & Co.
RAILWAY SUPPLIES
 Franklin Railway Supply Co.
 F. H. Hopkins & Co.
 Rice Lewis & Sons
 The Hiram L. Piper Co.
REAMERS
 Butterfield & Co.
REPLACERS, CAR AND LOCO-
MOTIVE
 F. H. Hopkins & Co.

RIVETS

Steel Co. of Canada, Ltd.
ROCK CRUSHERS
 F. H. Hopkins & Co.
ROPES, DERRICK
 Dominion Wire Rope Co.

ROOFING, CAR

Franklin Railway Supply Co.

F. H. Hopkins & Co.

RUBBER GOODS

Can. Consolidated Rubber Co.

SANDERS, PNEUMATIC

Ohio Brass Co.

SAWS, HACK

Diamond Saw & Stamping Co.

SCOWS, DUMP AND DECK

M. Beatty & Sons

SCREW PLATES

Butterfield & Co.

SCRAPERS, WHEEL AND DRAG

F. H. Hopkins & Co.

SCREWS, WOOD AND MACHINE

John Morrow Screw and Nut Co.

Steel Co. of Canada

SEMAPHORE ARMS

Acton Burrows, Limited

SHIPS

Polson Iron Works

SIGNAL HOUSE NUMBERS

Acton Burrows, Limited

SIGNALS

Gen. Railway Signal Co. of Can.

The Hiram L. Piper Co.

SIGNS

Acton Burrows, Limited

SKYLIGHTS

Kinnear Manufacturing Co.

SNOW PLOUGHS

Crossen Car Co.

F. H. Hopkins & Co.

SPIKES, RAILWAY, SHIP OR

PRESSED

Nova Scotia Steel and Coal Co.

Steel Co. of Canada

SPLICING TUBES AND COM-

POUNDS

Standard Und. Cable Co. of Can.

SPREADER CARS

F. H. Hopkins & Co.

SPRINGS

Canadian Steel Foundries, Ltd.

B. J. Coghlin & Co.

SPRINKLERS, ELECTRIC

Preston Car & Coach Co.

STAPLES

Steel Co. of Canada

STATION NAME SIGNS

Acton Burrows, Limited

STAYBOLT IRON

Taylor & Arnold

STAYBOLTS, FLEXIBLE

Flannery Bolt Co.

STAYBOLTS, LOCOMOTIVE

Flannery Bolt Co.

STAYBOLT TAPS

Butterfield & Co.

STEAM HAMMERS

John Bertram & Sons Co.
STEAM SHOVELS
 M. Beatty & Sons
 F. H. Hopkins & Co.
STEAMSHIP SIGNS
 Acton Burrows, Limited
STEEL
 F. H. Hopkins & Co.
 Nova Scotia Steel and Coal Co.
STEEL, FIRE BOX
 Taylor & Arnold
 Canadian Steel Foundries, Ltd.
STEEL FOR AXES
 Canadian Steel Foundries, Ltd.
STEEL FOR SAWS
 Canadian Steel Foundries, Ltd.
STEEL FOR TIRES
 Steel Co. of Canada
STEEL SHAFTING
 Nova Scotia Steel and Coal Co.
STEEL PLATES
 Jas. W. Pyke & Co.
STEEL, TOOL
 Canadian Steel Foundries, Ltd.
 F. H. Hopkins & Co.
STOKERS, MECHANICAL
 Babcock & Wilcox
STRAINERS
 Babcock & Wilcox
SUPERHEATERS
 Babcock & Wilcox
 Locomotive Superheater Co.
SWITCH TARGETS
 Acton Burrows, Limited
TACKS
 Steel Co. of Canada
TANKS AND TANK FIXTURES
 F. H. Hopkins & Co.
 Polson Iron Works
TANKS, PORTABLE ACETY-
LENE, WELDING
 Commercial Acetylene Ry. Lt. and Sig. Co.

TAPS

Butterfield & Co.
TELEGRAPH AND TELEPHONE
OFFICE SIGNS
 Acton Burrows, Limited
TERMINALS, JUNCTION BOXES
 Standard Und. Cable Co. of Can.
THERMIT
 Goldschmidt Thermit Co.
TIE PLATES
 Algoma Steel Corporation
 B. J. Coghlin
 Nova Scotia Steel & Coal Co.
 Steel Co. of Canada
TICKET CASES
 Canadian Office & School Fur. Co.
TIRES, STEEL
 Jas. W. Pyke & Co.
TOOLS AND SUPPLIES
 F. H. Hopkins & Co.
 Pratt & Whitney Co.
TOOLS, CAST STEEL
 Dominion Brakeshoe Co.
TOOLS, TRACK
 John Bertram & Sons Co.
 Canadian Steel Foundries, Ltd.
 B. J. Coghlin Co.
 F. H. Hopkins & Co.
TOOLS, PNEUMATIC
 Independent Pneumatic Tool Co.
TRAMWAY EQUIPMENT
 J. J. Gartshore
 F. H. Hopkins & Co.
TRACK EQUIPMENT
 F. H. Hopkins & Co.
TROLLEY BASES
 Allen General Supplies, Ltd.
 Ohio Brass Co.
 Trolley Supply Co.
TROLLEY CATCHERS
 Allen General Supplies, Ltd.

TROLLEY GUARDS

Ohio Brass Co.
 Trolley Supply Co.
TROLLEY RETRIEVERS
 Allen General Supplies, Ltd.
 Ohio Brass Co.
 Trolley Supply Co.
TROLLEY WHEELS
 Star Brass Works
TRUCKS, ELECTRIC CAR
 Canadian Steel Foundries, Ltd.
TRUSSES, ROOF
 Canadian Bridge Co.
 Dominion Bridge Co.
TUBES, BOILER
 F. H. Hopkins & Co.
TUBE CLEANERS
 F. H. Hopkins & Co.
TURNBUCKLES
 Canadian Steel Foundries, Ltd.
TURNTABLES
 Canadian Bridge Co.
 Dominion Bridge Co.
UPHOLSTERY, CAR
 Du Pont Fabrikoid Co.
VALVES
 Canadian Detroit Lubricator Co.
 R. D. Wood & Co.
VALVES, ANGLE AND GLOBE
 Ohio Brass Co.
VALVES, BRASS GATE
 Ohio Brass Co.
VALVES, LOCOMOTIVE POP
 Taylor & Arnold
VARNISHES
 Berry Bros.
 Martin Senour Co.
VENTILATORS, CAR
 Automatic Ventilator Co.
VESSELS
 Polson Iron Works
WASHERS
 Steel Co. of Canada
WASTE
 B. J. Coghlin Co.
WATER SOFTENERS & PURI-
FIERS
 Babcock & Wilcox
 Dearborn Chemical Co. of Can.
WELDING
 Goldschmidt Thermit Co.
WHEELBARROWS
 F. H. Hopkins & Co.
WHEEL GRINDERS
 Griffin and Brinkerhoff
WHEELS, CAR
 Canada Iron Foundries
 Jas. W. Pyke & Co.
WHEELS, LOCOMOTIVE
 Canada Iron Foundries
WHITE LEAD
 Steel Co. of Canada
WIRE AND WIRE ROPE
 Dominion Wire Rope Co.
WIRE, BARE COPPER
 Standard Und. Cable Co. of Can.
 Steel Co. of Canada
WIRE, BRASS, IRON AND STEEL
 Steel Co. of Canada
WIRE, INSULATED COPPER
 Standard Und. Cable Co. of Can.
 Steel Co. of Canada
WIRE GOODS, BRIGHT
 Steel Co. of Canada
WIRE, TELEGRAPH AND TELE-
PHONE
 Standard Und. Cable Co. of Can.
 Steel Co. of Canada
WIRE, TRANSMISSION AND
TROLLEY
 Standard Und. Cable Co. of Can.
WRENCHES, CAST STEEL
 Dominion Brakeshoe Co.
YACHTS
 Polson Iron Works

CHICAGO CAR HEATING CO.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES

Canadian Factory and Office—61 Dalhousie St., Montreal A. D. BRUCE, Agent

GENERAL OFFICES:

RAILWAY EXCHANGE, CHICAGO, U.S.A.
 NEW YORK, GRAND CENTRAL TERMINAL BLDG.
 ATLANTA GA., CANDLER BLDG.
 WASHINGTON, D.C., MUNSEY BLDG.

C. W. Sherman, Pres. and Gen. Mgr.

F. W. Baillie, Vice-Pres.

J. E. Hammond, Secy.-Treas.

Dominion Steel Foundry Company, Limited, Hamilton, Ont.

Locomotive Frames

Car Bolsters

Car Castings

Heavy Machinery Castings

Alphabetical List of Advertisers

A					
Algoma Steel Corporation.....	18	Dominion Bridge Co.....	25	M	
Allen General Supplies, Ltd.....	82	Dominion Iron & Steel Co.....	23	Martin-Senour Co., The.....	75
Arnold Co.	79	Dominion Iron & Wrecking Co....	84	Montreal Locomotive Works.....	75
Association of Manufacturers of		Dominion Steel Foundry Co.....	83	Morrow, John Screw & Nut Co....	76
Chilled Car Wheels.....	7	Dominion Wire Rope Co.....	8	N	
Automatic Ventilator Co.....	25	Drewry, E. L., Ltd.....	76	National Steel Car Co.....	86
B		Duner Co.....	74	Nicholson File Co.....	10
Babcock & Wilcox.....	21	Du Pont Fabrikoid Co.....	16	Norton, A. O., Inc.....	11
Beatty, M. & Sons, Co.....	77	E		Northern Electric Co.....	24
Berry Bros.....	12	Electric Railway Improvement Co.	23	Nova Scotia Steel & Coal Co....	15
Bertram, John & Sons, Co.....	1	F		O	
Bradstreet Company.....	78	Fairmont Gas Engine & Ry. Mo-		Ohio Brass Co.....	9
Brown Hoisting Machinery Co....	3	tor Car Co.....	80	Ottawa Car Manufacturing Co..	77
Buffalo Brake Beam Co.....	20	Flannery Bolt Co.	13	P	
Burrows—Acton Burrows, Ltd....	24	Franklin Railway Supply Co.....	82	Pedlar People, Ltd.....	2
Butterfield & Co.....	77	G		Piper, The Hiram L., Co.....	24
C		Galena-Signal Oil Co.....	5	Polson Iron Works.....	17
Canada Iron Foundries, Ltd.....	21	Garlock Packing Co.....	14	Positive Lock Washer Co.....	77
Canadian Brakeshoe Co.....	79	Gartshore, J. J.....	77	Pratt & Whitney Co. of Canada..	22
Canadian Bridge Co.....	82	General Ry. Signal Co. of Canada	6	Preston Car and Coach Co.....	76
Canadian Bronze, Ltd.....	24	Goldschmidt Thermit Co.	12	Pyke, J. W. & Co.....	19
Canadian Consolidated Rubber Co.	26	Grand Trunk Railway.....	11	R	
Canadian Detroit Lubricator Co.	82	Griffin & Brinkerhoff.....	76	Rail Joint Co. of Canada.....	85
Canadian Fairbanks-Morse Co....	73	H		Roberts & Schaefer Co.....	79
Canadian Government Railways..	20	Hart-Otis Car Co.	9	S	
Canadian Locomotive Co.....	16	Hopkins, F. H. & Co.....	8	Shipman, Harold C., & Co.....	79
Canadian Marconi Co.....	74	Hunt, Robert W. & Co.....	79	Sinclair, Angus.....	79
Canadian National Carbon Co....	23	Hunt-Spiller Mfg. Corporation...	78	Standard Coupler Co.....	82
Canadian Northern Railway.....	17	I		Standard Underground Cable Co.	
Canadian Office & School Furni-		Imperial Bank of Canada.....	78	of Canada.....	78
ture Co.....	74	*Imperial Guar. & Acc. Ins. Co.	—	Star Brass Works.....	21
Canadian Pacific Railway.....	76	Independent Pneumatic Tool Co.	20	Steel Co. of Canada.....	4
Canadian Steel Foundries, Ltd....	15	International Correspond. Schools	25	T	
Canadian Westinghouse Co.....	2	International Nickel Co.....	80	Taylor & Arnold.....	19
Chicago Car Heating Co.....	83	J		Terry & Tench Co.....	79
Coghlin, B. J., Co.....	22	Jacobs & Davies.....	79	Thomson, Ross & Co.....	79
Commercial Acetylene Ry., Light		K		Trolley Supply Co.....	18
& Signal Co.....	19	Kinnear Manufacturing Co.....	80	V	
Consolidated Car Heating Co.....	77	L		Van Hallen & O'Neil.....	79
Crossen Car Co.....	14	Lewis, Rice & Son.....	22	W	
D		Locomotive Superheater Co.....	18	Wood, R. D., & Co.....	82
Date, John.....	76	Long & Allstatter Co.....	10	*Advertisements marked with an	
Dearborn Chemical Co. of Canada	13	M		asterisk appear in alternate issues.	
Dennis Hotel.....	79	N			
Dennison, H. J. S.....	79	O			
Diamond Saw & Stamping Works	74	P			
Dominion Brakeshoe Co.....	78	R			

Dominion Iron & Wrecking Company

LIMITED

Railway Equipment, Rails and Machinery

Dismantlers of BRIDGES, PLANTS, STEAMERS, MILLS
Dealers in IRON, STEEL, SCRAP METALS

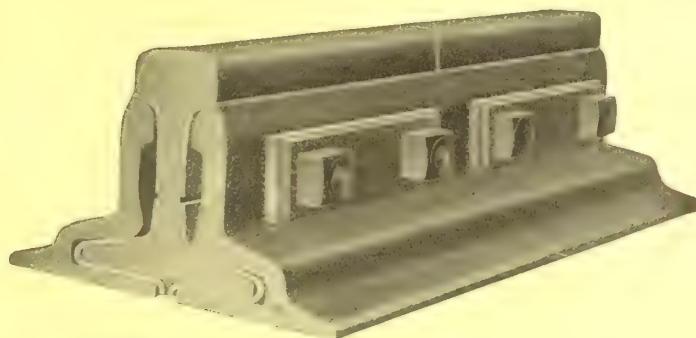
General Offices: Transportation Building
TORONTO

QUEBEC

MONTREAL, QUE.
ST. JOHN, N.B.

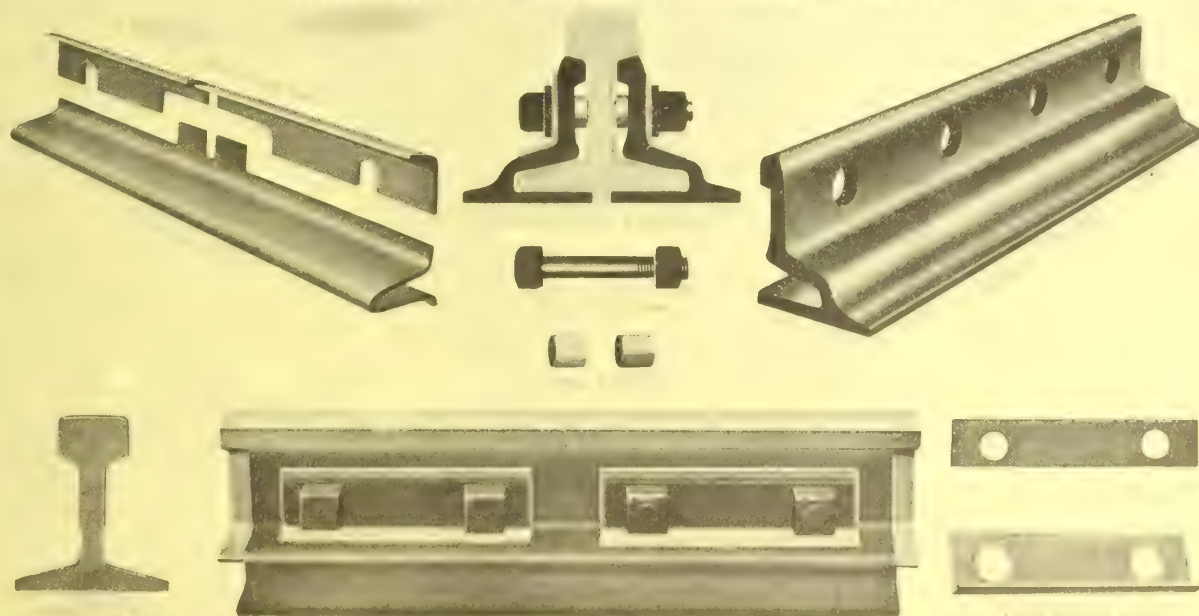
The Rail Joint Company of Canada Limited

McGill Bldg., MONTREAL



CONTINUOUS INSULATED JOINT AND

CONTINUOUS INSULATED JOINT PARTS



Makers of
Continuous, Weber, Wolhaupter and 100 p.c. Rail Joints.
Standard Insulated Step Frog and Switch.

Protected by Patents.

Grand Prize, San Francisco, 1915.



Here's what we do for you!!

Our Traffic Engineers know from actual experience the Hauling Problems of every business. This knowledge is worth money to you—if you will use it. We maintain a staff of trained Traffic Engineers who will tackle your problems of Haulage and Delivery in a business-like way, and give you a report that will present in facts and figures the most economical method that you can adopt to get the most efficiency in the delivery end of your business.

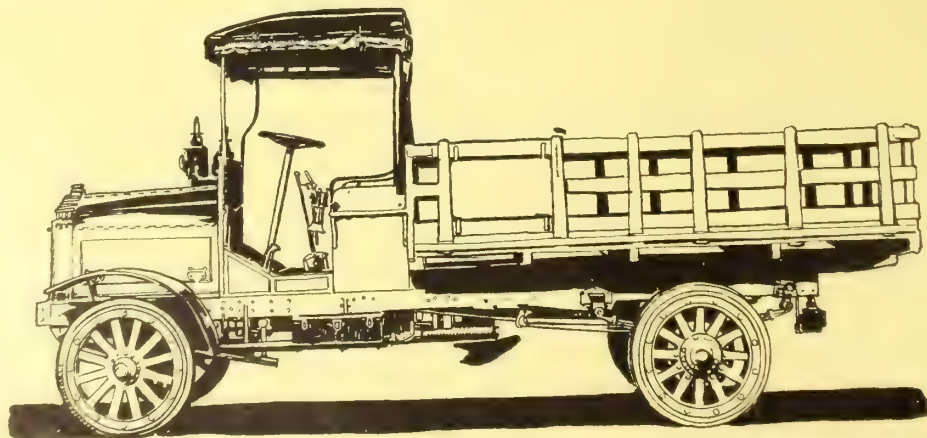
NATIONAL Motor Trucks are made in four models—1500 pounds, 2000 pounds, 4000 and 7000 pounds. Capacities that provide a Truck for every line of business.

If you are as thorough in your investigation of the different makes of Trucks as we are in the construction of the NATIONAL, you will own a NATIONAL Truck.

Conferring with us entails no obligation. Catalogue mailed upon request.

National Steel Car Company, Limited

Works and Operating Office: HAMILTON, CAN. Montreal Office; SHAUGHNESSY BLDG.



Canadian Railway AND Marine World

ESTABLISHED 1898.

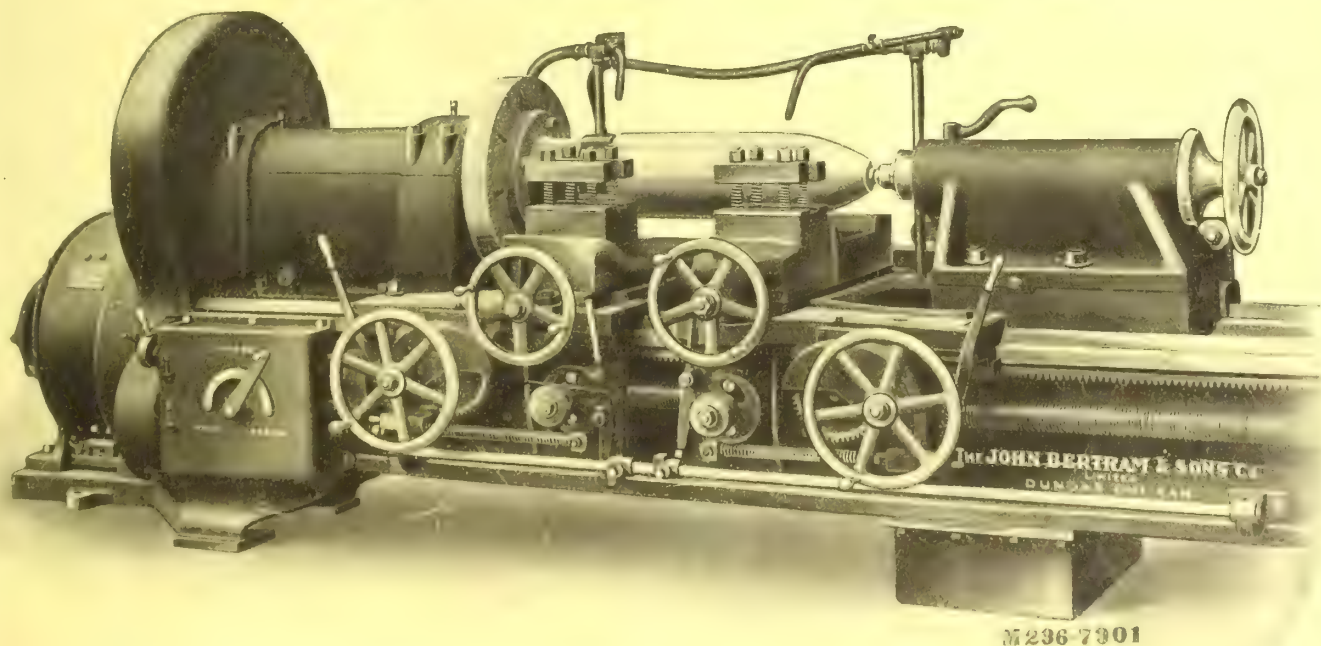
Number 220

TORONTO, CANADA, JUNE, 1916

Subscription Rates, Page 233



BERTRAM MACHINE TOOLS



A Single Purpose Lathe for Machining 9.2" H.E. Shells

One carriage is arranged to form the nose of the Shell while the other is turning the parallel part of the body.

We also furnish a similar type of machine arranged for machining the driving band seat of 9.2" Shells including wave ribbing and undercutting.



The John Bertram & Sons Co., Limited
DUNDAS, ONTARIO, CANADA

MONTREAL
723 Drummond Bldg.

WINNIPEG
1205 McArthur Bldg.

VANOUVER
609 Bank of Ottawa Bldg.



The Best Way to Please

your passengers is to make them comfortable during hot weather by equipping your sleepers, parlor cars and diners with—

Westinghouse Coach Fans



The motors of these fans have no hum, and the unavoidable whir of a volume of air at high speed is reduced to a minimum.

The road adopting Westinghouse Electric Fans is not troubled with maintenance cost; oil the bearings of the fans once a season and they will last indefinitely.

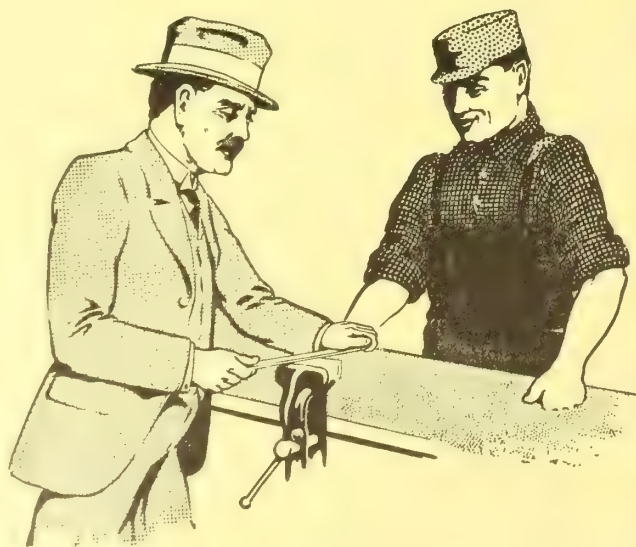
Send for Catalogue 8—B, describing our full line of coach fans.



Westinghouse Stationary Bracket Fans.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

TORONTO, Traders Bank Bldg. MONTREAL, 52 Victoria Sq. OTTAWA, Ahearn & Soper, Ltd. HALIFAX, 105 Hollis St. FT. WILLIAM, Telfer Bldg.
WINNIPEG, 158 Portage Ave. E. CALGARY, Grain Exchange Bldg. EDMONTON, Dominion Bldg. VANCOUVER, Bank of Ottawa Bldg.



Put Yourself in His Place

Here is a man at a bench, filing.

The file is worn.

He makes three strokes where, with a sharp file, he need make but one.

It takes him three times as long to do the job.

When it is finished, he is not as well satisfied with it as he would have been if he had a proper file.

The foreman thinks the man is slow or lazy. The man's time sheet does not give him as good a record as the man who is working at the next bench with a sharp file. The man gets irritated. So does the foreman and the employer who pays the bills.

But, throw away that file the minute it reaches its "inefficient point" and what do you get?

The new file costs a few cents. The man does his work in one-third of the time. He is more satisfied with his job. The foreman is pleased with the man—and the employer has saved money on the time sheet.

See to it that the first condition of affairs described is not common in your factory. Instruct your foremen to educate their workmen to turn in files the moment they reach their "inefficient point." Your investment in new files will more than pay for itself.

Nicholson File Company

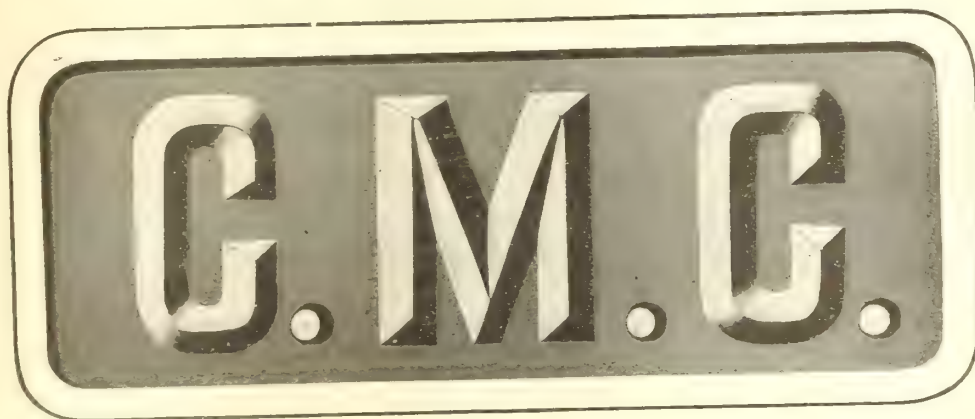
Port Hope

(Dealers Everywhere)

Ontario

EVERY MACHINE

Manufactured by Us Bears
This Registered Trade Mark



This Trade Mark is a guarantee that the materials, design and workmanship are of the highest class.

Insure satisfactory service by insisting on having this Trade Mark on your—

**Wood and Iron Working
Machine Tools**

For convenience of the trade we have opened show-rooms in Toronto, at Brock Avenue Subway, where a full line of our machinery can be inspected.

CANADA MACHINERY CORPORATION
LIMITED

GALT, ONTARIO

Builders of Machine Tools and Woodworking Machinery.



Quality



Service



The Steel Company of Canada, Limited

PRODUCTS

"HAMILTON" PIG IRON
BASIC, MALLEABLE AND FOUNDRY

IRON AND STEEL
BLOOMS, BILLETS, BARS, WIRE RODS, ANGLES, CHANNELS,
PLOW BEAMS, ETC.

FORGINGS

Car Axles, Shape and Drop Forgings, Horse Shoes, Carriage and Automobile Hardware, Top Goods, Etc.

WIRE, ETC.

Steel, Brass, Copper and Bronze, Heavy and Fine, Bright Annealed, Coppered, Liquor Bright Galvanized and Tinned. Stranded, Steel and Copper Cable, Clothes Line, Wire Nails, Staples, Barb Wire, Woven Wire Fencing, Fence Gates

RAILWAY FASTENINGS

Angle Bars, Track Bolts, Tie Plates, Spikes, Tie Rods, Etc.

NAILS, SPIKES, RIVETS, ETC.

Wire, Cut, Boat and Horse Shoe Nails, Railway, Pressed and Drift Spikes
Tack and Shoe Nails, Steel and Copper Rivets and Burrs, Iron, Brass and Copper

POLE LINE HARDWARE

Pole Steps, Cross Arm Braces, Guy Clamps and Guy Rods, Etc., Black and Galvanized

BOLTS, NUTS AND WASHERS

Machine, Carriage, Elevator, Stove, Tire and Sleigh Shoe Bolts, Blank, Tapped Nuts and Washers

WROUGHT PIPE

Black and Galvanized Nipples and Couplings

SCREWS

Wood and Machine Steel, Brass and Bronze

LEAD PRODUCTS

Lead Pipe, White Lead, Shot and Putty

The Steel Company of Canada, Limited

HAMILTON

TORONTO

MONTREAL

WINNIPEG



GALENA OILS

HAVE NO EQUAL IN
QUALITY, EFFICIENCY and ECONOMY

SOLE MANUFACTURERS OF
Celebrated Galena Coach, Engine and Car Oils
LUBRICATION ON A GUARANTEED BASIS

ELECTRIC RAILWAY LUBRICATION
A SPECIALTY

Perfection Valve and Signal Oils

Galena Railway Safety Oil—Made especially for use in
headlights, marker and classification lamps.

Galena Long Time Burner Oil—For use in switch and
semaphore lamps, and all lamps for long time burning,
avoiding smoked and cracked chimneys and crusted
wicks.

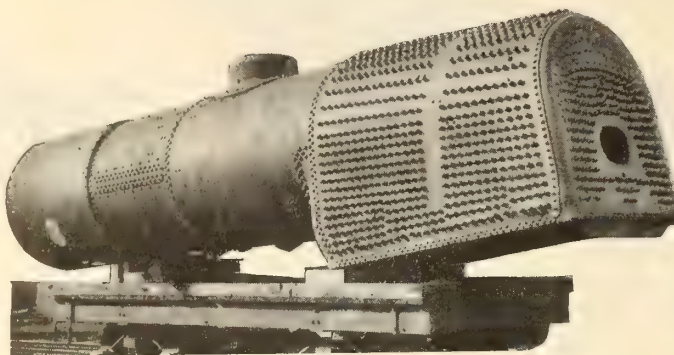
TESTS AND CORRESPONDENCE SOLICITED

Galena Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.



The Tate Flexible Staybolt

is a reliable standard for locomotive fireboxes.

We have yet to learn of one instance where the TATE FLEXIBLE STAYBOLT has failed to give better service than any staybolt used in locomotive boiler staying.

Better service, not only from the standpoint of staybolt durability, but also contributing to the longer life of the firebox, by the provisions that the Tate Bolt affords for the freedom of sheet movement under expansion.

Rigid firebox construction belongs to the practices of the past, unnatural and unreliable. Flexible connections in the staying members is the simplest method for allowing the firebox to expand under the least restriction.

When you apply Tate Flexible Staybolts to cover the zone of greatest sheet expansion, you have conserved the material or service life of both staybolt and sheet accordingly.

USED ON MORE THAN 500 RAILROADS.

Flannery Bolt Company — Manufacturers

Vanadium Building, Pittsburgh, Pa.

Canadian Allis-Chalmers, Limited, Toronto, Ontario

(Manufacturers for Canadian requirements)

Canuck Supply Co.

LIMITED

Railway Material and Supplies

418 ST. JAMES STREET

Montreal, P. Q.

Canada

Anchor Steam and Hydraulic Packings
American Security Sectional Arch
Baker Valve Gear
Bosher Carbon and High Speed Steels
Brubaker Taps, Dies and Reamers
Canuck Leather Packings
Canuck Front End Paint
Casey-Cavin Power Reverse Gear
D. & M. Hot Water Injectors
Forsters Locomotive Cement
Glidden Finishing Materials
Hunt-Spiller Gun Iron
King Metallic Packing
Radial Buffer
Rome Superior Staybolt Iron
Wakefield Mechanical Lubricator

BRANCHES

Toronto, Ont.

Winnipeg, Man.

Vancouver, B.C.

CANADA

Its uses are so many
that it is never idle.

BROWNHOIST Locomotive Crane

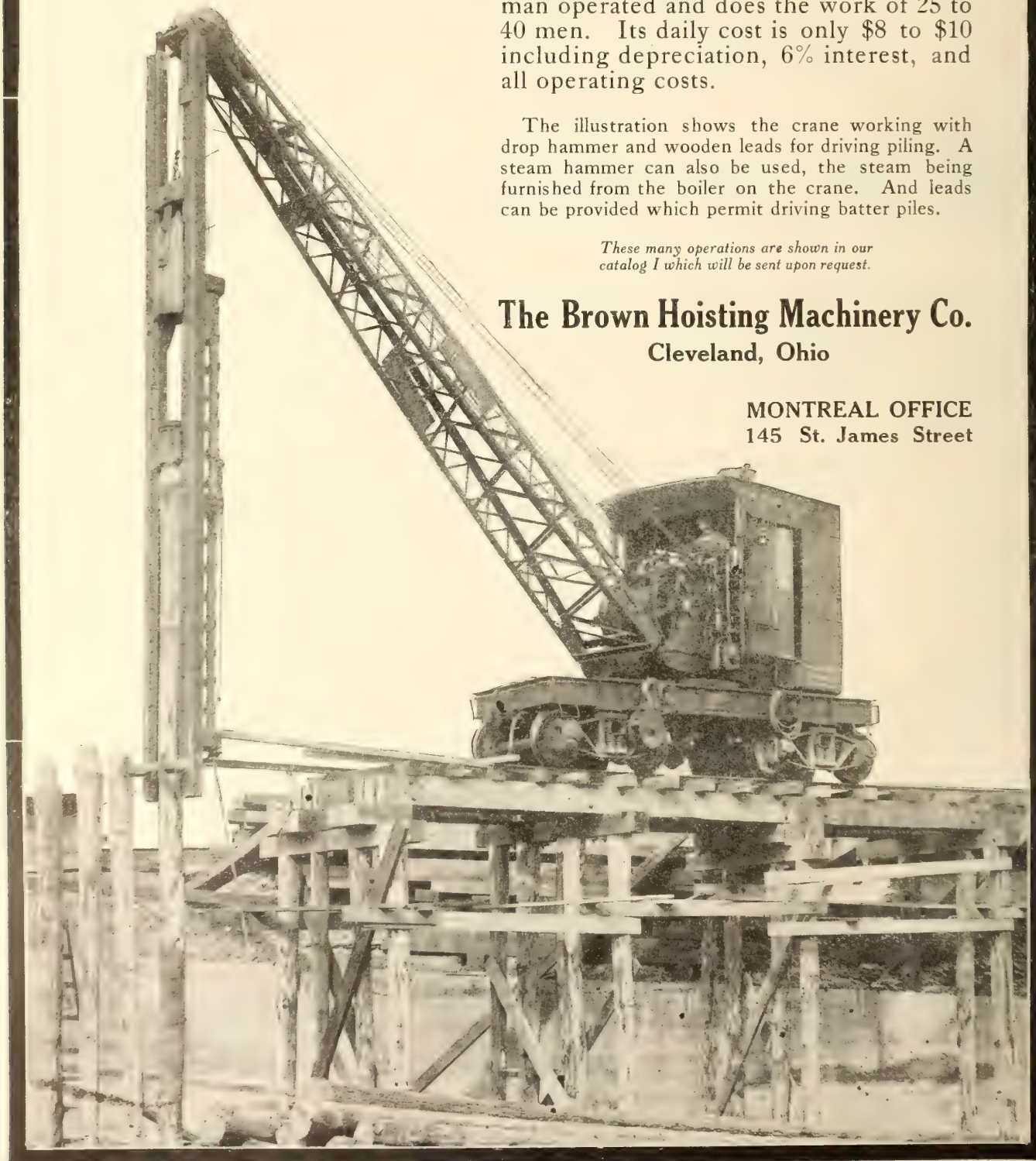
is used from start to finish on track construction work — excavating, filling in, driving piles, unloading ties and rails, and placing the ballast. The crane is one man operated and does the work of 25 to 40 men. Its daily cost is only \$8 to \$10 including depreciation, 6% interest, and all operating costs.

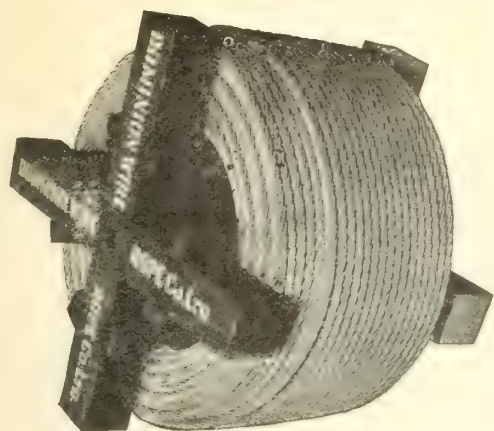
The illustration shows the crane working with drop hammer and wooden leads for driving piling. A steam hammer can also be used, the steam being furnished from the boiler on the crane. And leads can be provided which permit driving batter piles.

*These many operations are shown in our
catalog I which will be sent upon request.*

The Brown Hoisting Machinery Co.
Cleveland, Ohio

MONTREAL OFFICE
145 St. James Street





Increase Your Efficiency in Wire Rope Service

By ordering "Made In Canada" Rope
from our Warehouses in

Montreal, Winnipeg and St. Catharines

The Dominion **WIRE ROPE** Company, Limited
MONTREAL

Industrial Works Locomotive Cranes



STEAM, ELECTRIC AND GASOLINE

for Fast, Efficient Service

USED WITH A

GRAB BUCKET, HOOK, LIFTING
MAGNET OR AS A

Pile Driver

We give below an illustration of "MARION" Model 281

Excavator and Drag Line Machine

used on the Halifax Harbour Work

We can deliver you
Immediately from Stock
a duplicate of this

'Money Saving' Machine

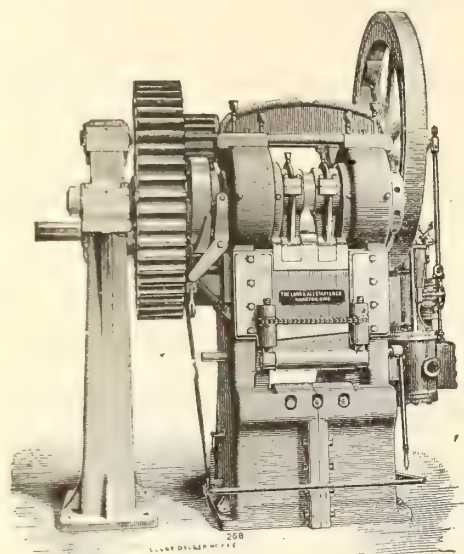


Branch :
St. Catharines, Ont.

F. H. Hopkins & Co

Head Office :
MONTREAL

Power Punching and Shearing Machinery



Gate Shear---Steam-Driven

Over 350 sizes and styles for all kinds of light and heavy work designed and manufactured by

The Long & Allstatter Co.

Hamilton, Ohio, U. S. A.

Riveting Machines Tire Welding Machines
Armature Disc Notching Machines
Tire Bending Rolls Beam Coping Machines
Bending and Forming Machines

Write for Catalogue if interested.

Correspondence invited.



Grand Trunk Hotels

The Chateau Laurier, Ottawa, Ont.

Accommodation 350 Rooms. Rates \$2.00 per day and upwards. European Plan.

The Fort Garry, Winnipeg, Man.

Accommodation 300 Rooms. Rates \$2.00 per day and upwards. European Plan.

The Macdonald, Edmonton, Alta.

Accommodation 250 Rooms. Rates \$2.00 per day and upwards. European Plan.

Write for illustrated booklets, sent on application to Resident Manager.

The Double Track Route

Provides

Service	Comfort
Safety	Courtesy
Speed	Convenience

Winter Tours to California and all Pacific Coast Points. Florida, Texas, New Orleans, Etc.

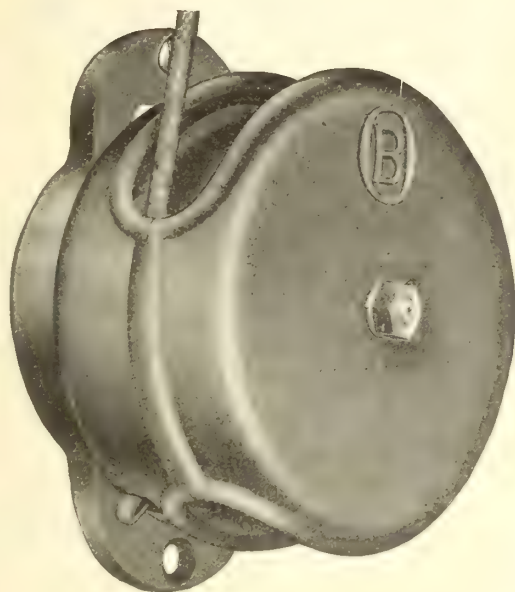
Winter Tours Tickets now on sale. Stop over privilege allowed.

The New Way West

Via the Transcontinental and Grand Trunk Pacific Railway affords new scenery, new interests. Write to any Agent of the Company for advertising matter, rates, and all particulars.

G. T. BELL,
Passenger Traffic Manager, Montreal

W. S. COOKSON,
General Passenger Agent, Montreal

**O-B Trolley Catcher**

Catcher or Retarder?

Do you use a Trolley Catcher that catches the pole or one that merely retards its flight?

In other words do you use an O-B Catcher or not?

An O-B Catcher quickly catches a wild pole and it stays caught.

The rebound is not sufficient to release its grip.

Its simple and rugged construction makes it trouble proof.

Fully described in Catalog No. 16

The Ohio Brass Company

Mansfield, Ohio

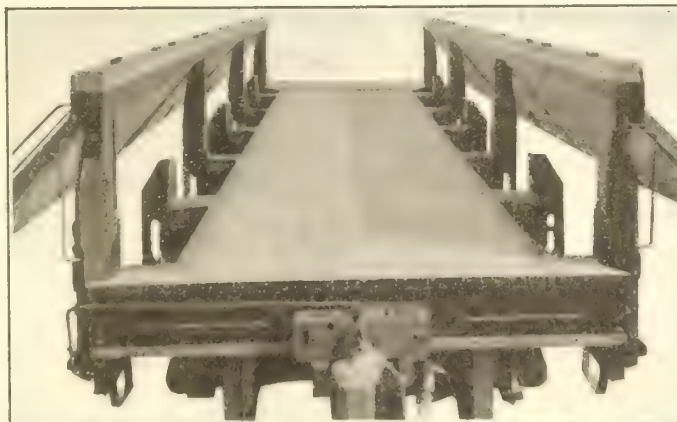
Side Ballasting With One Side Closed

The Latest in Ballast Cars

33 $\frac{1}{3}$ % More Door
Opening Area

Less Stakes to
Obstruct the
Dumping Material

No clogging of the
Material or Boulders
Between the Plow
and Stakes



Dumps Clean and
Quicker in Any
Material

No More Breaking
of Stakes or Cables

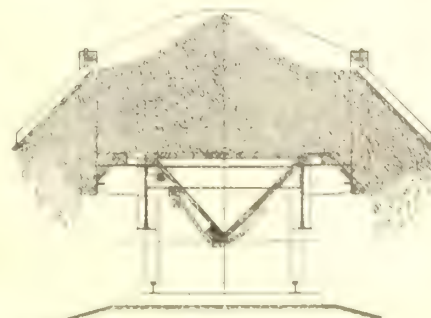
The Car That Will
Give Maximum
Service With
Minimum Repairs

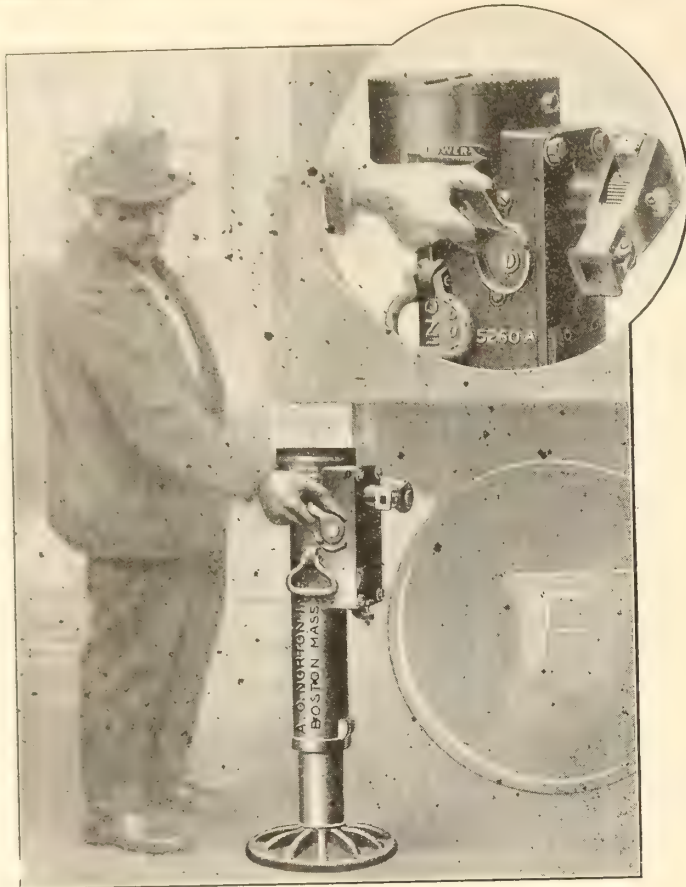
The Pockets At Each Side Allow
the Material to Get Away Relieving
the Car Side and Stakes of Strain.

ACTUAL SERVICE HAS PROVEN ITS EFFICIENCY
LET US SHOW YOU THIS CAR

DESIGNED, BUILT, AND PATENTED IN CANADA

The HART-OTIS CAR CO. Limited, MONTREAL





Don't Pump Your Jack Down

Lower the Load by "Pressing the Button"

The Norton Self Lowering Jack

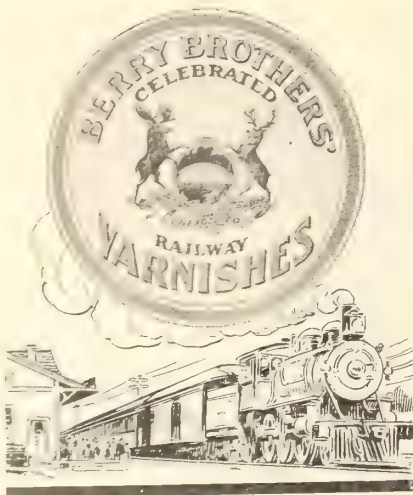
is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

Send for Illustrated Catalogue No. 28.

A. O. Norton, Limited
Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents :
MUSSENS LIMITED

Montreal Toronto Winnipeg Cobalt Calgary
Vancouver



Berry Brothers' Railway Varnishes

Represent Nearly 60 Years of Varnish Making Experience

Berry Brothers' extensive line of Railway Varnishes makes it possible for you to purchase the right varnish for any demand.

Here are a few finishes you should know.

Locomotive Black

A fossil gum varnish of the highest grade—for the best attainable finish on locomotives, tenders and valuable rolling stock, combines excellence with durability—efficient because its use is true economy—a case of the best being the cheapest.

Front End Black

For the front end of locomotives. It covers well, makes a handsome jet black finish, and stands a high degree of heat without injury.

Smoke Stack Black

Made especially for use on smoke stacks, producing a jet black and brilliant lustre, and resisting heat of a high degree without injury.

Let us send you a copy of our Railway Varnish catalog, just issued

BERRY BROTHERS
(INCORPORATED)
World's Largest Varnish Makers

WALKERVILLE

ONTARIO

RESULTS COUNT

That's Why 465 Railroad Shops Are Using Thermit

Thermit offers the only sure and reliable repair for locomotive frames and other heavy sections.

The superheated liquid Thermit steel is produced in bulk and poured all at once into a mold surrounding a broken section, resulting in the perfect amalgamation of the Thermit steel with the parts with which it comes in contact. The fact that those parts are first preheated, makes the weld doubly sure.

The operation of welding locomotive frames is easily accomplished, without removing the frame from position, and with very little dismantling, no matter if the frame be broken in the splice, jaw, next to the cylinder saddle, or at any other point. The engine is returned to service in from ten to twelve hours.

Hundreds of thousands of pounds of Thermit are being used annually by railroad companies in the United States and Canada.

There is only one reason for this, and that is that Thermit produces results and we all know that "results count."

Our pamphlet No. 2144 will be of interest.

All Thermit and Thermit appliances are made in our Canadian shops.

GOLDSCHMIDT THERMIT COMPANY

103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco

120 Broadway, New York

7300 So. Chicago Ave., Chicago



Scientific Treatment of Boiler Waters

Dearborn Service to Railroads

Twenty-five years devoted to the subject of water chemistry, embracing the analysis and successful treatment of waters in all parts of America, and in many countries of the eastern continent as well, including supplies used in locomotive, stationary and marine boilers of every type and size, and operated under the varying conditions that obtain in different industries, gives us a background of experience which is of value in handling new problems, and an assurance to our customers that only expert, efficient service will be offered them.

Scores of Railroads are using Water Treating Preparations compounded by us to meet their requirements, with great benefit to the railroad companies, in the increased life of the boilers, reduced consumption of fuel and lubricating oil, ability to haul greater tonnage, increased mileage between boiler washings, and generally improved operating conditions.

We would be glad to analyze the waters on districts where you are having trouble, and advise with you regarding treatment.

Dearborn Chemical Company of Canada, Limited

Office and Works : 1220-1230 Dundas Street, Toronto, Canada



PREPAREDNESS—Many of our customers have been applying large numbers, and in some cases complete installations, of Tate Flexible Staybolts to their locomotive fireboxes, and thus are prepared to handle the heavy business during the present season.

THE TATE FLEXIBLE STAYBOLT has been used quite extensively since 1904 in the locomotive fire boxes, and its service records all go to prove that it has done more to improve conditions of staying and preserve the life of the firebox than any staybolt so far used.

WE RECOMMEND THIS BOLT to the railroads of Canada and to all users of the firebox type of boiler where staybolts are necessary, with the assurance that it will be found strong, serviceable, economic and most effective in reducing staybolt breakage and firebox repairs.

OVER 16,000,000 BOLTS IN SERVICE.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

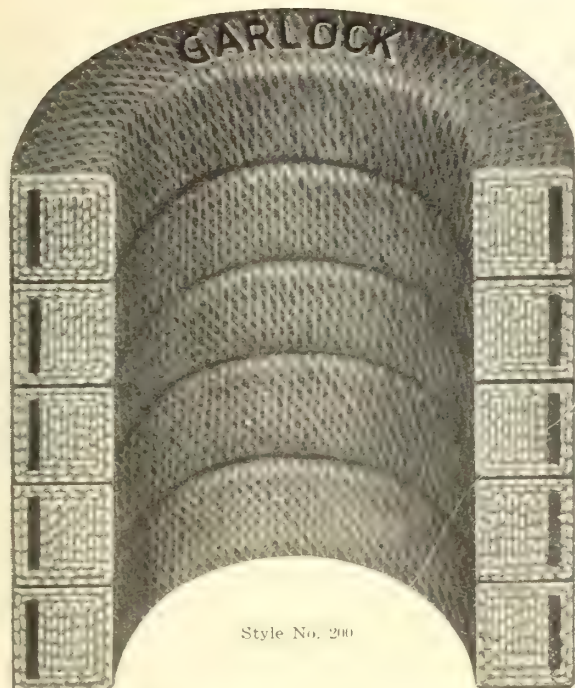
Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.

Modern High-Class ROLLING STOCK



Passenger, Freight
and
Electric Railway
Car Castings,
Forgings
and Repair Parts.

Crossen Car Company, Limited
Cobourg - Ontario



Style No. 200

Garlock High Pressure Piston Rod Packing

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.

THE GARLOCK PACKING COMPANY

- Hamilton, Ontario



Branches :

Montreal, Que., 342 St. James St. East Toronto, Ont., Continental Life Bldg.
Winnipeg, Man., Galt Building



CANADIAN STEEL FOUNDRIES LIMITED

**STEEL CASTINGS - MANGANESE STEEL CASTINGS
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK
BAR STEEL**

**GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
BRANCH OFFICE — TORONTO**

**WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL**

Nova Scotia Steel and Coal Co., Limited

Manufacturers of

MARINE, RAILWAY AND GENERAL ENGINEERING FORGINGS OF ALL SHAPES AND UP TO 40 TONS IN WEIGHT, MADE FROM BEST ORDINARY OR HARMET FLUID COMPRESSED OPEN-HEARTH STEEL. OUR FORGE IS EQUIPPED WITH THE MOST MODERN STEAM HYDRAULIC PRESSES.

RAILWAY TRACK MATERIAL, fish plate, tie plate, track bolts, spikes, tee rails—12 to 40 lbs. per yard.

ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

ALSO MINERS AND SHIPPERS OF THE CELEBRATED "OLD SYDNEY" COAL.
HIGH CALORIFIC VALUE—LOW ASH—UNEXCELLED FOR STEAM-RAISING PURPOSES.
BEST HOUSE COAL MINED IN CANADA.

Collieries, Iron and Steel
Furnaces:
SYDNEY MINES, C.B.

Coal Shipping
Piers:
NORTH SYDNEY, C.B.

Finishing Mills, Forge, and
Engineering Shops:
NEW GLASGOW, N.S.

INQUIRIES SOLICITED

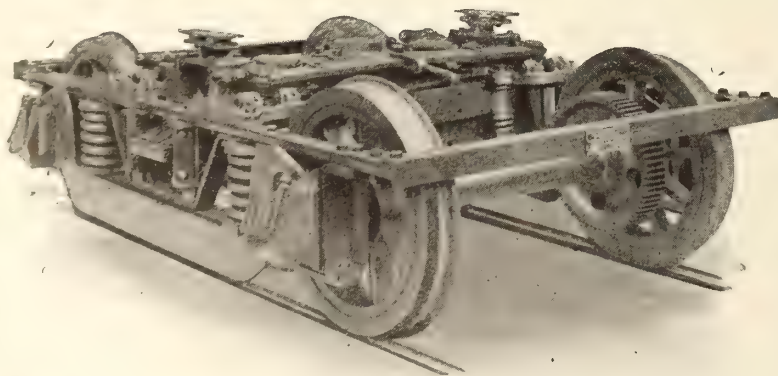
Western Steel Sales Office:
Room 14, Windsor Hotel,
Montreal, Que.

Western Coal Sales Office:
219, Board of Trade Bldg.,
Montreal, Que.

Head Office:
New Glasgow, N.S.

Canadian Baldwin Electric Trucks

Interurban Service



Canadian Baldwin Trucks, Class 84-30-AA, built for Lake Erie and Northern Railway, Ontario.

The truck illustrated is designed for high speed on electric railways, and has a rated carrying capacity of 30,000 pounds on the centre plate.

It has frictional side bearings and is of the equalized pedestal type.

Canadian Baldwin trucks, solve the problem of minimum weight, economical maintenance, simple construction, noiseless operation and easy riding.

There is comfort in riding on roads where Canadian Baldwin Trucks are used.

Manufactured in Canada by

Canadian Locomotive Company, Limited
KINGSTON, ONTARIO



How Many Hides
Has A Cow?

Two Sides to Every Hide

Like every question, every hide has two sides. If you know leather, and know the difference between No. 1 leather and split leather, you will specify the upper side; for that's the part of the hide that supplies the soft, pliable leather. The under side,—the flesh side,—furnishes the "splits." These splits, coated, embossed and colored often masquerade as No. 1 leather.



Fabrikoid is one material of different weights and colors, nevertheless it is basically the same; composed of a strong cotton cloth of different widths coated with a tough, flexible waterproof material; will not peel, crack, nor split and twice as strong as the average coated split.

For car upholstery, Fabrikoid is far superior to coated splits and costs less. Master Car Builders throughout the United States and Canada are specifying Du Pont Fabrikoid. Write for samples and convince yourself.

Du Pont Fabrikoid Company

Canadian Factory, Toronto, Canada

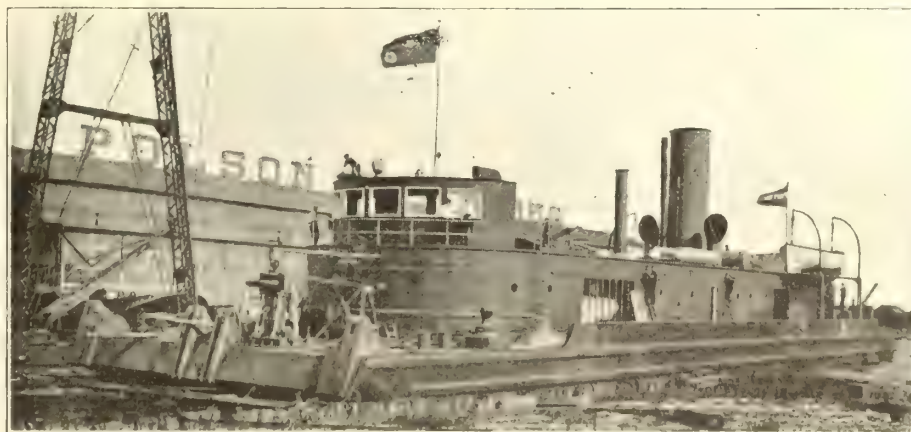
Du Pont Building, Wilmington, Del.

WENDELL & MacDUFFIE CO.

Railroad Department Representatives, 59 Broadway, New York

STEEL SHIPBUILDERS

Engineers and Boilermakers



24-inch Suction Dredge built for Canadian Government Harbor service on Hudson Bay.
This is the second largest dredge built in Canada.

Marine Engines and Boilers, All Sizes

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto



Canadian Northern All the Way

Between

TORONTO WINNIPEG EDMONTON VANCOUVER

With Connections to and from all points.

Freight

Passenger

Express

For all information apply to Company's Offices, 226 St. James St., Montreal, Que.,
68 King St. E., Toronto, Ont. or Union Station, Winnipeg, Man.

Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE—INTERCOLONIAL RAILWAY

Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

Montreal Locomotive Works, Limited

DOMINION EXPRESS BUILDING, MONTREAL, CANADA



MARTIN-SENOUR PAINTS AND VARNISHES



MADE IN CANADA

Marine Paint
Deck Paint
Hull Paint
Copper Paint
Seam Paint
Mast Paint
Dory Paint
Signal Paint
Smoke Stack Paint
Bunker Paint

The Martin-Senour line of Marine Paints and Varnishes is the most complete line manufactured in Canada.

There is a Martin-Senour finish for every purpose from stem to gudgeon. Each product guaranteed to best serve the purpose for which it is made.

Write for our Marine Catalogue and Color Chart

It's full of interest to the Marine Trade

Yacht Enamel
Engine Enamel
Canoe Enamel
Deck Furniture Enamel
Canvas Preservative
Railing Black
Ships Black
Durable Boat Spar Varnish
Boat Spar
Cabin Finish



The **MARTIN-SENOUR** *Go.*
LIMITED

PRODUCERS OF PAINTS AND VARNISHES

CHICAGO

MONTREAL

WINNIPEG

HALIFAX

LINCOLN

TORONTO



The following is a list of these Standard Counterbalanced Bucket Locomotive Coaling Plants, designed and built by Roberts & Schaefer Company, since the 1915 Coliseum Railway Show.

O. W. R. R. & N.	Spokane, Wash.
O. W. R. R. & N.	Pilot Rock Junction, Ore.
O. W. R. R. & N.	The Dalles, Ore.
Can. Nor. Ry. Co.	Big Valley, Alta.
Can. Nor. Ry. Co.	Kindersley, Sask.
Can. Nor. Pac. R. R.	Kamloops Junction, B.C.
Can. Nor. Ry. Co.	Hanna, Alta.
Can. Nor. Ry. Co.	Hornepayne, Ont.
Can. Nor. Ry. Co.	Rideau Junction, Ont.
Can. Nor. Ry. Co.	Capreol, Ont.
L. & N. R. R.	Lexington, Ky.
T. & N. O. Ry.	Porquis Junction, Ont.
C. G. W. R. R.	Clarion, Ia.
C. G. W. R. R.	Council Bluffs, Ia.
C. G. W. R. R.	Hayfield, Minn.
L. & N. R. R.	Pensacola, Fla.
N. C. & St. L. Ry.	Cowan, Tenn.
Penn. R. R.	Canton Yard, Baltimore, Md.
N. C. & St. L. Ry.	Cowan, Tenn. (Rands Gravity Sand Plant.)
D. M. & N. Ry.	Proctor, Minn.
C. & O. Ry.	Paintsville, Ky.
D. M. & N. Ry.	Proctor, Minn. (Rands Gravity Sand Plant.)

This is a construction record equalled by no other company.

ROBERTS AND SCHAEFER CO.

ENGINEERS AND CONTRACTORS
CHICAGO, U.S.A.

LATER

We have just received contracts for 7 more Coaling Stations.

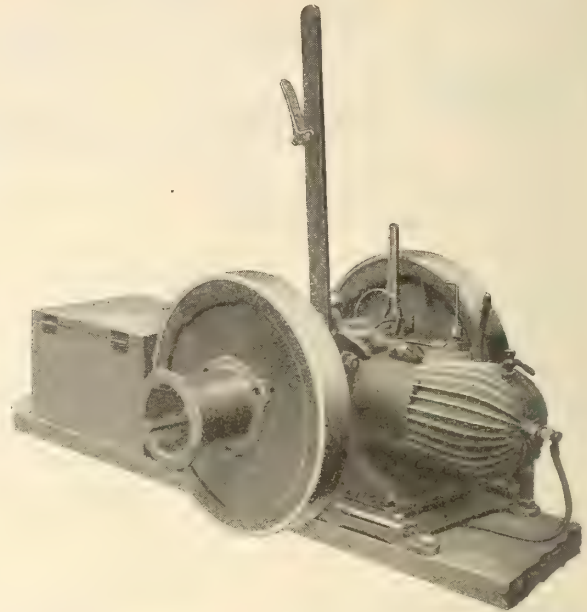
The Air Cooled Jack Canuck Section Man's Engine

Fitted with Air Cooled Cylinder which materially reduces the weight and makes it absolutely reliable under all conditions of weather.

The Air Cooled Jack Canuck is a kerosene engine—a vital consideration with gasoline at the present high prices.

Terms liberal—\$10.00 with the order.
\$10.00 per month until paid for.

Write now for particulars.



The Canadian Fairbanks-Morse Co., Limited

MONTREAL, QUEBEC, ST. JOHN, OTTAWA, TORONTO, HAMILTON, WINNIPEG,
SASKATOON, CALGARY, EDMONTON, VANCOUVER, VICTORIA



The Culvert Most Railways Prefer and Use

for most purposes, must be an unusually satisfactory culvert and such is

PEDLAR'S **"PERFECT"** **TONCAN** **METAL** **CULVERTS**

Most railways, municipalities and engineers prefer it for its strength, its defiance of decay, its saving in time and cost of erection. Made from **TONCAN** that cannot crack or rust or corrode. Supplied in all sizes from 8 in. to 84 in. in diameter and shipped assembled up to 40 feet.

Don't have any doubts in your mind as to the most serviceable and economical culvert. Write for the Culvert Reference Book No. 4 R.M., and decide the matter right now. The book is free. Shall we send it?

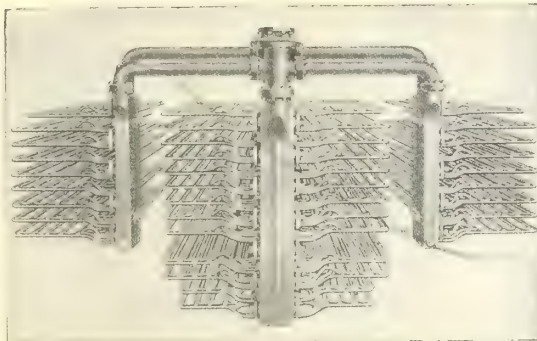
THE PEDLAR PEOPLE, Limited
(ESTABLISHED 1861)

Executive Office and Factories, OSHAWA, ONT.

Branches : MONTREAL OTTAWA TORONTO LONDON WINNIPEG

Fire Tube Marine Superheater -- Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler h.p. from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, New York, N.Y.

Peoples Gas Bldg., Chicago, Ill.

Algoma Steel Corporation, Limited

Manufacturers of

Steel Rails, Splice Bars, Tie Plates, Forging Billets, etc.

We would be pleased to have your enquiries for 1916 deliveries.

Works and Sales Department: Sault Ste. Marie, Ontario, Canada

The Light of Day on the Right of Way

Headlights

Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

Car Lighting

Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency with economy. Standard cylinder supplies from one to two months' lighting of the average car.

Signals

Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

Commercial Acetylene Railway Light and Signal Company

103 BAY STREET, TORONTO

Main Office, 80 Broadway, New York

Branches, Atlanta, Boston, Chicago, San Francisco

American Flexible Staybolts

Manufactured in Montreal



Made of the best standard staybolt iron, adding flexibility by process of making as shown above---closely approximating a rope structure.

Write for booklet on subject.

TAYLOR & ARNOLD, Limited
MONTREAL WINNIPEG

Jas. W. Pyke & Company, Limited

Iron, Steel and Metal Merchants

Locomotive, Driving, Engine and Tender Truck Axles, Passenger, Freight, and Electric Tram Car Axles—To Standard or Railway's own Specification.
Staybolt and Engine Bolt Iron—Quality and Service Unexcelled.
Steel Plates—Firebox, Flange and Tank Qualities.
Structural Shapes—Beams, Channels, Angles, Tees, Zees, etc.
Steel Billets and Forgings—of all descriptions.
Locomotive Boiler and Superheater Tubes—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
232 St. James Street,

Montreal

A Land of Re-Creation

The SUMMERS from May to October in Eastern Canada are probably as enjoyable as those in the most favoured part of the world that may be chosen for comparison.

Sea-Shore, Forest and Stream

Sunny skies, delightful temperature, invigorating air, combined with an endless variety of picturesque beauty, the Maritime Provinces are becoming more and more what nature evidently intended they should be—a land of Re-Creation.

Write General Passenger Department

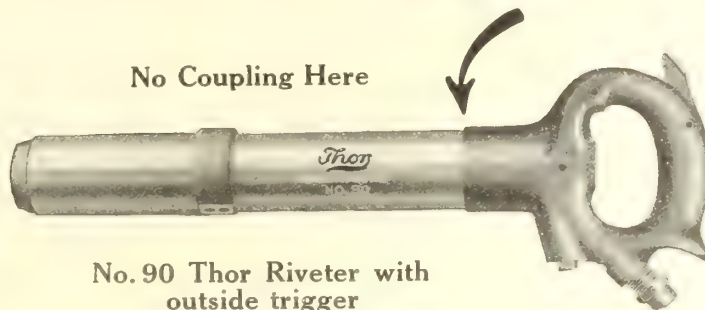
Canadian Government Railways

Moncton, N. B., for 1916 Publications

Thor

One Piece Pneumatic Long Stroke Riveting Hammer

No Coupling Here



Made from a solid drop forging with no connection between barrel and handle. Positively no leakage of air.

No. 90 Thor Riveter with outside trigger

Most powerful, durable and economical hammer on the market. Especially adapted for marine work. Used by most of the leading shipyards.

Furnished on Trial—FREE.

Independent Pneumatic Tool Company

334 St. James St., Montreal, Que.

Buffalo Brake Beam Company

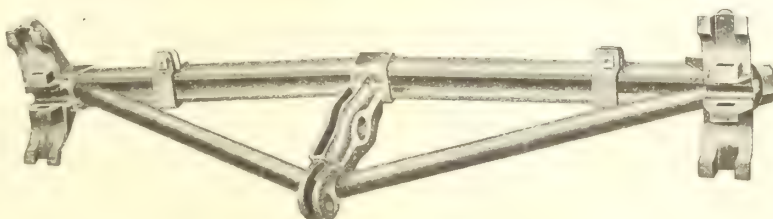
BUFFALO BEAMS ARE BEST BEAMS

Offices:

NEW YORK
30 Pine Street

ST. LOUIS
Syndicate Trust Bldg.

MONTREAL
195 Commissioner St.



Works:
BUFFALO,
N.Y.

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment



The Star Brass Works

Largest Exclusive Trolley Wheel Makers in the World.

Kalamazoo

Michigan



Canada Iron Foundries, Limited

Chilled Tread Cast Iron Car Wheels for All Services
Cast Iron Water, Gas and Culvert Pipe,
Flanged Pipe and Specials
Railway Castings

HEAD OFFICE :

Mark Fisher Building

-

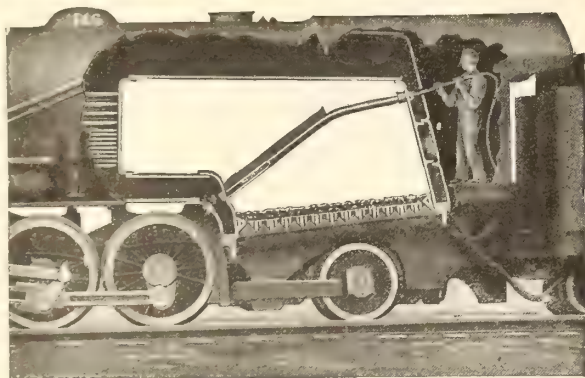
-

-

Montreal



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes.

Lagonda Arch Tube Cleaners

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

Other Lagonda Boiler Room Specialties are described in our General Catalogue L-8. Send for Copy.

Babcock and Wilcox, Limited

Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Building

The Parmelee Pipe Wrench



Price List C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	3/4, 1, 1 1/4, 1 1/2, 2 in.	\$5.00	\$2.25	3/4, 1, 1 1/4, 1 1/2, 2 in. \$.75
20 in.	2 1/2	1 1/4, 1 1/2, 1 3/4, 2 in.	7.50	2.50	1 1/4, 1 1/2, 1 3/4, 2 in. 1.00
25 in.	3 1/2	1 3/4, 2, 2 1/4, 2 1/2, 3 in.	7.50	3.00	1 3/4, 2, 2 1/4, 2 1/2, 3 in. 1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Limited

Toronto, Canada

"The Toothless Wonder"

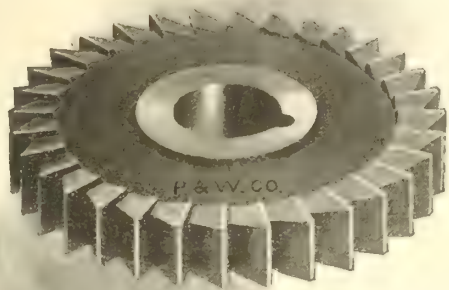
Designed Especially to handle pipes spaced closely as in coil work. No. 2 1/2 wrench illustrated requires but three-quarter inch space between pipes.

Positive Grip instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

Ratchet-like Action. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

Can't Chew. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

Can't Crush. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.



Milling Cutters

TAPS—DIES—REAMERS—DRILLS

MADE
IN
CANADA

—BUT—

SOLD
ON
MERIT

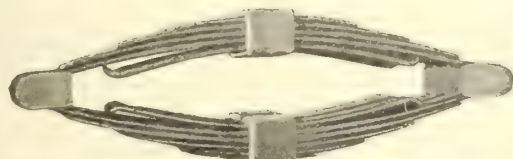
Pratt & Whitney Co. of Canada, Ltd.

DUNDAS, ONTARIO

Montreal

Vancouver

Winnipeg



No. 75—DOUBLE ELLIPTIC SPRING
With Reinforced Leaves and Cast End

Railway Springs

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.

EQUALIZING, DRAWBAR, BUFFER AND SPIRAL SPRINGS of all kinds.

STREET RAILWAY SPRINGS, from the largest to the smallest.

TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE SANDERS, CHAIN, Etc.

Manufactured by

B. J. Coghlin Company, Limited
Montreal, Canada

Dominion Iron & Steel Co., Limited

Manufacturers of

Basic Open Hearth Steel Rails

We will be pleased to have your enquiries for 1916 shipments

Head Offices
and Works

Sydney, Cape Breton, Canada



In buying Rubber Supplies manufactured by the Canadian Consolidated Rubber Co. Limited, you are not only getting a **“Made in Canada”** product, but you are assured every advantage of price and quality that modern manufacturing conditions can possibly produce.

This Company is the oldest and largest rubber manufacturing concern in Canada, and, for scores of years has paid particular attention to the making of Rubber Specialties for Railway and Marine use.

Our stock is complete, our qualities are the best, and our prices are right.

Canadian Consolidated Rubber Co., Limited
Montreal, P. Q.

28 “Service” Branches Throughout Canada.

Canadian Railway and Marine World

June, 1916.

The Outside Frictionless Rail for Curves.

By W. P. Chapman, M.Can.Soc.C.E., Bridge Engineer, Eastern Lines, Canadian Northern Railway.

The wheels of a locomotive or car mounted on rigid axles, when rounding a curve tend to travel on a tangent to that curve, but are prevented from doing so by the flange of the foremost wheel coming in contact with the gauge side of the outer rail. This obstruction retards the progress of the outer wheel and momentarily allows the inside wheel to gain in distance until the back flange of the inner wheel is forced against the gauge line of the inner rail; then develops the maximum resistance in friction on curves. The inner flange in traversing the inside rail meets with no resistance to its progress from that rail except of a secondary character, the friction being first developed and transmitted from the forward edge of the front wheel traversing the outer rail. This at first permits the inner wheel to get slightly ahead of the outer wheel, until the inner flange is forced against the inner rail. It should be noted here, that the flange of the outer wheel first meets obstruction several feet in advance of the back flange of the inner wheel of truck, but the inner flange meets with no obstruction to its progress until after the former has been transmitted to it in a secondary way. The inner wheel having the lesser distance to travel, it is obvious it should be slightly retarded rather than relieved of friction. If we keep the two wheels directly opposite each other continually, and the axle at right angles to tangent of curve, the friction due to curvature is practically eliminated, provided the proper superelevation is given to overcome centrifugal force. To illustrate, we will take a 4 degree curve about 1,400 ft. long. The exact distance the outer wheel will travel is 1,409 ft., that of the inner wheel 1,404 ft. Now it is clear that if these wheels are on a rigid axle the inner wheel must either slip and lose, or the outer must jump and gain, 5 ft. in distance. It is this compensating movement on rails of same area which causes most of the friction on curves over that of the tangent.

The width of head of a standard 80 lb. rail is 2 9/16 in. With two such rails laid to standard gauge on a tangent the adhesive resistance of each should be practically the same. For our present purpose we will assume that with equal surfaces the adhesive resistance will be the same for curves. It follows that some compensating action must take place to enable the outer wheel to keep pace with the inner wheel. This is accomplished either by a slipping movement of the inner wheel, or a jumping forward of the

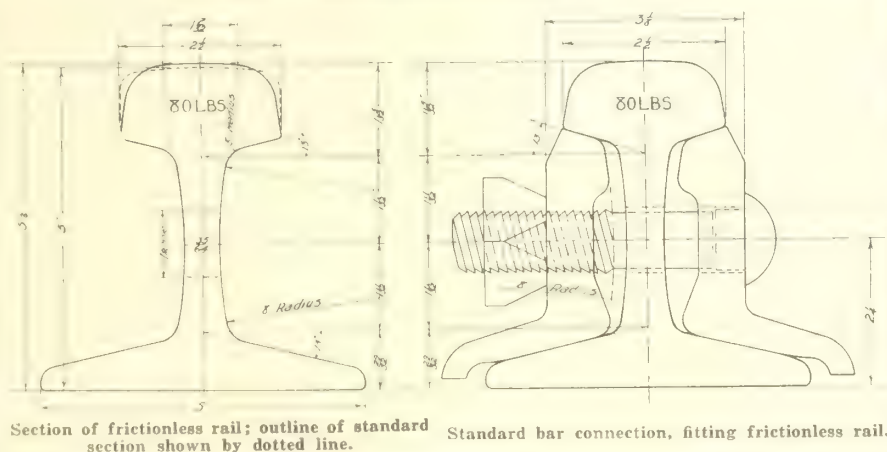
outer wheel. Investigations have been made, the results of which make it quite feasible to practically eliminate this most difficult feature of friction due to curvature. The solution is known as the frictionless rail. This frictionless rail is a section of same weight as the standard sections, designed to meet the exigencies of the case, covering all sections, and being quite equal to the physical requirements of the companion rail, the main features being a narrower head, giving less surface to tread of wheel; a flat, rounded gauge line, and angular side to reduce the contact surface against the flange of outer wheel. It is slightly higher than the standard section, to permit of the use of the standard or usual fishing plate or bar. At points where it joins the standard rail a slight modification of the fishing bar may be necessary.

The advantages of the frictionless rail

on the rail, meets with just a little more resistance to its revolution, tending to retard its progress. This retarding, or slip, of the inner wheel, is sufficiently uniform and effective to keep the wheels opposite each other, with the axle on a line at right angles to tangent of curve, provided of course the superelevation is not neglected. These two influences working in conjunction effect a balance or compensating action upon each pair of wheels, the result of which is that each axle will under ordinary conditions tend to traverse a curve on radii lines.

From the foregoing it is clear that the outer frictionless rail, to develop the desired results, must have, as a companion or inner rail, one with a greater area for wheel contact; in other words two rails of similar section will not permit that compensating action which gives the desired results. Further, rails on tangent or the

inside of curves, with track conditions good, wear horizontally, and do not show a great percentage of wear on the upper corner of head, nor at the gauge side, but they they do invariably show that much of the upper corner of rail-head is worn off the outer rail on curves. This is done by the forward edge of flange and not by the collar of wheel. The design of the outside frictionless rail for curves, in addition to reducing the horizontal contact surface, also reduces the projecting angle of head,



will be to eliminate friction due to curvature on train loads, also on locomotives, thereby greatly increasing the hauling capacity of the latter on sharp curves, and further reducing the number of rail breakages, as returns show conclusively that the number of rail failures is nearly 100% higher on curves than tangents. It will also reduce to some material extent, compensation for grades on curves—thereby reducing the cost of construction of railway.

This frictionless rail is laid outside the curve to the customary gauge with its companion rail of the standard section. As previously described, the outer wheel in traversing a 4 degree curve revolves or jumps over 5 ft. greater distance than the inner wheel. It is clear then that the object should be to remove every obstacle in the way of friction that would in any way retard the movement of this wheel. This is accomplished by decreasing the contact area of the top of outer rail, allowing the outside wheel to perform its ordinary revolutions with less friction, and gain slightly over its companion wheel on the same axle. The inner wheel, having a greater grip or contact surface

which in the standard rail offers the greatest obstruction to the revolution of the outer wheel. Briefly, this frictionless rail is a new design—applied to a new purpose, to accomplish new and much desired economic results.

It is not necessary to go with minute details into calculations to show the exact theoretical friction or adhesion to overcome, as no two trucks are exactly the same, neither are the speeds uniform; and with other varying conditions of weather etc., it would be impossible to work out theoretical formulae to meet all conditions. Suffice it to say that the fundamental principles, if followed as outlined, will, it is confidently expected, overcome in a great measure and in an economical way one of the greatest difficulties railway companies have so long had to contend with, in that most obstinate feature, friction on curves.

The accompanying sketch shows a section of 80 lb. frictionless rail, the other sections being designed in accordance.

The writer has not considered it necessary to recognize the effect of coning on wheels, as investigations show this to be an uncertain factor and only temporary.

Ticket Salesmanship.

By A. G. Richardson, District Passenger Agent, C. P. R., Winnipeg.

Successful salesmanship is based upon an intimate knowledge of human nature. The main thing for a salesman to know is how to get along with people. As a general rule, a great deal depends upon the amount of interest you show in each transaction; especially in planning long-distance trips.

Selling railway tickets is as important as selling boots and shoes, or any other commodity. You never heard of a salesman selling one boot or one shoe—that's what you do when you fail to sell a round trip ticket, if the purchaser intends to return. Selling round trip tickets not only protects your company's revenue, but saves soliciting at the other end. In the ticket business, efficiency means securing the greatest amount of revenue possible from each transaction.

The best way to organize your office staff is to hold schools or council meetings regularly. Hold them evenings. Exchange ideas. Make the meetings informal and discuss different subjects, for instance: "Salesmanship," having one member of your staff act as salesman and another as purchaser. Other subjects, "Organization," "Filing System," "Tariffs," "Routes" and "Fares." In the larger cities, invite your rate clerk to attend and discuss questions pertaining to his department.

Greet every customer as soon as he comes in; call him by name, if you can. Many customers are lost by not being politely accosted when entering an office. Often a customer comes to the counter to secure a folder or to ask the time of a certain train and you can wait upon him at once without offending the first customer. If you have shown the right interest he will not object to the interruption. If you find it will take some time to wait upon the second customer, you can say, "In a moment," and go back to the first customer.

A dissatisfied customer may divert revenue amounting to many times your salary. In dealing with a patron of the company, one discourteous word from any employee will throw out of gear the entire machinery for securing his future business.

Honesty in all your dealings goes without saying—but that's not enough. Add energy, courtesy and common sense. Common sense is the keynote of good salesmanship.

Customers like to be waited on by well-appearing, clean clerks. Clean faces, clean hands and finger nails, well-kept hair, clean linen and boots, have as much to do with good appearance as good clothes.

Take care of your health. Energy is the salesman's greatest asset. You can't be energetic without having good health. Outdoor walking is one of the best means of preserving your health.

Every railway company has its own advantages. Get from the engineering, operating, or publicity department some interesting facts and talk them up. Railways spend millions of dollars on improvements, equipment, taxes, etc., and the public hear little about it. Over \$108,000,000 has been invested in block signal systems in Canada and the United States. The railways of Canada and the United States spent over \$10,000,000 in newspaper advertising last year. The railways pay over \$140,000,000 in taxes every year. There are approx-

imately 1,900,000 railway employees in Canada and the United States.

All employees of the same company must pull together. Wherever there is friction there is loss. Every employee of the company has some good ideas and cooperation will bring them out. Even the office boy has his point of view. Cooperate with employees of other departments. Ask them to advise you when they hear of anyone making a trip, and solicit the business.

Without loyalty all the other qualifications are worthless.

Keep a record of your clients' names and addresses and their favorite summer and winter trips. When you have suitable literature or circulars use this record as a mailing list. In the larger cities these names can be separated under different headings, such as: "Society," "School Teachers," "Atlantic Coast," "Pacific Coast," "Southern Destinations," etc.

Conditions of travel are continually changing—new rail and steamship lines are opened up; new train services are inaugurated—and the public expect you to be up to date.

You should be an important factor in your community and help to ensure a friendly feeling between your company and the public. This feeling must exist, both for your own benefit and for the benefit of the company you represent.

Before long ticket "clerks" will be out of fashion and railway companies will employ only ticket "salesmen."

The foregoing is copyrighted and is reproduced by Mr. Richardson's permission.

Advice to New Trainmen on the Grand Trunk.

The following leaflet, headed, "To the new man," has been issued over the signature of Howard G. Kelley, Vice President, G.T.R.:

Your success in the service you are about to enter will depend upon the care you exercise in the discharge of your duties. The best record you can make, both for yourself and for the company, is the record of a considerate and careful man. There are engineers, conductors and others who have worked for the Grand Trunk from 20 to 30 years without receiving injury themselves or causing injury to a single one of their fellow employees. Everybody respects the man who can make that kind of record. If you are the right kind of man—and we believe you are—you desire to become one of these honor men. One fact we want to impress thoroughly upon your mind at the beginning is this: The Grand Trunk Railway does not want anyone in its service to take an unnecessary chance in the performance of his duties for the sake of saving time, or for any other reason. We say this because experience has shown that taking chances is the worst kind of bad business both for the employee and for the company. Mutual protection, therefore, makes necessary compliance at all times with the following safety precautions: Never go between moving cars for any purpose. If the coupling apparatus should fail to work, thus making it necessary to go between, stop the cars before doing so. Never attempt to adjust drawbar with

foot, or, in other words, don't kick a drawbar to make coupling. If they don't make the first time, pull ahead and try again.

Never get upon an approaching engine or car from a position between the rails.

Don't ride on pilot of an engine except when absolutely necessary in the performance of your duties, and then be sure to keep a firm hold to prevent falling.

Where permissible in the performance of your work, ride on footboard at the following, instead of the advancing, end of engine.

When necessary to open knuckle in order to make coupling, open knuckle on the standing car, instead of the moving car where permissible, and do so when the moving car is a safe distance away—at least one car length.

When necessary to open knuckle on moving car, do not step between rails to do so, and do not attempt it except when the car is moving at slow speed.

Never go under engine or train, or get in a position whereby injury would be caused by movement of equipment, without first being sure that the other members of the crew, especially the engineer, know where you are and what you are doing.

In riding on the side of a car, place the foot in stirrup, or on grab iron, and keep the body erect and close to side of car. Do not ride with foot on brake beam or oil box.

Look out for cars before crossing any track, and especially when about to step upon a track after going behind cars or other near by obstructions.

When sent out to flag, remember that others are entrusting their lives with you. Be sure to go back far enough, and never sit down while on duty as a flagman. Be sure that you are provided with all equipment required for flagging, and that the same is in position and condition for immediate use.

Make it a practice to read and understand all train orders received by your engineer or conductor.

Report to the proper person every unsafe condition or method which may come to your notice in order that correction may be made before, instead of after, someone has been injured.

Conditions may arise in connection with your duties concerning which you, as a new man, may require information and explanation. When you find such to be the case, do not hesitate to ask. Many a beginner has got into trouble by trying to conceal his lack of knowledge. You will find the older men in the service quite willing to help you.

Make yourself thoroughly familiar with the Book of Rules. It represents the best methods of railway operation which we have yet been able to devise as a result of years of study and experience by the most competent men in the various branches of the service. Remember that every rule in the book exists because experience first showed such rule to be necessary, and that you will be expected to comply with the rules—all of them—and not just those you may think you ought to comply with. You should find a study of the history, reason for and construction of the rules a most interesting, as well as profitable, study.

Australian Made Rails.—Steel rails, which it is stated compare favorably in workmanship, composition and tests, with those of other countries, are being made in Australia, the first supply having been made for the Victorian Railway Commission.

Railway Mechanical Methods and Devices.

Drip Pans for Drill Presses in Grand Trunk Shops.

Where cutting compound is used on drill presses, the surrounding floor area is usually very soggy from the escaping liquid flowing over the floor. This is not only disagreeable from the aesthetic standpoint, but is also most wasteful of the cutting compound, which under these cir-



Drip Pans for Catching Drilling Compound Under Drill Presses.

cumstances can only be used once, barring what is often saved in small pans placed directly under the work, and which must be emptied from time to time. This latter process is not usually very economical.

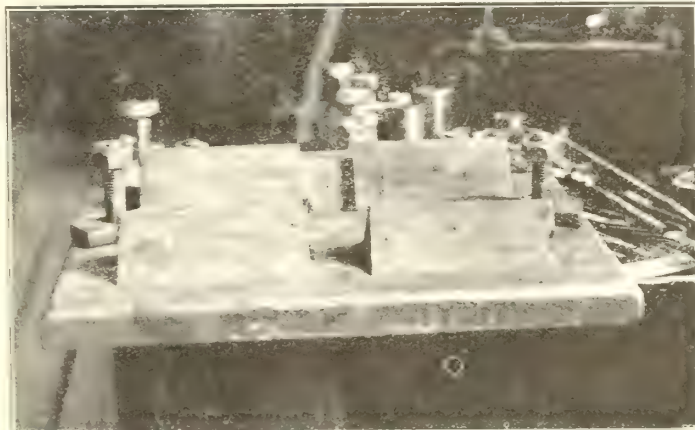
The G.T.R. shops at Stratford, Ont., have in use a complete system in the drill press section for catching this compound and reclaiming it, which is so simple in character as to appeal to practical shop men. A typical installation is shown in the accompanying illustration. On the bed of each drill press there is a small cast iron pan, let into the face of which is a sheet iron grating. On this latter all the cuttings, and liquid from the table drop, the cuttings draining the compound through the grating to the pan below. This drainage also carries through small cuttings and dirt, and in consequence, in order to make the latter a settling basin as well as a catch, an outlet pipe is let into the side as shown, about 1½ ins. above the bottom. Through this pipe, the clarified liquid, after the settling, drains off to a catch basin under the floor, several such pans draining to the one basin. From this central basin, the liquid is pumped up again to the main system for further use, only a very small amount being wasted, such as that which is carried off on the work and by evaporation.

The Railway Signal Association held its regular meetings at New York, May 24 and 25, when the general committee reports were dealt with, and also the report of a special committee on the harmonization of specifications for electrical requirements. A preliminary report on standard marking or numbering of relay posts was also considered, on presentation by a special committee on electrical testing.

Japanese laborers and minor mechanics from the Pacific Division have been moved east by the C.P.R., to work in shops and locomotive houses, owing to the scarcity of men.

Straddle Milling Tender Axle Boxes in Grand Trunk Shops.

The sides and faces of tender axle boxes are straddle milled at one pass in the G.T.R. shops at Stratford, Ont., the jig in which this is performed being shown in the accompanying illustration. The jig consists of a cast iron base, with projecting tapered blocks on the upper

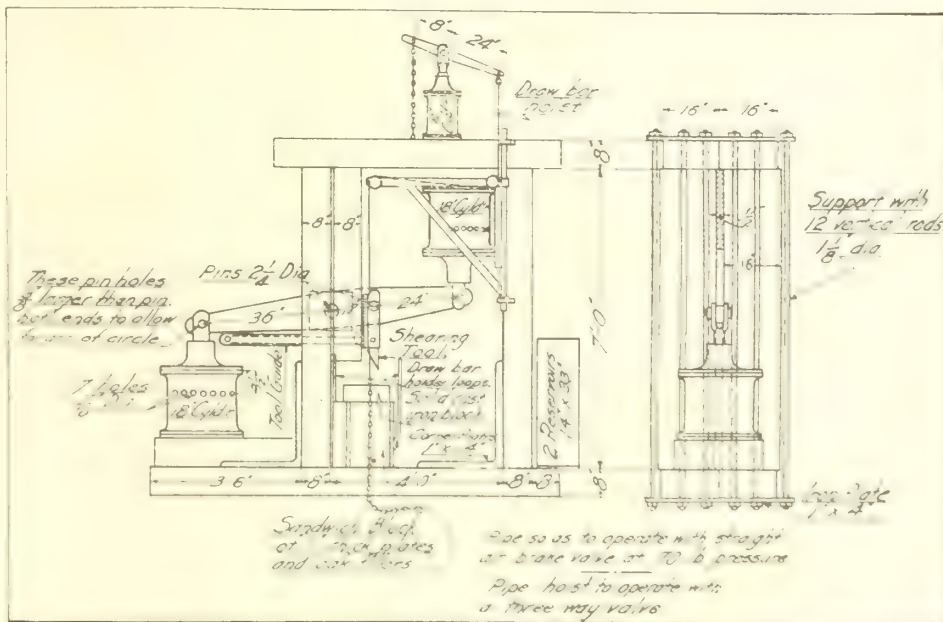


Jig for Straddle Milling Tender Axle Boxes.

A very useful device for separating drawbars and thimbles from tailstraps is used by the Canadian Northern Ry. and consists primarily of a stirrup frame with anvil block and air cylinders connected through multiplying levers to the shears as shown by the accompanying illustration.

surface, machined to the outside shape of the axle boxes. The under face of the jig is ribbed to fit the milling machine table, to which it is attached by two bolts. Each jig will take two boxes, these being held in place by clamp strips. A

tion. Two main cylinders one 16 in. and the other 18 in. in diameter operate the shear levers and develop an approximate force of 36,000 lbs. at the point of contact with the levers, and 110,000 lbs. at the shears, this with an extreme travel of 4



Drawbar Rivet Shearing Machine.

combination milling cutter is used on the horizontal milling machine.

Railway Lands Patented. — Letters patent were issued during March in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Aeres.
Calgary & Edmonton Ry.	2,080.00
Canadian Northern Ry.	9,692.26
Grand Trunk Pacific Ry.	505.30
Grand Trunk Pacific Branch Lines Co. . .	59.97
Qu'Appelle, Long Lake & Saskatchewan Rd. & Steamboat Co.	3,204.00
Total	15,541.53

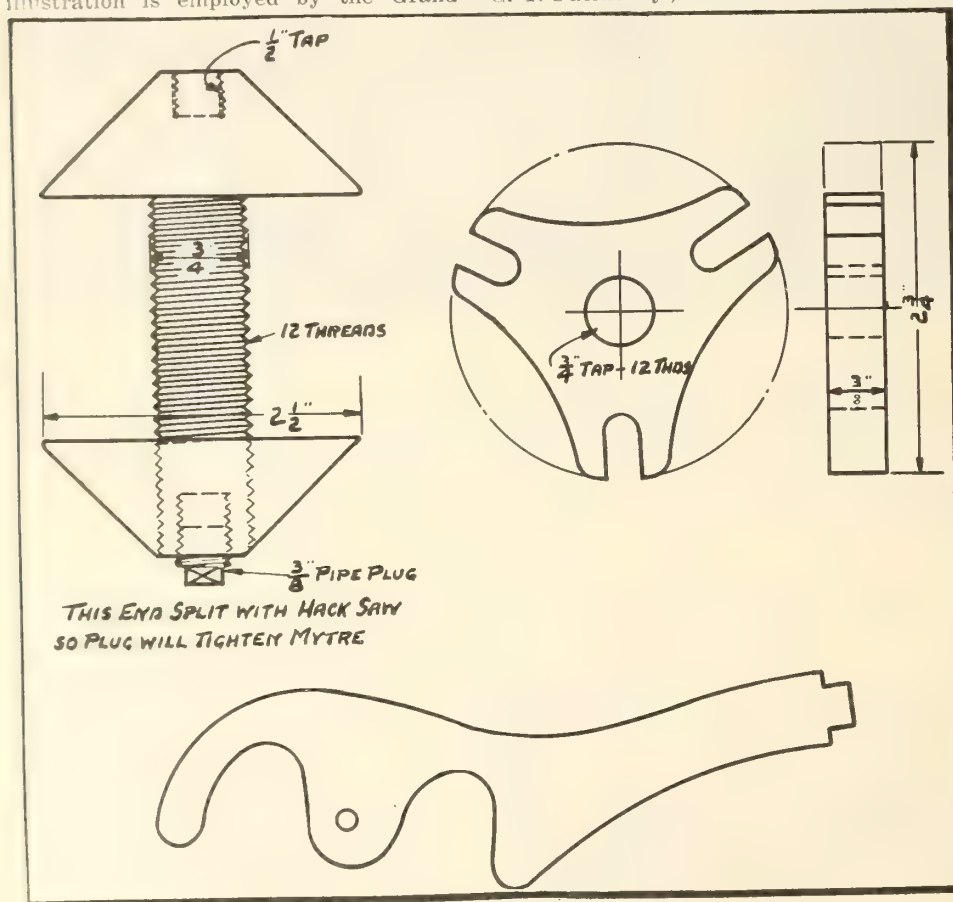
ins. The air pressure is regulated by a locomotive feed valve at 80 lbs. pressure per square in. On top of the frame is placed an 8 in. cylinder forming a lifting medium for use in placing drawbars. A solid cast iron base block is used and all drawbars are securely fastened in place for the shearing operation. The operating cylinders are cushioned when passing on the up stroke, so that there may be no possibility of pistons striking the heads violently. This is accomplished by drilling a row of 7/16 in. diameter holes 3½ ins. from the non pressure head, so as to rapidly release the air when the piston

passes this point, diminishing the operating pressure in the cylinder.

The operation of the machine is controlled from an engineman's brake valve, which is so placed as to force the shears down slowly on the drawbar rivet when the handle is in running position. In full release position the shearing effect is a maximum and to release the handle is placed in emergency position. It has been found possible to handle 60 drawbars a day by two men. We are indebted to T. Clegg, Air Brake Foreman C.N.R., for the above information.

Ring Centering Jig on Grand Trunk Pacific.

The device shown in the accompanying illustration is employed by the Grand



Ring Centering Jig.

Trunk Pacific Ry. in its shop at Wainwright, Alta. Its chief use is that of holding various styles of small joint rings, used for valve stems and glands, as well as those for front end steam pipes, dry pipes and headers, which require grinding to finish. Its range is from small rings of valve stem gland packing to those of front end steam joint rings. It will hold rings either from the inside or outside. It is centered and true as soon as the feet grip the ring. By turning the leg carrier up and down on the spindle the feet are spread or contracted.

It was developed by W. W. Yeager, now Locomotive Foreman at Biggar, Sask., when he held a similar position at Wainwright, Alta.

Scotch Railway Rates Increased.—The Caledonian and North British Railways have raised their rates from all their stations to other stations in Scotland, to the maximum, less 10%, where the maximum rates are not already in force.

Birthdays of Transportation Men in June.

Many happy returns of the day to:—
Jas. Anderson, Manager, Sandwich, Windsor & Amherstburg Ry., Windsor, Ont., born at Ayr, Ont., June 20, 1851.

F. F. Backus, Assistant to President, Toronto, Hamilton & Buffalo Ry., Hamilton, Ont., born at Rochester, N.Y., June 4, 1860.

W. C. Bowles, General Freight Agent, Western Lines, C.P.R., Winnipeg, born at Montreal, June 3, 1875.

J. H. Boyle, Superintendent, District 1, Eastern Division, C.P.R., Farnham, Que., born at Waterloo, Que., June 26, 1869.

F. P. Brady, General Superintendent, National Transcontinental Ry., Quebec to Winnipeg, and Lake Superior Branch, G. T. Pacific Ry., Cochrane, Ont., born at

tinental Ry., Quebec, born at Montreal, June 9, 1860.

E. W. DuVal, Superintendent, District 3, Saskatchewan Division, C.P.R., Saskatoon, born at Toledo, Ohio, June 5, 1885.

Knowlson Elliott, City Freight Agent, C.P.R., Calgary, Alta., born at Gorrie, Ont., June 26, 1884.

J. M. R. Fairbairn, M.Can.Soc.C.E., Assistant Chief Engineer, Eastern Lines, C.P.R., Montreal, born at Peterborough, Ont., June 30, 1873.

W. E. Foster, Solicitor for Ontario, G.T.R., Montreal, born at Belleville, Ont., June 27, 1866.

A. A. Goodchild, General Storekeeper, Eastern Lines, C.P.R., Montreal, born at Peckham, London, Eng., June 3, 1866.

H. W. Harding, Local Secretary, Canadian Northern Ry., London, Eng., born there, June 6, 1869.

Hon. J. D. Hazen, M.P., Minister of Marine, Ottawa, born at Oromocto, N.B., June 6, 1860.

L. K. Jones, I.S.O., Assistant Deputy Minister, Department of Railways and Canals, Ottawa, born at Port Hope, Ont., June 9, 1849.

A. C. Lytle, Assistant Superintendent of Construction, Montreal Tramways Co., Montreal, born at Hemmingford, Que., June 6, 1854.

R. S. McCormick, M.Am.Soc.C.E., Chief Engineer, Algoma Central & Hudson Bay Ry. and Algoma Eastern Ry., Sault Ste. Marie, Ont., born at Quaker City, Ohio, June 22, 1873.

Duncan McDonald, ex-General Manager, Montreal Tramways Co., born at St. Thomas de Montmagny, Que., June 17, 1859.

S. J. McLean, Dominion Railway Commissioner, Ottawa, born at Quebec, June 14, 1871.

C. E. McPherson, Assistant Passenger Traffic Manager, Western Lines, C.P.R., Winnipeg, born at Chatham, Ont., June 7, 1861.

W. R. MacInnes, Freight Traffic Manager, C.P.R., Montreal, born at Hamilton, Ont., June 7, 1867.

G. Manson, Assistant to the Vice President, C.P.R., Montreal, born at Thurso, Scotland, June 8, 1863.

H. N. Merriam, ex-Division Engineer, Pacific Great Eastern Ry., Golden, B.C., born at Waupun, Wis., June 19, 1874.

J. D. Morton, Assistant Comptroller, Canadian Northern Ry., Toronto, born at London, Ont., June 15, 1857.

L. Mulkern, Division Freight Agent, C.P.R., Atlantic Division, St. John, N.B., born at London, Ont., June 18, 1871.

J. E. Pinault, General Superintendent, Canada & Gulf Terminal Ry., Mont Joli, Que., born at Rimouski, Que., June 24, 1884.

F. R. Porter, Assistant General Freight Agent, Grand Trunk Pacific Ry., Winnipeg, born at Stratford, Ont., June 13, 1875.

F. Price, Superintendent of Car Service, G.T.R., Montreal, born there, June 11, 1864.

Allan Purvis, General Superintendent, Eastern Division, C.P.R., Montreal, born at Batavia, Java, June 29, 1878.

J. L. Reyecraft, Solicitor, Manitoba and Saskatchewan Divisions, C.P.R., Winnipeg, born in Orford Tp., Kent County, Ont., June 20, 1868.

L. G. Rogers, Assistant Superintendent, District 1, Ontario Division, C.P.R., Trenton, Ont., born at Richford, Vt., June 18, 1874.

N. Van Wyck, Freight Claims Agent,

Haverhill, N.H., June 22, 1853.

A. H. N. Bruce, M.Can.Soc.C.E., Ottawa, born at Ballyscullion, Ireland, June 18, 1854.

H. W. Brodie, General Passenger Agent, Lines West of Revelstoke, C.P.R., Vancouver, B.C., born at Fredericton, N.B., June 8, 1874.

G. W. Coburn, Resident Engineer, C.P.R., Brandon, Man., born at Upper Melbourne, Que., June 24, 1877.

E. P. Coleman, General Manager, Dominion Power & Transmission Co., Ltd., Hamilton, Ont., and Vice President, Canadian Electric Railway Association, born at Taunton, Mass., June 14, 1867.

W. S. Cookson, General Passenger Agent, G.T.R., Montreal, born at Port Jervis, N.Y., June 12, 1871.

E. L. Cousins, Chief Engineer, Toronto Harbor Commission, Toronto, born there, June 11, 1883.

A. Craig, City Passenger Agent, C.P.R., Hamilton, Ont., born there, June 5, 1884.

A. E. Doucet, M.Can.Soc.C.E., Quebec, ex-District Engineer, National Transcon-

Canada Steamship Lines, Ltd., Montreal, born at Hamilton, Ont., June 29, 1883.
V. G. R. Vickers, Manager, Foreign De-

partment, and Superintendent, Atlantic Division, Dominion Express Co., Montreal, born at Toronto, June 1, 1866.

Walter White, Trainmaster, G.T.R., Palmerston, Ont., born at Toronto, June 4, 1866.

The Use of Rubber Goods in Railway Service.

By J. M. S. Carroll, Manager, Quebec Division, Canadian Consolidated Rubber Co., Ltd.

Railways are amongst the largest users of rubber goods of various kinds, and a general summary of some of the most important lines regularly purchased may be of interest:

Air brake and air signal hose, made to standard M.C.B. specifications. All railways have in recent years improved the general treatment accorded train hose, and complaints on bad quality are now practically unheard of. A large proportion of train hose formerly was destroyed by careless treatment in service, but watchfulness and care on part of railway officials have effected a wonderful improvement in this connection. Brakemen would occasionally give the locomotive man a signal to go ahead, after cutting off certain cars, and omit to disconnect couplings of hose, resulting in undue strain on end of hose; and often a fractured end.

Normal air pressure in 1½ in. train hose is 90 lbs. Wear in Canadian service is not due so much to working pressure

	Length.	I.D.	Enlarged ends
Canadian Pacific...	25 in.	1½ in.	1 3-4 in.
Grand Trunk.....	24 in.	1½ in.	1 13-16 in.
Intercolonial	24 in.	1½ in.	1 5-8 in.
Michigan Central..	24 in.	1½ in.	1 11-16 in.

Up to the present, various roads appear to lack cohesion in seeking to establish standard length and other measurements, applying to steam heater hose. Their nipple equipment varies, and each road no doubt has a disinclination to change its practice and adopt the other's standard. This variation in railway shop practice creates difficulty for the rubber manufacturers, by compelling use of differently equipped mandrils for each railway's requirements.

Steam pressure carried in car heating line varies somewhat, but will average around 60 lbs. Next to the locomotive pressure often reaches 90 lbs. The hard service this line has to undergo makes it important to use only best quality materials and workmanship. An accident to a steam heat line will very quickly be followed by a cold car in zero weather. Gaskets used in steam heater hose are made from a special compound to resist continuous action of steam.

Corrugated steam tender hose is connected from locomotive to tender. The line regularly in use by C.P.R. is 54 x 2½ ins. x 5 ply. Hose acts as a conductor of water from reserve supply in tender to locomotive boiler. Surplus steam is sometimes forced through hose to the tender to superheat the water, thereby saving proportion of cost normally required to heat cold water. This hose in service retains a curved shape.

In railway shops, a large quantity of ½ and ¾ in. air hose is used on riveters, chippers, etc. Service conditions are hard and this hose is subjected to lots of unusually severe treatment. The cover is often cut by contact with sharp metal ends and corners, and as hose undergoes expansion under air pressure, a sharp substance will often puncture it, causing air leak and subsequent destruction. Pressure in this class of hose runs from 75 to 100 lbs., with an average of about 90 lbs. The best hose is none too good for air tool service.

Suction hose, as used by Canadian railways, is usually of roughbore type, 3 ins. i.d. On steam shovel work this class of hose is largely used for replenishing water in boiler. Hose is thrown around a good deal and cheap quality should never be sold. Construction work is often being carried on in remote places. Cheap hose will quickly disintegrate and the cost of delivering inferior hose to site of work is just as great as charges on A-1 material that can be depended upon to deliver lengthy service.

Vacuum hose is used at terminals to clean passenger cars and should be of special quality, the writer has known cases where vacuum cleaners have been put out of business by pieces of inferior tube blocking the parts. Badly cleaned cars bring a strong reprimand from the superintendent, and a general soreness develops against use of cheap hose. Vacuum hose, when in use, is dragged through windows and ends of car, and must be well cushioned by good rubber stock, in order to allow needed resiliency to twist around seats, etc.

Fire hose, both linen and cotton rubber lined is extensively used. Linen hose is also found to be an economical agent to use for wetting down coal piles.

Steam and water hose.—Large quantities of various sizes and plies, in 50 ft. lengths, are regularly used by all railways. This material is usually supplied without couplings.

Hydraulic hose must be of strong construction and preferably protected on cover by wire or heavy duck. This line is used by machine shops in connection with hammers and rams and must withstand considerable pressure.

White corrugated tubing 3-32 in. i.d. x 1-16 in. wall is extensively used in car shops to make deck sashes weatherproof.

Red rubber tubing is used as outside covering on wire berth cables in sleeper and tourist cars. The rubber cover prevents the wire from scratching varnish of cars.

Rubber boots with leather soles, are largely used by mechanical departments of railways. In the operation of washing out locomotive or stationary boilers, this

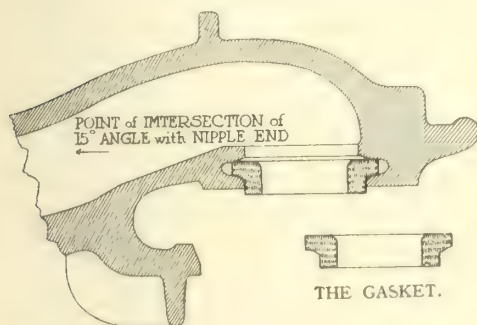


Fig. 1. M.C.B. Standard Air Brake Hose Gasket.

as to climatic extremes met with. Zero weather is troublesome and excessive cold sometimes tends to put the air hose temporarily out of service. Cases have been known on Canadian roads where the hose, in excessively cold weather, became so stiff as to uncouple the ends and thus destroy the brake connection with engine.

Train air signal hose connects between cars the standard signal equipment from the locomotive engineer's cab to end of train. In emergency cases conductor can signal locomotive man or vice versa.

Air brake gaskets play an important part in brake operation. Though small, they are perhaps the most important detail in the air brake hose connection. Experience has demonstrated that gaskets, to be fully effective, must be a specially close fit when seated in position and stock must be of a tough, resilient character. The standard M.C.B. gasket is shaped as shown in Fig. 1, which also shows detail of hose coupling where gasket is seated.

For some years past, the C.P.R. has used air brake gaskets conforming to general measurements of M.C.B. standard, but made with an extra flange, as shown in Fig. 2. This particular shape of gasket is standard with the Westinghouse Co. The Grand Trunk, Grand Trunk Pacific and Canadian Northern are also using the Westinghouse type of air brake gasket. Steam heater hose used on Canadian roads is not of uniform inside diameter, or length. Some of the measurements are as follows:

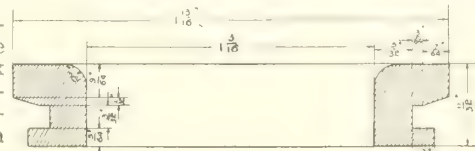


Fig. 2. C.P.R. Standard Air Brake Hose Gasket.

class of boot is especially serviceable.

C.B.S. packing 1-32 in. is used as a protective covering on diaphragms between coaches, to prevent cotton material in diaphragms rotting from continuous exposure to the weather.

C.I. packing 1-16, 1-8 and 1-4 in. is purchased in large quantities throughout the year. This class of packing is used for a variety of purposes, principally however for making gaskets of varying sizes, for both water and steam (low pressure) pipe joints, etc. Red sheet packing is used on high pressure steam lines, being cut into washers and all sizes of gaskets.

Truck tires are used on platform baggage trucks. As cement floors have almost entirely displaced wood the use of rubber tires ensures practically noiseless operation of small trucks, etc.

Pebbled (or dot) rubber is used on steps and platforms of tourist and second class passenger cars.

Inlaid rubber tiling is largely used. The Canadian Pacific, Canadian Northern, Grand Trunk, Grand Trunk Pacific and Intercolonial have hundreds of sleeping, dining and observation cars equipped with it. The rubber floor is noiseless, attractive in appearance, very enduring, and easy to clean.

Head light gaskets are used on large locomotive head lights to prevent undue vibration. Rubber stock used in this line is tough and has lots of resiliency.

The foregoing comprise the leading lines of rubber goods used in the operation of railways on this continent. A multitude of moulded rubber articles are also used in shop practice. Without rubber, railways would have great difficulty in operating.

Steam Railway Statistics for Year Ended June 30, 1915.

In the following table the column headed gross earnings includes passenger and freight earnings, as well as miscellaneous earnings; the latter not being shown separately; the next four columns give the operating expenses classified under their various headings, while the last gives the net earnings, which are arrived at by deducting the totals of the four columns referred to from the figures in the gross earnings column. The minus (—) mark before figures in the net columns shows that there was a deficit in the operations of the line to the extent of the figures given. The cents have been omitted in all cases, and the figures in the totals show the aggregate earnings, etc., including the cents, omitted from the detailed items.

Name of Railway	Mileage	Passenger Earnings	Freight Earnings	Gross Earnings	Maintenance of Way and Structures	Maintenance of Equipment	Traffic and Transportation Expenses	General Expenses	Net Earnings
Algoma Central & Hudson Bay	347.81	\$ 65,492	\$ 458,748	\$ 615,153	\$ 122,682	\$ 85,242	\$ 237,625	\$ 43,129	\$ 126,273
Algoma Eastern	88.94	44,614	200,643	285,367	43,215	28,116	88,196	15,955	109,882
Atlantic, Quebec & Western	102.42	34,872	42,649	77,522	26,767	18,586	53,953	14,358	—36,143
Bedlington and Nelson	12.04	26	3	29	2,807	151	661	801	—4,393
Brandon, Sask. & Hudson Bay	69.45	26,281	23,042	49,388	41,168	9,872	50,652	5,105	—57,409
British Yukon	121.12	54,838	236,143	291,744	21,880	9,940	45,963	15,817	198,142
Canada & Gulf Terminal	35.80	20,197	21,396	41,852	8,819	2,323	19,085	7,022	4,602
Canada Southern	380.04	3,186,695	6,474,461	9,720,956	898,500	1,196,809	3,661,910	248,400	3,715,335
Canadian Government									
Intercolonial	1,450.60	3,947,891	7,187,449	11,259,709	2,116,981	2,235,592	6,676,956	319,225	—89,405
Prince Edward Island	275.20	212,621	186,560	412,520	170,116	92,756	314,536	19,634	—184,523
Canadian Northern	7,980.27	6,128,670	18,211,408	25,912,106	3,974,820	3,004,746	10,644,702	1,199,675	7,088,160
Canadian Pacific	12,823.50	28,720,643	60,285,597	90,830,245	11,400,538	11,307,965	35,073,333	2,430,731	30,617,675
Cape Breton	31.00	5,436	4,743	10,435	6,245	920	10,532	3,215	—10,487
Caraquet	84.78	24,054	45,255	71,582	17,163	8,180	33,392	8,219	4,626
Crows Nest Southern	74.18	11,059	63,013	74,085	91,706	18,569	55,148	7,345	—98,682
Cumberland Ry. & Coal Co.	32.00	18,005	83,290	101,883	20,948	6,907	44,220	3,105	26,702
Detroit River Tunnel	1.45								
Dominion Atlantic	274.16	405,921	508,716	931,052	206,863	105,029	387,023	34,779	197,356
Eastern British Columbia	14.00	2,084	30,510	33,246	10,590	4,435	13,950	1,630	2,639
Elgin and Havelock	27.00	3,999	7,761	11,760	4,612	1,113	5,887	315	—166
Esquimalt and Nanaimo	199.00	232,566	289,606	542,202	87,821	53,224	204,884	9,030	187,240
Essex Terminal	10.00		43,505	48,340	12,708	1,372	13,388	4,111	16,746
Fredrickton & Grand Lake									
Coal & Railway Co.	35.00	7,457	53,667	62,137	11,304	21,701	27,433	7,507	—5,810
Grand Trunk	3,551.64	12,199,082	23,745,812	36,456,217	4,409,695	6,076,123	15,865,763	1,282,498	8,822,136
Grand Trunk Pacific	2,228.91	1,580,332	4,950,028	6,660,580	1,887,451	1,611,323	3,291,315	593,575	—723,081
Hereford	52.18	20,686	69,751	90,836	30,118	14,964	50,410	3,803	—14,461
International of N.B.	111.30	41,367	60,249	102,403	47,330	7,289	41,755	2,200	3,826
Inverness Ry. & Coal Co.	60.91	23,231	188,352	212,911	37,998	26,901	51,092	6,694	90,324
Kent Northern	27.00	8,704	11,543	20,247	7,090	3,725	8,871	645	—83
Kettle Valley	255.75	3,608	14,506	18,383	7,963	760	6,746	1,426	1,485
Klondike Mines	31.81								
London & Port Stanley	23.66	28,986	108,371	138,196	18,388	25,703	94,366	5,900	—5,962
Lotbiniere & Megantic	30.00	7,167	16,287	23,435	9,610	2,669	8,431	4,992	—2,269
Magnetawan River	1.91								
Maine Central, (Princ. Br.)	5.10	11,829	6,731	18,561	2,102	2,403	8,828	815	4,411
Manitoba Great Northern	91.77	6,304	18,169	24,760	61,444	6,140	35,616	4,349	—82,790
Maritime Coal, Ry. & Power	15.00	6,623	62,823	69,471	11,752	5,808	20,418	2,231	29,261
Massawippi Valley	35.46	67,142	132,465	201,226	70,005	37,951	110,184	10,260	—27,176
Midland of Manitoba	6.40	134,618	97,888	251,137	56,104	41,935	248,933	15,871	—111,797
Montreal & Atlantic	163.40	219,003	693,743	930,425	212,120	75,666	455,267	34,768	152,503
Montreal & Province	58.60	39,837	63,818	105,810	37,153	2,977	48,606	2,073	15,000
Montreal & Vermont Jct.	23.60	72,729	53,366	126,298	21,403	10,746	38,072	4,035	50,040
Morrissey, Fernie & Michel	10.85	10,168	83,465	93,633	13,519	13,408	35,377	21,217	10,110
Moncton & Buctouche	32.00	12,054	17,906	31,213	7,115	3,956	14,971	5,541	—371
Napierville Jct.	27.06	14,335	82,302	96,821	12,761	7,272	33,149	1,511	42,126
National Transcontinental	1,993.50	39,006	240,842	280,887	153,019	35,924	157,163	11,002	—76,222
Nelson & Fort Sheppard	55.42	21,845	24,336	47,145	39,525	5,416	44,431	5,276	—47,505
New Brunswick Coal & Ry. Co.	58.00	13,213	26,990	42,659	20,831	9,219	14,387	3,615	—5,395
New Brunswick & P.E.I.	35.79	14,969	34,364	49,451	23,175	7,801	25,792	1,141	—8,459
New Westminster South	23.73	7,956	19,550	29,710	7,314	2,444	12,267	2,110	5,573
North Shore	8.63	205	619	825	70		899	18	—163
Northern New Brunswick & Seaboard	19.80	608	1,028	1,636	741	20	2,391	1,425	—2,942
Nosbonsing & Nipissing	5.50								
Ottawa and New York	56.90	93,018	117,341	212,314	99,635	45,791	127,848	10,747	—71,708
Pere Marquette in Canada	198.81	169,588	2,220,171	2,400,874	279,616	174,406	939,122	83,888	923,840
Phillipsburg Ry. & Quarry	6.00								
Quebec Central	253.00	416,372	903,397	1,340,265	181,026	130,899	542,706	48,970	436,661
Quebec Oriental	100.00	55,384	67,503	122,968	35,590	14,145	52,202	14,375	6,650
Quebec Ry. Light & Power	30.82	8,936	69,336	78,528	8,061	23,108	32,928	7,783	6,716
Quebec, Montreal & South	192.18	153,407	205,497	360,992	101,572	173,407	163,762	16,167	—93,917
Red Mountain	9.59	3,118	7,776	11,154	9,322	747	12,699	960	—12,576
Rutland & Noyan	3.39	8,470	5,617	14,087	3,395	2,012	5,511	676	—2,491
Roberval-Saguenay	36.80	9,642	98,326	158,255	20,672	10,086	45,990	8,365	73,050
Salisbury & Albert	45.00	11,858	21,608	36,161	10,268	9,015	13,070	2,587	1,220
Schomberg & Aurora	14.40	5,940	6,109	12,050	6,516	1,411	6,952	391	—3,221
Stanstead, Shefford and Chamblay	43.00	38,845	39,289	78,642	29,098	6,816	49,702	2,687	—9,662
St. Clair Tunnel	1.10		328,708	333,919	24,239	32,071	65,584	4,765	207,288
St. Lawrence & Adirondack	46.12	244,343	309,024	556,068	78,108	32,207	293,442	13,334	1138,979

(Continued on page 219)

Steam Railway Statistics for Year Ended June 30, 1915 (Continued from page 218)

Name of Railway	Mileage	Passenger Earnings	Freight Earnings	Gross Earnings	Maintenance of Way and Structures	Maintenance of Equipment	Traffic and Transportation Expenses	General Expenses	Net Earnings
St. Martins.....	30.00	5,965	12,291	18,389	7,866	647	7,214	895	1,765
Sydney & Louisburg.....	70.00	53,178	647,947	720,298	89,609	157,343	264,210	25,854	183,281
St. John & Quebec.....	118.82	11,380	29,955	38,883	21,473	2,324	22,021	2,131	— 9,067
Temiscouata.....	113.00	59,633	158,914	220,482	48,712	28,800	80,324	19,194	43,450
Timiskaming & Nor. Ont.	328.49	550,398	893,067	1,477,724	396,355	273,982	639,571	98,749	69,066
Thousand Islands.....	6.33	12,414	19,152	34,983	5,570	630	15,181	4,375	9,224
Toronto, Hamilton & Buffalo	95.03	399,645	851,512	1,256,168	201,047	167,281	521,698	52,336	313,803
Vancouver, Victoria and Eastern.....	261.67	181,323	303,459	507,560	252,627	57,008	296,463	35,021	—133,559
Victoria and Sidney.....	15.97	20,321	11,071	31,679	16,587	4,947	19,674	3,772	—13,031
Victoria Terminal Ry. & Ferry Co.....	0.99	1,700	803	2,809	379	312	1,245	344	617
Wabash in Canada.....		425,133	1,867,139	2,303,612	324,228	554,369	1,228,379	86,505	110,120
York & Carleton.....	10.50	1,893	3,786	5,679	1,218	269	2,347	20	1,824
	35,582.44	\$60,699,934	\$134,488,303	\$199,843,072	\$28,762,906	\$28,156,261	\$83,840,915	\$6,973,025	\$52,111,972

Notes to Steam Railway Statistics.

The total mileage of 35,582.44 given in the foregoing table is the actual length of the railways being operated at June 30, 1915, but the total mileage reported by the different companies as being operated was 36,520.54, a difference of 938.10 miles. This is accounted for by the fact that 22 companies have trackage rights over other companies' lines to the extent named, the most noticeable of these being the Wabash, which operates over 245.40 miles of the Grand Trunk, without owning any line in Canada; and the Pere Marquette, which operates over 335.59 miles, of which 198.81 is owned, and 136.78 is operated under trackage rights. The total mileage given in the table includes the Nosbonsing & Nipissing, 5.50 miles, the track of which was taken up in 1913. The total mileage reported at June 30, 1914, was 30,794.54, so that the increase for the year was 4,787.90 miles. The Canadian Northern figures include the following companies, which reported separately in 1913-14: Canadian Northern, Canadian Northern Ontario, Canadian Northern Quebec, Brockville, Westport & Northwestern, Halifax & South Western, Irondale, Bancroft & Ottawa, Central Ontario, and Quebec & Lake St. John. The Grand Trunk figures include those of the Canada Atlantic.

The traffic statistics for the New Brunswick and Prince Edward Island cover 11 months from Aug. 1, 1914; and those for the St. John & Quebec six months from Jan. 1, 1915.

Russian Railway Extensions.—It has been officially announced that the railway between Petrograd and Kola will be completed by the end of this year, and communication established with the port of Alexandrovsk, which is free of ice all the year round. A number of other lines have been connected near Moscow, and a project to connect the Yaroslav and Nijni lines is under way.

Women as Car and Locomotive Cleaners.—Owing to enlistment of men for war purposes, most of the railway companies in Great Britain have engaged women for cleaning passenger cars, and some of them have introduced females into the locomotive sheds to assist in cleaning locomotives. When engaged in their work, the women wear overalls similar to those worn by the men similarly employed.

The export of pig iron, and of steel of various kinds used by railways and shipbuilders, has been absolutely forbidden by the British Government.

Dominion Government Railway to Hudson Bay.

Referring to the building of this railway from Pas, Man., to Port Nelson, the acting Minister of Railways said in the House of Commons recently, that there were possibly many who doubted the advisability of the construction of this railway. While he had had grave doubts as to the feasibility of the undertaking, he had come to the conclusion, after seeing the reports in the Department, and discussing the matter with those who are at work in connection with the railway, that the road will be of value to the country in time to come. It will serve a useful purpose in opening up a large area of agricultural land for settlement; there is also a large area believed to contain mineral resources, and there will be the fisheries in Hudson Bay, which it is expected will rank with those that have made the Newfoundland waters famous. Further, there was no doubt in his mind as to the navigability of Hudson Bay and Straits for several months of the year. This had been demonstrated to his satisfaction since the Railways Department, for its own purpose purchased three vessels for use in its Hudson Bay service, as well as chartering several others, and so far as these vessels are concerned, they have navigated this route without meeting with any accident of importance. It is true that during the first season two vessels were cast away right at Nelson under circumstances which have never been satisfactorily explained and which have absolutely no bearing upon the practicability of the Nelson route. The vessels that were purchased were not built purposely for this route, and other vessels would perhaps be found safer.

As to the railway, it was not expected that there would be any great rush of traffic during the first few years after it was opened, but the time would come when it would be of immense value to Western Canada. He believed also that in years to come the line would have a military value. Its total length to Port Nelson is 424 miles. Grading has been completed to mile 378; steel has been laid, including sidings, to mile 242, at which point the erection of the Mountain Rapids bridge over the Nelson River is being proceeded with. The work was expected to be completed in April and track laying will be resumed. The track is surfaced to mile 242, and a final lift of ballast has been given to mile 150. The telegraph line keeps pace with the steel, and has been laid to mile 242. The work is divided into three sections, and all three contracts were given to J. D. McArthur

& Co. On section 1, \$3,229,994 has been expended; on section 2, \$1,602,300, and on section 3, \$1,865,795, a total of \$6,698,089. The total value of the work under contract is estimated at \$9,629,605. During the coming summer the track will be carried forward to the second crossing of the Nelson River at Kettle Rapids, at mile 332. Here a large bridge is to be constructed and it is not expected that track work can proceed beyond this point until the spring of 1917, but, when resumed, it will be carried through to Port Nelson without further delay.

At Port Nelson good progress has been made on the permanent work of harbor development. Previously the work done at that point has been of a preliminary character, consisting of the establishment of the camp, construction of plant, shops for repair of plant, temporary wharves, drydock, etc., necessary for the prosecution of the work. The substructure for the bridge approach to the main dock has been carried out half a mile from shore, and the whole of the bridge superstructure will be completed this coming season. The suction dredge was employed excavating the approach channel with satisfactory results, the remaining dredges, tugs and scows being chiefly occupied in procuring stone filling for cribs and riprap.

The total expenditure upon the H.B.R. and terminals to Dec. 31, 1915, was as follows:

General expenses, engineering, etc.....	\$ 721,974
Pas bridge and terminals.....	388,172
Pas to Thicket Portage:	
On contract account.....	\$3,229,994
Rails, bridges, etc.....	2,680,896
	5,910,890
Thicket Portage to Split Lake Jct.	1,661,291
Split Lake Jct. to Port Nelson.....	1,815,869
Port Nelson terminal.....	4,977,208
	\$15,465,304

Delaware, Lackawanna & Western Rd. Connection.—In the discussion on the extension of the charters for railways in the Niagara Peninsula of Ontario, controlled by Canadian Northern interests, the rumor has been revived that when the C.N.R. builds to the Niagara frontier it will connect with the D.L. & W. and thus secure direct connection with New York. The D.L. & W. mileage from Buffalo to New York is 411 miles.

Trackmen's Wages on Government Railways.—The management has voluntarily increased trackmen's wages to \$1.75 a day on country sections and \$1.85 in cities, and coal shovellers and ash pit men's wages to \$1.70 a day.

The Pacific Great Eastern Ry. has resumed traffic on its Squamish-Clinton section, which had been closed since 'e severe snowstorms of January.

Grand Trunk Railway Report and Meeting.

The report for the year ended Dec. 31, 1915, presented at the annual meeting in London, Eng., recently, shows the revenue account as follows:—

Gross receipts	\$8,292,688-1-1
Working expenses, 78.52 p.c.	6,511,257-4-7
	\$1,781,430-16-6
Income from rentals and hire of equipment	373,222-6-2
Total net revenue	\$2,154,653-2-8
Amount received from International Bridge Co.	31,968-2-6
Interest on Central Vermont Ry. bonds	13,013-8-6
Interest on securities controlled companies and St. Clair Tunnel bonds acquired by issue of G.T.R. 4 per cent. debenture stock	245,195-14-9
Balance of general interest account	95,870-15-5
Net revenue receipts	\$2,540,701-3-10
The gross earnings for 1914 were	\$8,-

596,767; working expenses, \$6,841,919; net traffic receipts, \$1,754,848; income from rentals and hire of equipment, \$327,044; total net revenue, \$2,081,892; income from securities, \$274,362; balance of general interest account \$81,438; making net revenue receipts for the year ended 1914, \$2,437,592.

The net revenue charges for 1915 were \$2,030,017-5-10, against \$2,012,477, leaving a surplus for 1915, of \$510,683-18-0, against a surplus of \$425,115 for the previous year.

Adding the balance of \$4,323-7-9 at the credit of net revenue account on Dec. 31, 1914, the amount available for dividend at Dec. 31, 1915, was \$515,007-5-9, from which an interim dividend of 1½% on the 4% guaranteed stock, amounting to \$187,500, was paid Nov. 9, 1915, leaving a balance of \$327,507-5-9, from which it was decided to pay a further dividend of 2½% on the same stock, making the total divi-

dend for the year. This absorbed \$312,500, the balance of \$15,007-5-9 being carried to the current year's accounts.

Vacancies on the board caused by the death of Lord Welby, and the resignation of G. von Chauvin, were filled during the year by the election of Sir H. A. Yorke and S. Baldwin, M.P. The remaining directors were re-elected.

The Association of Railway Claim Agents held its annual convention at Atlantic City, N.J., May 17 to 19. Addresses were given, or papers read, on the following subjects: The Federal Employers' Liability Act; prevention of accidents; handling of claims of railway postal clerks; the Ardmore explosion; claim economics; close co-operation of claim and operating departments in the investigation and settlement of claims; and how to cope with the ambulance chasing lawyer and the damage suit doctor.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed the paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates of orders, immediately following the numbers, are those on which they were drawn.

General order 164, Apr. 25.—Suspending, pending further hearing by Board, tariffs of railway companies showing charges for sale and ice in refrigerator cars.

24893. Apr. 12.—Approving G.T.R. form of release and power of attorney 151 to be signed by persons who desire, for special reasons, to travel in cars which are not intended to carry passengers.

24894. Apr. 18.—Amending order no. 14956, Oct. 9, 1911, re operation of Canadian Northern Ry. between Delisle and Macrorie, Sask.

24895. Apr. 15.—Authorizing London & Port Stanley Ry. and Michigan Central Rd. to connect their tracks, in St. Thomas, Ont., and to cross streets shown on plan filed with the Board, except second crossing of Talbot St., and crossover track on Moore St., new plan to be filed by L. & P. S. R. in accordance with these requirements.

24896. Apr. 13.—Authorizing Canadian Northern Ry. to build spur to gravel pit and to cross Government road allowance between Secs. 19 and 30, Tp. 25, R. 17, w.3.m., Sask.

24897. Apr. 14.—Ordering Canadian Northern Ry. within 60 days to install bell at crossing of Desormeaux St., Tetreaultville, Que., 20 per cent. of cost to be paid out of railway grade crossing fund, balance by City of Montreal.

24898. Apr. 13.—Authorizing Canadian Northern Ry. to build across Russell Road with its proposed connection with G.T.R., in Lot 11, Gloucester Tp., Ont., reserving question of diversion or protection of the highway.

24899. Apr. 18.—Amending order 20657, Oct. 24, 1913, re operation of Canadian Northern Ry. between Macrorie and Elrose, Sask.

24900. Apr. 17.—Authorizing Canadian Northern Ry. to remove station agent at Ruel, Ont.

24901. Apr. 17.—Authorizing C.P.R. to build at grade, its Swift Current Northwesterly Branch, between main untravelled highways, between mileages 15.4 and 25.10, Sask.

24902. Apr. 17.—Authorizing C.P.R. to divert Government trail in n.w.¼ Sec. 23-38-12, w.4.m., Alta., and to build, at grade, its Swift Current Northwesterly Branch, at mileage 14.90 across same and to close diverted portion within limits of the right of way.

24903. Apr. 17.—Authorizing C.P.R. to divert Government road allowance between Secs. 11 and 14-38-12, w.4.m., Alta., and to build, at grade, its Swift Current Northwesterly Branch across same.

24904. Apr. 17.—Dismissing application of M. Griffin, Whitby, Ont., for order directing Toronto Eastern Ry. to pay damages for alleged injury to Lots 243 to 246, Mary St., Whitby.

24905. Apr. 17.—Ordering London St. Ry. to lay double track across G.T.R. at Richmond St., London, Ont., and to rearrange interlocking plant to take care of additional track, and before proceeding, to file plan showing proposed changes, for approval of Board's Engineer; City of London to insert necessary diamond in track at the crossing; I.S.R. to pay cost of laying the double track to G.T.R. and connecting with the diamond, and to pay to the City, equivalent to 7 per cent. on expense that city is put to, for such time as L.S.R. operates over G.T.R.

24906. Apr. 18.—Authorizing Canadian Northern Quebec Ry. to build bridge across Rouge River, Lots 25 and 32, R. 1, Arundel Tp.

24907. Apr. 3.—Authorizing C.P.R. to build spur for Canadian Oil Companies, Ltd., at Weyburn, Sask.

24908. Apr. 18.—Ordering G.T.R. to build farm crossing at or near line between Lots 37 and 38, Con. 2, Sidney Tp., Ont.

24909. Apr. 18.—Authorizing London & Lake Erie Ry. & Transportation Co. to sell through passenger tickets from points on its line to points on or via Michigan Central Rd., the latter to honor same subject to prompt accounting therefore by L. & L. E. R. & T. Co.

24910. Apr. 19.—Rescinding order 23418, March 16, 1915, re protection at cross of G.T.R. spur at Rockland, Ont.

24911. Apr. 17.—Authorizing St. Placide and St. Benoit parishes, Que., to build shelter and platform on Canadian Northern Ontario Ry. at Cote Double, and rescinding order 24613, Dec. 29, 1915.

24912. Apr. 18.—Ordering C.P.R. to operate trains 529 and 530 to Monitor, Alta., and to continue present mixed service with trains 611 and 612; effective May 1.

24913. Apr. 19.—Authorizing Michigan Central Rd. to build extension of siding and additional tracks for Electro Metals Co., Welland, Ont.

24914. Apr. 20.—Authorizing Montreal & Southern Counties Ry. to use bridge over creek on Lot 747, Con. 8, Granby Parish, Que.

24915. Apr. 22.—Suspending, pending hearing on date to be fixed by Board, following tariffs:—C.P.R., C.R.C. no. E-3129; G.T.R. C.R.C. no. E-3345; and C.N.R. Supplement 9 to C.R.C. 584, re rates on wood pulp and sulphite pulp from stations in Canada to points in the United States.

24916. Apr. 22.—Extending to July 1, time within which C.P.R. shall rebuild crossing on its Reston-Wolsley Branch between Secs. 4 and 9-11-33, W.I.M., Sask., to conform with Board's Standard Regulations.

24917. Apr. 22.—Approving G.T.R. Form of Release and Power of Attorney 151, to be signed by persons who desire, for special reasons, to travel in cars which are not intended to carry passengers.

24918. Apr. 25.—Approving C.P.R. location of station at Admiral, Sask.

24919. Apr. 22.—Authorizing Montreal & Southern Counties Ry. to open for traffic its line from Abotsford to Granby, Que., 8.60 miles.

24920. Apr. 25.—Ordering C.P.R. to build farm crossing for and at expense of W. & J. Gracey, Shelburne, Ont., to be completed by June 1.

24921. Apr. 20.—Ordering New York Central & Hudson River Rd. and C.P.R. to stop certain trains at Highlands, Que., until a change is authorized by Board.

24922. Apr. 26.—Approving agreement between Bell Telephone Co. and Dawn Tp., Ont., Apr. 13.

24923. Apr. 25.—Approving plan A-101, of City of Toronto, No. 8, 1913, as revised.

24924. Apr. 26.—Authorizing Canadian Northern Ontario Ry. to build spur for Marshay Lumber Co., in Marshay Tp., Ont.

24925. Apr. 26.—Authorizing Saskatchewan Highway Commissioners to build highway over C.P.R. Pheasant Hills Branch in s.e. ¼ sec. 32-36-9, w.3.m.

24926. Apr. 18.—Authorizing C.P.R. to divert road allowance between Cons. 3 and 4, South Sherbrooke Tp., Ont.; to close diverted portion within limits of right of way, and to take certain lands for diversion.

24927. Apr. 28.—Amending order 24907, Apr. 3, re C.P.R. spur at Weyburn, Sask.

24928. Apr. 27.—Approving plans 4301B-1-A, B, C and D, of Quinlan & Robertson, Ltd., show-

ing false work to support Bloor St. viaduct, Toronto, during construction. If G.T.R. and C.N.R. find it necessary to appoint inspector or watchman to ensure safety of trains, wages of such shall be paid by applicants.

24929. Apr. 27.—Extending for three months from Mar. 31, subject to order 24270, Oct. 5, 1915, time within which C.P.R. may carry traffic over its Stirling East Branch, mileage 49.2 to 74.5, Alta.

24930. Apr. 28.—Authorizing Canadian Northern Ry. to build spur to serve Block B, plan B, Prince Albert, Sask., to cross River St. and Second Ave. West, for 10 years as consented to by city, unless otherwise ordered by Board.

24931. Apr. 27.—Authorizing Peck Rolling Mills, Ltd., to build railway across Mill St. and Montreal & Southern Counties Ry. at grade, in Montreal.

24932. Apr. 28.—Authorizing G.T.R. to build siding for W. S. Cook & Son, Belleville, Ont.

24933. May 1.—Authorizing G.T.R. to carry McGill University mining students destined to Sydney, N.S., at half one way first class fare from Montreal to Sherbrooke, Que., and return; any other parties desiring to travel for same purpose between Montreal and Sherbrooke, Que., to be granted equally favorable terms, until otherwise ordered.

24934. April 29.—Ordering Canadian Northern Ry. to appoint station agent at Lavoy, Alta.

24935. April 29.—Approving interlocking plant controlling crossings at Essex Terminal Ry. with Windsor, Essex & Lake Shore Rapid Ry. and C.P.R. in Sandwich West Tp., Ont.

24936. May 2.—Authorizing C.P.R. to build reinforced concrete trestle at mileage 29.81, Bredenburg Subdivision, near Strathclair, Man.

24937. May 1.—Dismissing application of Town of St. Lambert, Que., for order directing Montreal & Southern Counties Ry. to place track upon permanent foundations, reserving to applicant right to make further application later; ordering M. & S. C. Ry. to change grade on Elm, Desaulniers and Bird Sts., St. Lambert, to conform to highway level, cost to be paid by applicants, and authorizing applicant to build permanent roadway between rails and for 2 ft. on each side on said streets; company to be relieved of maintaining gravel there, but to contribute such portion of cost as will fairly represent its present liability in this regard.

24938. April 25.—Amending order 19570, June 13, 1913, re furnishing slats for floors of refrigerator cars by adding: "2. That where shippers furnish slats for the said cars, an allowance of 500 lbs. in weight per car be made."

24939. May 1.—Ordering G.T.R., within 90 days, to install improved automatic bell at crossing of public road near Lyn, Ont.; dip in grade on north approach to be levelled to give clear view over low ridge to west; 20 per cent. of cost of bell, and 20 per cent. of cost levelling approach to be paid out of railway grade crossing fund.

24940. May 3.—Ordering C.P.R. to appoint station agent at Beresford, Man., by Sept. 1.

24941. May 4.—Amending order 24911, Apr. 17, by changing figures of previous order referred to from 26413 to 24613. (This was noticed in our summary and corrected there.)

24942. May 3.—Authorizing G.T.R. to build siding across Brant St., Burlington, Ont.

24943. May 4.—Ordering C.P.R. to extend commercial track at Domain, Man., for 400 ft., and to appoint station agent there; and to move station platform back to clear road allowance; to be done by Sept. 1.

24944. May 3.—Authorizing G.T.R. to build spur for Colonial Hide Co., Wellington St., Montreal.

24945. May 5.—Suspending, until further order, items on page 3, Supplement 10 to C.P.R. tariff C.R.C. no. W-2061, Esquimalt & Nanaimo Ry. tariff C.R.C. 302, and Kettle Valley Ry. tariff C.R.C. 52, covering minimum carload weights on forest products.

24946. May 4.—Amending order 24799, Mar. 14, re C.P.R. road diversion at mileage 45.54 of its Weyburn-Lethbridge Branch, Sask.

24947. May 8.—Authorizing C.P.R. to build spur for J. M. Stones at mileage 36.6, Trenton Subdivision, crossing unopened road allowance between Bedford and Oso Tps., Ont.

24948. May 6.—Approving agreement between Bell Telephone Co. and Kemble-Sarawak Telephone Co., Apr. 26.

24949. May 5.—Relieving G.T.R. from providing further protection at Canifon Road, Belleville, Ont.

24950. May 9.—Authorizing London & Port Stanley Ry. to build spur from Bathurst St., north-westerly across G.T.R. property and Clarence St., immediately to south of G.T.R. yard, London, Ont.

24951. May 9.—Authorizing C.P.R. to build spur for J. A. Barrett, at mileage 0.70, Prescott Subdivision, Ont.

24952. May 6.—Authorizing C.P.R. to bridge a Y at grade across Canadian Northern Ontario Ry. and Russell Road, Gloucester Tp., track connecting St. Lawrence & Ottawa Ry. and Montreal & Ottawa Ry.

24953. May 8.—Authorizing Canadian Northern Ry. to open for traffic its Oakland Branch from mileage 42 to 54; speed of trains limited to 15 miles an hour.

24954. May 8.—Authorizing Canadian Northern Quebec Ry. to build transfer track with Pointe aux Trembles Ry. at mileage 170.28 from Quebec.

24955. May 8.—Authorizing Michigan Central Rd. to build siding for Canadian Aloxite Co. near Montrose Jct., Ont.

24956. May 8.—Authorizing C.P.R. to rebuild bridge 35.8, Brandon Subdivision, Man.

24957. May 8.—Authorizing G.T.R. to build additional tracks, and to alter existing tracks, for Canadian Explosives, Ltd., in Bevel Parish, Que.

24958. May 9.—Authorizing C.P.R. to build spur for Rock Springs Coal & Brick Co. in legal subdivision 14, n.w. ¼ sec. 3-10-17, w.4.m., Alta.

24959. May 8.—Approving G.T.R. clearances at crating shed and unloading platform of Ford Motor Co. of Canada, Ford City, Ont.

24960. May 9.—Ordering C.P.R. to install improved type of automatic bell at Rankin St., Campbelltown, Ont., by Sept. 1; 20 per cent. of cost to be paid out of railway grade crossing fund, and until Sept. 1, relieving it from providing further protection at said crossing.

24961. May 10.—Authorizing G.T.R. to build temporary siding, and to change existing sidings, for Dominion Flour Mills, Ltd., adjacent to Lachine Canal Reserve, Montreal Parish, Que.

24962. May 10.—Authorizing C.P.R. to build spur for Godson Contracting Co., mileage 0.60 on McTier Subdivision, Ont.

24963. May 11.—Authorizing C.P.R. to build siding for Canada Nitro Products, Ltd., Yorkton Tp.

24964. May 10.—Authorizing Canadian Northern Ry. to construct four spurs to serve Block 10, Parkview, Calgary, Alta., and to cross Spruce Ave.

24965. May 10.—Dismissing C.P.R. application for order directing Montreal Light, Heat & Power Co. to assume cost of changes in power line crossing incidental to building of Decary Ave. subway, Montreal.

24966, 24967. May 12.—Amending orders 19245, May 12, 1913, and 21873, May 26, 1914, re Lake Erie & Northern Ry. crossings of G.T.R. at station 1074+72.9 near Paris, and station 1281+58, Simcoe, Ont., respectively.

24968. May 6.—Suspending, pending hearing by Board, item 20A on page 2 of supplement 13 to C.P.R. C.R.C. no. W-2110, showing rates on pig lead, spelter and antimony.

24969. May 10.—Authorizing C.P.R. to rebuild bridge 1.9, Prescott Subdivision, near Ottawa, Ont.

24970. May 10.—Authorizing Michigan Central Rd. to rebuild bridge over Bear Creek, mileage 1.25, Petrolia Branch, Ont.

24971. May 11.—Authorizing Canadian Northern Ry. to close road allowance, within right of way fences, between Secs. 2 and 3-31-20, and to divert through s.w.¼ Sec. 2-31-20, w.4.m., Alta.

24972. May 10.—Approving Vancouver, Victoria and Eastern Ry. & Navigation Co.'s by-laws 8 and 9, Apr. 20.

24973. May 20.—Certifying and allowing corrections in C.P.R. plan of location through n.e.¼ Sec. 18-15-13 and s.e. Sec. 19-15-13, w.3.m., as shown on plan marked A on the 10th Board.

24974. May 11.—Amending order 24781, Mar. 3, re Grand Trunk Pacific Ry. spurs for Imperial Oil Co. in w.¼ Sec. 32-17-19, w.2.m.

24975. May 15.—Authorizing C.P.R. to make a road crossing of its line on a bridge, any of Sec. 27-34-23, w.3.m., Sask., and close road allowance within limits of right of way and to build a bridge over the same.

24976. May 15.—Ordering Canadian Express Co. and G.T.R. to arrange for through shipments of fruit from Jordan, Vineland and other Niagara points, from July 1 to Aug. 31 inclusive; when conditions allow shippers to do with reduced rates.

ingly.

24977. May 15.—Approving agreement between Bell Telephone Co. and Palace Road Mutual Telephone Association, Apr. 26, 1915.

24978. May 16.—Amending order 24895, Apr. 15, re London & Port Stanley Ry. and Michigan Central Rd. connection at St. Thomas, Ont.

24979. May 15.—Authorizing Canadian Northern Ry. to build spur in s.e.¼ Sec. 10 and s.w.¼ Sec. 11-24-1, w.5.m., Alta.

24980-24981. May 6.—Recommending to Governor in Council for approval, Brantford & Hamilton Electric Ry. and Hamilton Radial Electric Ry. bylaw, Apr. 26, regulating travel on cars.

24982. May 17.—Suspending, pending hearing by Board, tariffs C.P.R. C.R.C. no. W-2075; C.N.R. C.R.C. no. W-861, and G.T.P.R. C.R.C. no. 100, re increased charges for live stock shipments.

24983. May 15.—Authorizing Boston & Maine Rd. to operate locomotives used in international traffic and merely passing through Canadian territory, equipped with clear vision window in cabs; permission not to extend to locomotives operated from or entirely within Canadian territory.

24984. Apr. 13.—Amending order 17562, Sept. 25, 1912, authorizing Toronto, Hamilton & Buffalo Ry. to build spur, in Hamilton, for National Steel Car Co.

24985. May 12.—Amending orders 20643 and 24923, Oct. 23, 1913, and Apr. 25, 1916, respectively, re rebuilding of C.P.R. bridge at Strachan Ave., Toronto.

24986. May 17.—Ordering C.P.R., within 60 days from date to install bell at second line west, Chinguacousy Tp., Ont.; 20 per cent. to be paid out of railway grade crossing fund.

24987. May 17.—Extending for three months from date time within which G.T.R. shall complete highway over its line in Tay Tp., Ont.

24988. May 18.—Ordering C.P.R. by Sept. 1, 1917, to erect class A-2 station at Piapot, Sask.

24989 to 24991. May 18.—Ordering Canadian Northern Ry. to erect standard fourth class stations at Beaddle, D'Arcy, and Carmel, Sask., by Sept. 1.

24992. May 18.—Amending order 4391, Feb. 25, 1908, re G.T.R. spur crossing of C.P.R. at Lindsay, Ont.

24993. May 22.—Approving agreement between Bell Telephone Co. and Wotton Local Telephone Co., May 3.

24994. May 22.—Suspending, pending hearing by Board, railway tariffs showing charges for heated refrigerator cars.

General order 165, May 16.—Suspending, pending further hearing by Board, following tariffs, showing charges for ice and salt in refrigerator cars.—C.P.R. C.R.C. no. W-2149 and W-2150; C.N.R. C.R.C. no. W-927 and W-930; G.T.P.R. C.R.C. no. 155 and 156; Esquimalt & Nanaimo Ry. C.R.C. no. 324; and Kettle Valley Ry. C.R.C. no. 80.

Canadian Northern Railway's Interests in the Niagara Peninsula.

The two railway bills in which the Canadian Northern Ry. interests were concerned, which formed the subject of considerable controversy in the House of Commons, viz., the Niagara, St. Catharines & Toronto Ry., and the Toronto, Niagara & Western Ry., have been passed by the Dominion Parliament, having been given their third readings in the Senate, May 16 and 17 respectively. The opposition directed against the measures came from the Hydro Electric Power Commission of Ontario, the municipalities associated with it in the proposal to build an extensive system of radial railways, and the City of Toronto.

The Niagara, St. Catharines & Toronto Ry. Act extends for two years the time for starting construction, and for five years for completing the following lines, from Port Colborne to Fort Erie and from Fort Erie to the city of Niagara Falls, from Niagara Falls to the town of Niagara, and from Niagara to St. Catharines, from Welland to Brantford, and an extension of the St. Catharines & Niagara Central Ry. to the Niagara River at or near Fort Erie, and an extension to Toronto passing at or near Hamilton.

The Toronto, Niagara & Western Act grants similar extensions of time for building the following lines: From in or near Toronto into or near Hamilton, but not along any portion of Burlington Beach, in Wentworth County, without the Burlington Beach Commission's consent,

or along any portion of the Beach in Halton County without the Nelson Township's consent; from in or near Hamilton, to or near Grand Island in the Town of Niagara Falls, and with the consent of the proper authorities, beyond the limits of Ontario to a point in New York State, a branch of the railway authorized to St. Catharines through or near Thorold, and also to Port Colborne, and from a point in or near Hamilton, or in Halton County, through or near Brantford, Woodstock, London and Chatham to or near Windsor. A clause was added that the line entering Toronto shall be built upon or within the location for the Canadian Northern Ontario Ry., extending westerly and north-westerly from the joint section to be used by the C.N.O.R. and the C.P.R. at North Toronto, or such variation therefrom as the Board may direct on the application of the C.N.O.R. or the City of Toronto. One of the company's previous Acts authorized it to sell electric power with the consent of the municipalities. The company agreed to this provision being repealed.

The discussion in the Commons brought about an understanding that route plans for new railways should be subject to the sanction of the Board of Railway Commissioners, instead of to that of the Minister of Railways, as formerly. A Government bill was passed in the House to amend the Railway Act in this regard, but the Senate, after considerable discussion in committee, directed the redrafting of the bill May 12. The bill was left on the minutes of the Senate Railway Committee to be taken up at the call of the chair. The Committee did not meet before Parliament prorogued and the bill therefore died.

Scientific Research Work for Canada.

—The C.P.R. management has arranged with Arthur D. Little, Inc., chemists and chemical engineers, Boston, Mass., who are establishing a Canadian Research Bureau in Montreal, to mobilize scientific and chemical men throughout Canada, to make a complete investigation of the mineral, metal, hydro electric and chemical resources, in order to secure the practical application to industry of many minerals heretofore neglected or exported to other countries for manufacture, of by products in existing industries, and of other natural resources which are neglected or insufficiently exploited. Among other things investigated will be the waste of straw, in the wheat fields, of flax fibre, of lumber, a large proportion of which is wasted in the forest or at the mill. The opportunities for investment of capital in tungsten, molybdenite, graphite, oil shale, manganese, magnetite, talc, feldspar and other minerals will be investigated. The results obtained for the C.P.R.'s special information will be disseminated from time to time in bulletin form.

The Port Arthur Ont., Public Utilities Commission has taken over the management of the city waterworks, which makes the total value of public utilities under one management about \$4,000,000. Since its establishment about a year ago the commission has made reductions of about \$30,000 a year in salaries and other operating expenses. The commissioners are: W. P. Cooke, Chairman; G. H. Rapsey, who is at present also acting as Secretary Treasurer; I. L. Matthews, and A. E. Wideman, with the mayor as ex officio. As the commissioners are devoting a large amount of time to the work, a suggestion to allow them some compensation is under consideration.

Railway Development, Projected Lines, Surveys, Construction Betterments, Etc.

Canadian Pacific Ry.—We are officially advised that fair progress has been made with the erection of the new passenger station at Quebec. It is expected that it will be completed about the middle of July.

We are officially advised that the company has decided to do a considerable amount of broken stone ballasting. The programme for this year includes from Place Viger, Montreal, to Ste. Therese, Que., double track, 19.9 miles; as much as possible between Windsor Street, Montreal, and Smiths Falls, Ont., double track, 128.5 miles, and from North Bay to Verner, Ont., 33.9 miles. The stone will be obtained from Terrebonne on the Quebec Subdivision, the Canadian Northern Ry.'s Mount Royal Tunnel at Montreal, Staynerville and Cap St. Martin on the Ottawa Subdivision, Smiths Falls, Ont., and from Worthington on the Lake Superior Division.

Tenders are under consideration for the purchase and removal of the old C.P.R. North Toronto station building. The new station on Yonge St. is rapidly approaching completion.

We are officially advised that the company has no present intention of erecting an addition to the roundhouse at Weyburn, Sask., as stated in recent press reports.

We are advised that ballasting on the section of the Weyburn-Lethbridge line from Foremost to Pakowki, Alta., 25 miles, is being gone on with, and it is expected to be ready for traffic early in June. Nothing has been done as yet in the way of construction to connect up the line running east, now ending at Pakowki, with the line running west, ending at Attaman, and we are officially advised that the company has not decided to extend the line farther east.

At the company's Lake Louis Hotel, Alberta, a kitchen addition is being built at the back of the concrete wing and the former ballroom is being converted into a dining room.

About 140 ft. of Shed No. 4, at the C.P.R. docks at Vancouver, have been taken down to make room for the new 50 ton crane to be erected. A contract for the concrete foundation for the crane, is reported let to the Cotton Co. (Ltd.), Vancouver. It is expected that the new crane will be erected by the end of June. It will be electrically operated and will be an addition to the dock equipment, the present 15 ton crane being retained.

D. C. Coleman, Assistant General Manager, Western Lines, stated when in Vancouver recently, that the management had appointed a committee, consisting of himself as chairman; F. W. Peters, General Superintendent, British Columbia Division; F. C. Clendenning, Division Freight Agent; J. W. Troup, Manager, B.C. Coast Service; and F. K. Lee, to draft a comprehensive scheme for handling the increased business at the port; that it would be prepared for a series of units, and that as business developed the units would be taken up one by one.

Canmore Ry.—The Alberta Legislature has incorporated a company with this title to build a railway from the C.P.R. to No. 2 mine, Canmore, with branches to the Georgetown Colliery and No. 1 mine, Canmore, in tps. 24 and 25, ranges 10 and 11 west of the 5th meridian. (Mar., pg. 106.)

Central Vermont Ry.—Southern New England Ry.—Application has been made

to the Massachusetts Legislature by the Central Vermont Ry. for power to acquire the Southern New England Ry. The latter company was organized under C.V.R. auspices to build a railway from a point on the C.V.R. to Boston, and to Providence, R.I. A considerable amount of construction was done on the latter line, in face of the New York, New Haven & Hartford Ry.'s opposition, but construction was suspended about three years ago. Some matters in connection with the line were made the subject of a judicial investigation by a United States court, and the present application is said to be in connection with the settlement of the situation.

Dominion Government Ry. to Hudson Bay.—The Dominion Parliament has voted a further sum of \$3,000,000 on capital account towards the construction of terminal facilities and elevators for this railway, running from Pas to Port Nelson, Man. In connection with this vote, the acting Minister of Railways informed the House of Commons, May 3, that the total expenditure on the railway up to Feb. 29, was \$10,404,182.26, and on the terminal facilities at Port Nelson, \$4,861,071.69, a total of \$15,265,960.95. The estimated cost of the line complete is \$16,000,000, and the estimated cost of the terminals \$10,000,000, a total of \$26,000,000. The line will have a total length of 425 miles. There will be some dredging necessary at the entrance to the harbor. The channel is from half a mile to 15 miles wide, 19 or 2 ft. deep at low water, with a 16 ft. rise at spring tides. This will give a depth of water sufficient for all navigation purposes. The last report on construction sent into the department gave the following details: Miles of steel laid, 241; miles of steel laid in sidings, 24; miles of steel laid on temporary track, 33; grading completed (with exception of a few depressed grades), 378 miles; track surfaced, 225 miles. (April, pg. 106.)

Essex Terminal Ry.—The Ontario Legislature has ratified a bylaw of the city of Windsor granting a right-of-way and other rights to the company. (Feb., pg. 138.)

Gananoque and Arnprior Ry.—The Ontario Legislature has extended the time which the company may build its projected railway from Gananoque to Arnprior, with branches from Moreton to Lyndhurst, and from an unnamed point to Ottawa. The company has power to use electricity or other motive power, as well as steam for operation. (Mar., pg. 106.)

Grand Trunk Ry.—The installation of automatic signals from Bonaventure station, Montreal, to Coteau Junction, Que. and also between Toronto and Hamilton, Ont., is said to be under consideration. (Mar., pg. 182.)

The company is building a spur from its Georgetown-Allandale line into the site of Camp Borden, the military training camp which is being established on the Angus pine plains near Barrie, Ont.

Great Northern Ry.—The Vancouver City Council issued a permit, May 28, for the foundation work, at the new G. N.R. station at False Creek, at an estimated cost of \$30,000. The contractors are Grant Smith and Co. and McDonnell Ltd., and the work is being done under the supervision of the company's architect, F. L. Townley. A. H. Hogeland, Chief Engineer, is reported to have said

in a recent interview that every effort will be made to complete the station by June, 1917, the date specified in the Board of Railway Commissioners' order.

In a recent interview A. H. Hogeland, Chief Engineer, is reported to have said construction work is under way on the extension of the Abbottsford line which will afford connections at Sumas Landing with the Canadian Northern Pacific Ry. and the other link at Hope. It is expected this piece of line will be ready for operation in July.

The G.N.R. is at present operating northward from Spokane into British Columbia as far as Princeton. The extension of service to the coast will be effected by the joint section between Coquihalla Summit and Hope, built by the Kettle Valley Ry., a C.P.R. division over which it will have running rights. The branch from Spokane runs north to Marcus and thence to Grand Forks, Midway, Oroville, Keremeos, Princeton and Coalmont. The extension of the line to the coast over the Hope Mountains will bring the Boundary, Similkameen and other districts of the interior into much closer communications with Vancouver.

High River and Hudson Bay Ry.—The Alberta Legislature has extended the time within which the company may build its projected railway east and west from High River. (April, pg. 138.)

The Kettle Valley Ry. extension from Otter Summit to Hope, B.C., near which place connection is made with the C.P.R. main line, is expected to be opened for traffic at an early date. The stations on the line, with their distances from Penticton, are:—Brodie, mileage 113.9; Joliet, mileage 119.8; Coquihaltan, mileage 127.6; Romer, mileage 134.1; Iago, mileage 139.6; Portia, mileage 144.4; Jessica, mileage 149.9; Lear, mileage 155.0; Othello, mileage 158.9; Hope, mileage 164.3. The mileage from Penticton to the actual connection with the C.P.R. is 166.7 miles. The opening of this line will give the C.P.R., which leases the K.V. lines, a new through line from Winnipeg to Vancouver, via Dunmore, Nelson, Midway, Penticton and Hope. The distance will be 1,625 miles, the distance between the same points, via the main Transcontinental line being 1,484 miles.

Lockport Ry.—The Nova Scotia Legislature has incorporated a company with this title to build a railway from Lockport, N.S., to a junction with the Halifax & South Western Ry. main line, four miles. It is provided that the town of Lockport may acquire the railway at the actual cost of the undertaking. The project is promoted by residents of the town.

The Legislature refused to incorporate a company with the title of the Lockport Transportation Co., which, among other things, asked power to build a railway from Lockport to a junction with the Halifax & South Western Ry. The proposed capital of the company was \$800,000, and the estimated cost of the railway was \$100,000. The Premier, in criticizing the bill, said permission was being asked "to do about everything under the sun," and it was not advisable to tie up the interests of the whole town with a railway that would be dependent for its success or non-success on the other business interests of the company.

Michigan Central Rd.—We are officially advised that the plans for the erection of buildings at Montrose, Ont., include a 20 stall locomotive house, with machine

shop, and elevator, oil house, fuel oil house, sand house and office building. The engine house will be of brick and mill construction on a concrete foundation; the oil house of concrete, fireproof construction; while the office building and machine shop will be of brick. The locomotive house will have a depth of 97 ft at one end, and where it connects with the machine shop a depth of 114 ft. 8 in. The machine shop will be 123 ft. 10 in. x 37 ft. 3 in., the coal house adjoining being 15 x 30 ft.; the oil house 42 x 22 ft.; the fuel oil house 37 x 13 ft.; and the office building 51 x 23 ft.; and 85 ft. turntable with the necessary tracks will be provided. We are advised that the contract for these buildings has been let to the Wallbridge Aldinger Company, Detroit, Mich., and that work has been started and will probably be completed this year.

Sarnia, Ont. people want to induce the company to locate terminal buildings there. To do this the existing line from St. Thomas to Courtright would have to be extended to Sarnia, or a line built from Petrolia. (May, pg. 182.)

Minneapolis, St. Paul and Sault Ste Marie Ry.—A press report states that a contract has been let to the Foley Bros. Construction Co., Minneapolis, Minn., for building an ore dock at Ashland, Wis., of steel and concrete. It is estimated to cost \$1,000,000.

Montreal Central Terminal Co.—According to local reports, the company, which is represented by C. N. Armstrong, proposes to lay its plans for a central terminal station before the Montreal Board of Control at an early date. The proposal is to build a large station in a central location, into which all the railway lines entering the city would run their trains, with a tunnel under the St. Lawrence River to connect the north and south shores. It is claimed that if the proposal were carried out all level crossings would be eliminated, and the city would be saved a very large sum, while some of the present terminal stations could be given over exclusively for freight traffic purposes. It is proposed to use electric traction exclusively in the terminal and connecting lines. The cost of the terminal proposal alone is put at between \$30,000,000 and \$40,000,000. (Sept., 1914, pg. 403.)

Prince Edward Island Ry.—Tenders were received by the Railway Department, Ottawa, up to May 31 for constructing a station, water tank, locomotive house, transfer platform, standpipe pit, ashpit and turntable foundation for the Carleton Point car ferry terminal.

Quebec Bridge.—The Dominion Parliament has voted \$3,450,000 on account of the construction of the bridge across the St. Lawrence River near Quebec. The total expenditure to Oct. 31, 1915, was \$13,257,621.85, of which \$10,473,346.38 was on account of the bridge now under construction. The Chief Engineer has advised the Department that it is expected to have the final spike driven in the superstructure during next autumn. The acting Minister promised to arrange, if possible, for members of Parliament to be present on the occasion of the floating into position of the span which will connect up the central cantilevers. This span is the largest ever attempted to be floated into position, in the history of bridge construction, and it will require the utmost delicacy and skill, much more so than if the work was being done in non-tidal waters. (Mar., pg. 106.)

Big River to Lac La Rouge, Sask.—In connection with the development of

the fishing industry in Northern Saskatchewan, C. R. Rouse, was in Regina, May 15, discussing the prospects for building a narrow gauge railway from Big River, at the present terminus of the Canadian Northern Ry. Prince Albert-Shellbrook Branch, to Isle a la Cross, Lac La Rouge and Lac la Plouge, 200 miles. The fisheries are being developed and the catch is carried by teams to Big River and dispatched to the markets by train. The country is being settled by men of the fishermen-farmer type, and Mr. Rouse says he has secured the right of way for the railway, and has control of sufficient rolling stock to operate the section from Big River to Isle a la Cross, if he could get money to provide and lay the rails. The grading would be done largely by the settlers.

Taber Transit Co.—The Alberta Legislature has extended the time within which the company may build the various lines authorized, reaching from Taber, and connecting with others in the vicinity, the C.P.R. Suffield Branch, and with Bow City. (April, pg. 139.)

Toronto, Hamilton & Buffalo Ry.—We are officially advised that construction has been started on the extension of the recently opened line from Smithville to Dunnville, from the latter point to Port Mackland, about five miles. The contractors for grading are Fitch & Douglas, Dunnville, Ont., and the tracklaying and other work will be done by the company's own staff. There are no engineering features of any importance on the line, which is expected to be completed and ready for operation about July 15. (April, pg. 139.)

Freight and Passenger Traffic Notes.

Representatives of the Canadian Freight Association will hold a conference with shippers at Regina, Sask., June 5, to discuss the checking of freight on private sidings.

The Canadian Government Railways will put in operation on June 16, for the summer, the St. Lawrence special, running from Montreal to points along the St. Lawrence River on the Intercolonial Ry.

The Burlington, Ont., municipal council is asking the Hamilton Radial Ry., and the G.T.R., to reduce fares between that place and Hamilton. A large number of Burlington residents go to Hamilton daily for business purposes, and desire to have commutation tickets issued.

The Victoria and Island Development Association is undertaking an extensive plan of advertising Vancouver Island as a tourist resort, and is in communication with 200 tourist agencies in the United States with a view of securing tourists' travel.

A Nova Scotia press report states that the C.P.R. is arranging to operate a train ferry service from St. John, N.B., to Digby, N.S., which will enable it to operate its trains directly over the Dominion Atlantic to Windsor Jct., and thence over the Intercolonial into Halifax.

The Grand Trunk Ry. is arranging to establish a suburban train service from Collingwood to Pine Station, Ont., in connection with the opening of the Camp Borden there. Local press reports state that it is proposed to put on five additional trains a day.

An arrangement has been made with the Grand Trunk Pacific Ry. by which shippers to points on the Edmonton, Dunvegan & British Columbia Ry., Alberta & Great Waterways Ry., and the Central Ry. of Canada, will be able to use the

G.T.P.R. sheds at Edmonton, Alta., without extra charge.

The C.P.R. put in operation, May 20, a regulation increasing from 10 to 30 days, the stop over privilege on through tickets to Vancouver, on the following points:—Banff and Lake Louise, Alta.; Field, Glacier, Revelstoke, Secamons and Balfour, B.C.

The Pacific Great Eastern Ry. resumed on April 25 its train service from Squamish to Clinton, B.C., which had been abandoned since the severe snowstorms at the end of January and early in February. A train service is being given on alternate days. On the completed section of the line from North Vancouver towards Squamish, an hourly service in either direction was inaugurated May 4, as far as Whytecliffe, the present end of track.

The C.P.R. new North Toronto station will probably be opened for traffic between the middle and end of June. Train 24 for Montreal, and train 23 from Montreal, both with Ottawa sleeping cars, will continue to use the station, as will also the following trains: the Rideau from Toronto to Ottawa, and the York from Ottawa to Toronto, which now use Toronto Union Station; train 707 from Toronto to Owen Sound, train 708 from Owen Sound to Toronto; train 713 from Toronto to Teeswater, and train 714 from Teeswater to Toronto. A new train leaving Lindsay in the morning, and returning in the afternoon, will also use the new station.

Toronto, Hamilton and Buffalo Ry. Employees Wages.

The award of the board of conciliation in the arbitration proceedings affecting Toronto Hamilton and Buffalo Ry. employees was issued May 6. The arbitrators were Judge Snider, Chairman; G. S. Kerr, K.C., representing the company, and J. Simpson, Toronto, representing the men. The matters coming before the board affected the machinists, blacksmiths, boilermakers and railway carmen. Following is a summary of the findings:

The men of the four trades mentioned get a nine hour working day, and a Saturday half holiday in these departments, except the locomotive house, where a 10 hour day is recognized all over the Dominion. Time and a half will be paid for all overtime. Recognition of a committee appointed by the men to settle all disputes was agreed upon. The rates per hour established are as follows: Machinists, 36c.; machinists' helpers, 20 to 22c.; boilermakers, 36c.; boilermakers' helpers, 20 to 22c.; blacksmiths, 31 to 36c.; blacksmiths' helpers, 22c.; tinnerns, 28 to 30c.; tinnerns' helpers, 25c.; pipe fitters, 25 to 34½c.; pipe fitters' helpers, 22c.; car carpenters, 26 to 30c.; car repairers, 20 to 22c.; a month; car inspectors' helpers, 20c.; car cleaners, 20c.; car inspectors, 70 to 75c. a month. The new schedule is dated back to March 1, including overtime, which will have to be paid to the employees for all hours worked over the regular day's work as specified in the board's decision.

The award was not favorably received either by the company or the employees. The company announced May 1, that certain increases would be made in the wage scale, ignoring the award and refusing to recognize the men collectively. Although efforts were made to bring the parties together, the carmen, blacksmiths, boilermakers and machinists at the company's shops in Hamilton, numbering about 120, struck work May 20.

Further Dominion Government Aid to Canadian Northern and Grand Trunk Pacific Railways.

The items in the supplementary estimates submitted to the House of Commons May 7, providing for loans of \$15,000,000 to the Canadian Northern Ry. and \$8,000,000 to the Grand Trunk Pacific Ry., were passed by both Houses of Parliament.

The loan to the Canadian Northern is repayable on demand, with interest, payable half yearly, at 6%. The loan is to be used for expenditure made, or to meet indebtedness incurred in paying interest upon the securities of the companies included in the C.N.R. system, having priority over the guaranteed securities guaranteed by the statutes of 1914, chap. 20, and instalments of principal of equipment securities and upon construction; the loan to be secured by mortgage upon the C.N.R. undertakings, and so much of the loan as may be applied for the benefit of any company included in the C.N.R. system, to be secured in addition by mortgage upon the undertaking of such company; the mortgages to contain such terms and conditions as the Governor in Council may approve. The disposition of the loan is subject to the direction of the Governor in Council.

The loan to the Grand Trunk Pacific is also repayable on demand with interest, payable half yearly, at 6%. The loan is to be used in paying securities of the company, to meet the deficit in operation, and for the purchase of rolling stock; the loan to be secured by mortgage upon the company's undertakings, containing such conditions and terms as the Governor in Council may approve; the disposition of the loan is subject to the direction of the Governor in Council.

The Finance Minister's Statement.

The Minister of Finance made a statement to the House of Commons, May 8, in connection with the matter on the motion to go into committee of supply. He stated that the loans were, in the Government's view, necessitated from consideration of public interest by reason of the critical position of the financial affairs of the two companies. In 1914, it was the view that the proceeds of the securities for \$45,000,000 guaranteed for the Canadian Northern, and of the \$16,000,000 guaranteed for the Grand Trunk Pacific would have been sufficient for the purposes then in view. Closely following upon the execution of the trust deeds, war broke out, which resulted in the practical closing of the markets of the world to securities other than those of the various governments for the prosecution of the war. In order to carry out the intention of Parliament, the Dominion Government made loans in Dominion notes to the Canadian Northern for \$10,000,000, and to the Grand Trunk Pacific for \$6,000,000, security being taken in guaranteed stocks, the transaction subsequently being ratified by Parliament. Owing to the continuance of the war, the two companies have had to place the guaranteed securities upon the market at lower prices than would otherwise have been the case. In addition to this \$45,000,000 of guaranteed securities, the Canadian Northern had \$55,000,000 of marketable securities, and has not been able to realize upon them within \$10,500,000 of the amount it was calculated would have been the case; the G.T.P.R. being in proportionately the same position. This resulted in the delay of a year in the completion of the C.N.R., the transcontinental line which was only

linked up in Dec., 1915. The country's interests were so intimately bound up with those of the two companies that it was necessary for the country to give them some relief, the policy of the Government since the outbreak of the war having been to maintain stability and to promote confidence in the financial and economic situation of Canada.

There were three courses open to the Government, one to withhold and to permit the two companies to go into the hands of receivers, the second to permit default and take physical possession of the two systems, that is, to foreclose the mortgages to the Dominion; and the third to grant aid by way of loan. After giving these alternatives the most careful and lengthy consideration, the Government decided upon the last mentioned, as a temporary expedient to meet the situation until such time as the whole problem, involved in the suggestion of taking over the lines, or of granting permanent aid in other directions have been considered and solved. In conclusion, he said: "The House will observe that the loans which we propose, of \$15,000,000 and \$8,000,000 respectively, are repayable upon demand, so that, in a sense, we have a control of the situation through those demand loans. We are charging 6% interest, the Dominion Government being able to borrow at slightly less than that figure. We realize that the security upon which we are making these loans to both of the railway systems in question is rather slender, and therefore we have a vital interest in the administration of the affairs of these two railways. It is our intention, in order that we may be kept fully informed, pending our investigation by experts, which I have announced, as to the condition and administration of these companies, to appoint three directors of the C.N.R. and three directors of the G.T.P.R."

The Canadian Northern's Position.

The Minister stated that the C.N.R. net earnings for the year ended June 30, 1915, were \$6,000,000, and it is estimated that the net earnings for the year to end June 30, 1916, will be \$9,000,000. The fixed charges upon the system, including the constituent and subsidiary companies, aggregate \$15,000,000. Since the passing of the act of 1914, the net earnings of the company have been applied to the payment of fixed charges, and payments upon construction account. The terms of the legislation of 1911 and 1914, under which the Dominion Government might be called upon to pay interest for three years (the amount so paid to be added to the mortgage indebtedness), upon \$35,000,000 of the C. N. Ontario Ry. securities, issued in respect of the Montreal-Ottawa-Port Arthur line, and of the \$45,000,000 of securities issued under the Act of 1914, would be called into effect this year, so that from July 1 next the C.N.R. will call upon the Dominion Government to provide \$4,500,000 a year in respect to these securities. A similar provision has been inserted in the Act respecting the bonds guaranteed by British Columbia, and that Government will have to provide, from July 1, for the interest of the bonds so guaranteed. Therefore, for the next financial year the fixed charges, so far as they have a bearing upon the financing of the company, will be reduced to about \$11,000,000 a year. The public credit of the Dominion and the provinces is pledged

to the extent of \$211,000,000 of the \$383,000,000 of the company's securities issued. In addition to these securities, there are \$17,000,000 of equipment bonds, and \$92,000,000 of temporary loans and current obligations. The reason why there are so many temporary loans and current obligation is that in the earlier stages of the war short term obligations only could be sold, and the method of financing adopted has been the pledging of securities against short date notes. The company assumes it will be able to extend existing notes, or to place new notes to retire them. In regard to current obligations, unless aid was given by the Government, the company would not be able to carry through the year. The estimate was that the minimum assistance upon which the company would be able to make arrangements to finance during the coming year was \$15,000,000. This amount is to be used as follows:—For expenditures made or indebtedness incurred to meet interest payments maturing due upon securities in priority to the securities of \$45,000,000 guaranteed by the Dominion Government under the legislation of 1914; to meet instalments of equipment bonds and on construction account.

The Grand Trunk Pacific's Position.

The G.T.P.R., the Minister said, was completed from Winnipeg to Prince Rupert. The company had issued securities guaranteed by the Dominion for \$78,000,000, and in addition the Dominion had loaned the company \$25,000,000. The provinces of Saskatchewan and Alberta had guaranteed the bonds of a subsidiary company for building branch lines for \$13,000,000, so that, in addition to the loans, the public credit of the Dominion and of the two provinces named was pledged to the extent of \$115,000,000, while the G.T.R. Co. has guaranteed additional securities of the G.T.P.Ry. and of its subsidiaries for \$97,000,000. The G.T.R. also held notes of the G.T.P.R. and its subsidiaries for \$25,000,000 for advances. The G.T.R. now finds itself unable to extend any further aid to the G.T.P.R. and is further confronted with the necessity of providing for betterments, improvements and terminal facilities upon its own system, involving the expenditure of large sums. This condition of affairs led to the writing of a letter to the Government by A. W. Smithers, Chairman of the G.T.R. Board, in Dec., 1915, which is referred to further on. The G.T.P.R. is now out of the construction stage. The fixed charges for this year are \$7,200,000, while there has been a deficit upon operating and maintenance account and for exceptional repairs, of \$2,000,000, and the company is in arrears in the payment of interest to the Dominion Government on the \$25,000,000 of loans, the amount of such arrears on April 1, being \$1,350,000. The Dominion Government will be called upon to pay this year, without recourse, the interest on the Mountain Division bonds. For the interest charges the Government is responsible for \$2,400,000 a year, and the G.T.R. is responsible for \$4,000,000 a year. The amount to be provided for to meet the fixed charges, deficit in operation, and repairs will aggregate \$9,000,000 a year. In considering the future of the line, it must be borne in mind that in addition there must be taken into consideration improvements, betterments

and rolling stock, which will be required, estimated by the Railways Department at anything from \$3,000,000 to \$5,000,000 after a year or two. The minimum amount upon which it was estimated the company would be able to continue as a solvent concern was \$8,000,000.

Returns to Parliament.

A number of returns and financial statements respecting the affairs of the two companies were laid before Parliament. They set forth in considerable detail the information given about the companies by the Finance Minister in the speech quoted above.

Canadian Northern.—The statement of the financial position of the company to April 15, showed a total amount of stock outstanding of \$358,770,798.68, distributed as follows: Guaranteed by Dominion Government, \$104,613,247.77 out of \$104,746,586.72 authorized; guaranteed by Province of Ontario, \$7,859,997.50, out of \$7,860,000 authorized; guaranteed by Province of Manitoba, \$25,501,865.81, out of \$25,665,339.99 authorized; guaranteed by Province of Saskatchewan, \$14,762,546.64, out of \$18,600,000 authorized; guaranteed by Province of Alberta, \$18,950,361.99, out of \$21,744,250 authorized; guaranteed by Province of British Columbia, \$39,953,123.85, out of \$47,975,000 authorized; unguaranteed securities, \$103,944,920.39, out of \$109,000,525.48 authorized; land grant securities, \$21,416,539.99 authorized and issued. The equipment securities outstanding amount to \$17,302,500; and there is also outstanding \$25,000,000 of 5% convertible debenture stock, which brings the total outstanding liabilities up to \$401,073,298.

Total securities issued... \$383,770,798

Imperial Rolling Stock Co.

bonds	17,302,500	
Less issued outside of mileage and equipment:		\$401,073,298
Issued on terminals, elevators, express, telegraph and subsidiary companies...	\$40,338,224	99
Issued on land grant, etc.	21,416,539	99
5 per cent. income convertible D.S.	25,000,000	00
		\$ 86,754,764
Total issued on mileage and equipment		\$314,318,534
Mileage (including 394 miles leased)		
lines	9,993	
Total issue per mile exclusive leased lines		\$ 32,744
Total issue per mile including 5 per cent. income stock		35,348
Total fixed charges exclusive of subsidiary companies and land securities	12,989,059	
Fixed charges per mile	1,299	

The Dominion and British Columbia Governments have undertaken to pay interest on securities for 2 and 3 years after lines are in operation to extent of \$4,514,501, which temporarily reduces total fixed charges on mileage to \$8,474,552 and to \$848. per mile.

The issue of \$45,000,000 of bonds authorized by the Dominion Act of 1914, realized \$36,759,265.10 when pledged or sold, with \$133,333.33 unissued. It was estimated that the issue would produce \$41,052,999, so that owing to the war conditions the company realized \$4,293,734 less than was anticipated. The proceeds of the issue were applied in accordance with the terms of the Act.

The company's liabilities at April 15, were \$92,450,883, made up as follows: London loans on securities, \$29,411,964; Dominion Government and sundry loans, \$16,214,066; one and two year notes, \$14,000,000; bills payable, \$7,300,000; net amount of temporary loans, \$16,395,418; due contractors, \$5,912,497; audited vouchers and pay rolls, etc., less cash on hand, \$3,206,940.

Grand Trunk Pacific.—The first and most important document on the return

relating to the G.T.P.R. is the letter from A. W. Smithers, Chairman of the Board of Directors, G.T.R., dated Dec. 10, 1915, in which he referred to an offer he had made to the Government, which offer he repeated with the G.T.R. directors' approval. This was "that the Government should take over the G.T.P.R. as from Jan., 1916, with all its branch lines, together with its development company, and other subsidiary companies, with all the assets, the G.T.R. to surrender to the Government the whole of the common stock of the G.T.P.R. on condition of the Government relieving the G.T.R. of all liabilities in respect of the G.T.P.R., its branch lines, its development company, and other subsidiary companies, and repaying to the G.T.R. any money advanced by the G.T.R. to the G.T.P.R., or its branch lines, and development company, and other subsidiary companies." After summarizing the financial position, Mr. Smithers went on to say: "We have done our utmost to meet the heavy financing which has been necessary, and the difficulty of which has been immensely increased by the disastrous war conditions. We are now 'at the end of our tether' with regard to G.T.P. financing. . . . I beg you to remember that the G.T.P.R. has been built through a most difficult country, at a cost which is moderate considering the high character of the work, and the satisfactory low grade maintained in crossing the mountains, and it must be also remembered that all the work has been done under the supervision of the Government engineer, and all expenditure has been audited by the Government auditors."

An accompanying statement shows that the par value of bonds issued and outstanding is \$193,251,104.86, out of a total authorized issue of \$221,015,496, the amount realized being \$184,698,507.69. The amount of the interest payable on the bond issue for 1916 is \$7,206,844.20, the guarantees for the same having been given by the Dominion Government in respect of \$2,678,833.82; by the G.T.R., \$3,989,250.22; by the Province of Saskatchewan, \$395,176.32. and by the Province of Alberta, \$143,583.84. The interest payment includes interest on \$55,170,720 Mountain Division bonds assumed by the Dominion Government. To the interest payment there is added the estimated loss in operation on the Mountain Division for one year, \$1,200,000; exceptional expenditure on Mountain Division for maintenance and providing necessary facilities for the operation of the line for one year, \$720,000; loss in operation of branch lines for one year, \$300,000; miscellaneous current expenditure, \$950,000; to provide 50 refrigerator cars at \$4,000 each, \$200,000; making a total with the interest of \$10,576,844.20.

The total expenditure upon the construction and interest payments to Feb. 20, was \$197,129,391.82 in respect of the main line and branches, and there was realized from bond issues \$184,698,507.69; the difference being \$12,430,884.13.

The total amount due to the G.T.R., including the difference between bond issue and cost, amounts to \$14,385,821.37, of which \$801,783.54 is due by the G.T.P.R.; \$13,369,537.83 is due by the G.T.P. Branch Lines Ry., and \$214,500 by the G.T.P. Saskatchewan Ry. The advances to the G.T.P. Development Co. amount to \$11,793,907.46, making the total sum due to the G.T.R. \$26,179,728.83, against which the G.T.R. holds notes of the G.T.P. Branch Lines, the G.T.P. Saskatchewan Co., and the G.T.P. Development Co., for the amounts due by them,

and is also entitled to \$3,868,100 of bonds guaranteed by the Provinces of Saskatchewan and Alberta, representing expenditures made on branch lines and terminals when the amount has been finally agreed upon.

Under the G.T.P.R. Guarantee Act of 1914, the company was authorized to issue \$15,962,666.66 of bonds (in sterling, £3,280,000). It was estimated that these would have realized 91½%, but owing to war conditions they only realized, when pledged or sold, 79.6%, making a difference between the estimated and actual proceeds of \$1,874,734. The other papers on the returns had reference to the expending of the proceeds of these bonds.

Discussion in House of Commons.

When the estimates came up in committee of supply in the House of Commons, May 9, the Minister of Finance, in reply to questions said the G.T.P.R., according to the report of Sir Collingwood Schreiber, the General Consulting Engineer to the Government, was not up to the standard set, viz., the G.T.R. between Montreal and Toronto. It was not likely to be brought up to that standard for some years to come. It was estimated that it would take from \$4,000,000 to \$5,000,000 to bring the line measureably to the standard set. The item was finally passed by the House of Commons, May 12.

In regard to the C.N.R. prospects, the Minister submitted an estimate of the company's earnings up to 1920, supplied by D. B. Hanna, Third Vice President. The total net earnings for the year ended June 30, 1915, were \$6,623,000; for 1916, the estimate was \$9,770,000; for 1917, \$11,500,000; for 1918, \$15,120,000, and for 1919 and 1920, \$17,700,000. The Duluth, Winnipeg & Pacific Ry., the bonds of which are guaranteed by the C.N.R., is one of the most profitable, if not the most profitable, of the company's lines. There is at credit, \$1,300,000 of the proceeds of the Montreal-Port Arthur loan, and about \$4,300,000 of the \$45,000,000 loan, so that with the funds to be provided by this present loan, the contractors will be provided for.

When the vote came up for further consideration, May 13, Hon. W. Pugsley moved to add the following: "Before making such loan, the Governor in Council shall require the company to give to His Majesty the King an option to acquire at any time within five years from the date thereof the railways and other property of the company and of all other railways and property included in the Canadian Northern Ry. system at such price as to the Governor in Council may seem reasonable under existing circumstances." On the resuming of the discussion, May 15, the chairman of committee ruled the amendment out of order, and the discussion proceeded on the main question, the item being passed.

The Dominion Parliament also, in the further supplementary estimates, voted \$10,000 to provide for a continuous audit on behalf of the Dominion, commencing May 1, of the revenues and expenditures of the two companies to which the loans have been granted.

Daylight Saving in Winnipeg.—In connection with the working of the daylight saving bylaw put in force in Winnipeg recently, the C.P.R. put the clock forward an hour, as required, at its shops, and then asked the men to vote on whether the changed time be retained, or a return made to standard time. Of the 1,800 or so employees, over 1,200 voted in favor of standard time.

Railway Rolling Stock Notes.

The C.P.R. has built a portable rail saw at its Angus shops, Montreal.

Canadian Government Railways have ordered 500 steel frame box cars, 50 tons capacity, from Canadian Car & Foundry Co., and 500 similar cars from Eastern Car Co.

Canadian Government Railways are reported to have ordered 20 second hand sleeping cars, 10 second hand tourist cars and 1 second hand dining car from Pullman Co.

The C.P.R. has ordered 21 steel ore cars from Hart-Otis Car Co., two scale testing cars from Canadian Fairbanks-Morse Co., and two ditching machines from American Hoist & Derrick Co.

The Asbestos and Asbestic Co. has received one 6 wheel saddle tank locomotive, with cylinders 13 by 16 ins., and drivers 33 ins. diam., and weighing 59,800 lbs., in working order, from Canadian Locomotive Co.

The Canadian Northern Ry., between Apr. 11 and May 15, received 1 first class passenger car from National Steel Car Co., and 4 compartment observation cars and 3 dining cars from Canadian Car & Foundry Co.

The acting Minister of Railways stated in the House of Commons May 8 that within the next three or four weeks thereafter he would award contracts for from \$3,000,000 to \$4,000,000 worth of cars for Canadian Government Railways.

The Canadian Locomotive Co. has delivered 9 decaped locomotives to the Russian Government, completing the contract for 50 for the Russian Imperial Railways. They were fully described and illustrated in Canadian Railway and Marine World for January.

Canadian Government Railways, since Apr. 14, have received 1 steel sleeping car for Intercolonial Division, from National Steel Car Co., and 22 stock cars, for Transcontinental Division, from Canadian Car & Foundry Co. A description of the latter cars, with an illustration, is given on another page in this issue.

Canadian Government Railways have purchased from Hotchkiss, Blue & Co., Chicago, 2 first class passenger cars, 65 ft. long inside, with wide vestibules; 1 first class passenger car, 60 ft. long inside with wide vestibule, and 2 dummy end baggage cars, 65 ft. long, all with steel underframes and steel sheathed. The passenger cars are mahogany finish, olive green plush upholstery, mantle gas lights, and have smoking rooms.

The Algoma Eastern Ry. has ordered 125 Otis general service cars from Hart-Otis Car Co. They are being built at the Canadian Car & Foundry Co.'s Dominion works. Following are the chief dimensions:

Length over end sills	24 ft. 4½ ins.
Length inside	22 ft. 5 ins.
Width over all	9 ft. 11¼ ins.
Width inside	9 ft. 6 ins.
Height	5 ft.
Height from rail	9 ft. 4 13/16 ins.
Doors on each side	4
Capacity	100,000 lbs.

Canadian Government Railways have ordered 30 Mikado (2-8-2) locomotives, with superheaters, from Canadian Locomotive Co., for delivery in November. Following are the chief details:—

Weight in working order on drivers	213,500 lbs.
Weight in working order, total	283,000 lbs.
Wheel base, rigid	16 ft. 3 ins.
Wheel base, total	35 ft. 1 in.
Wheel base, engine and tender	68 ft.
Heating surface, firebox	242 sq. ft.
Heating surface, tubes	3,398 sq. ft.
Heating surface, total	3,640 sq. ft.
Grate area	56.6 sq. ft.

Driving wheels, diam.	63 ins.
Driving wheel centres	Cast steel
Driving journals	Main, 11 x 20 ins.; others 10 x 12 ins.
Cylinders, diar. and stroke	27 by 30 ins.
Boiler, type	Extended wagon top, radial stay
Boiler pressure	180 lbs.
Tubes, no. and diar.	240 2 ins.; 32 5½ ins.
Tubes, length	20 ft.
Brakes	Westinghouse American
Superheater	Locomotive Superheater Co., Type A
Rear frame	Cradle type
Trailing truck	Radial type with side bearings
Cab	Steel with vestibule
Weight of tender loaded	166,000 lbs.
Tank capacity	9,000 U.S. gals.
Tank, type	Water bottom with vestibule connection
Coal capacity	12 tons
Truck, type	Pedestal, equalized
Truck wheels, diar.	34 ins.
Wheel, type	Steel tired, retaining ring, cast steel centres
Journals	M.C.B. 6 by 11 ins.
Brake beam	High speed with M.C.B. heads

Death of Lieutenant-Colonel Greenwood.

A cable from London, Eng., May 15, announced the death of Lieut.-Col. Henry Smith Greenwood, M.Can.Soc.C.E., who had been suffering from an internal growth for some time, and was for a while in a sanitarium in the south of France. He was born near Kingston, Ont., Apr. 27, 1861, and graduated from the Royal Military College of Canada, with special mention in civil engineering, in June, 1882. He entered railway service in Aug., 1882, and was, to December in the same year, rodman on construction, Canada Atlantic Ry.; from 1883 to 1888 he was in the service of the Department of Railways and Canals, his work being as follows: Jan. to May, 1883, running transit and in charge of survey party traversing inland lakes and small rivers and taking soundings of same; May to Nov., 1883, with survey party making changes in location and establishing permanent bench marks, Nov., 1883, to Jan., 1884, on staff of the construction of locks at Fenelon Falls, Ont., May to Aug., 1884, with survey party running instruments on trial lines; Aug., 1884, to May, 1885, superintending construction of dam across the Otonabee River, Lakefield, Ont.; May, 1885, to Sept., 1886, superintending construction of lock and three small dams near Burleigh Falls, Ont.; Sept., 1886, to Jan., 1887, in office making up estimates; Sept., 1887, to Jan., 1888, on leave in England visiting engineering works; Jan. to Apr., 1888, office work; May, 1889 to Apr., 1892, Assistant Engineer, Cornwall Canal enlargement, with supervision of two sections; Apr., 1892, to June, 1894, Resident Assistant Engineer, Cornwall Canal enlargement, with supervision of three sections, the work consisting of three locks, three weirs, culverts, bridge, deepening and widening of canal and new banks where necessary; in June, 1894, he was transferred from the Cornwall Canal to the Peterborough and Lakefield Division of the Trent Canal, to take charge of surveys and prepare plans for the letting of contracts for the work, consisting of 6 locks, 5 bridges, 5 dams and several smaller works connected with canal construction.

He held a Royal School of Infantry first class certificate and the long service decoration. In 1886 he was captain and adjutant in the 4th Hussars; in 1889, Lieutenant-Colonel of the 3rd Dragoons, and went on the reserve of officers in 1907. He served in the South African war with the 1st Regiment Canadian Mounted Rifles in 1900, and in the native rebellion in Natal in 1906. In the South African war he served through Lord Roberts' campaign in the Orange Free

State, and after the entry of the British into Johannesburg he was appointed to reorganize the railways in the Transvaal. Later, on the removal of Major Waghorn, R.E., who was in charge of the military railways under Sir Percy Girouard, to another point, in control of the engineering of all the Transvaal lines, he was placed in charge, under Major Waghorn, of the lines in western Transvaal, that is, all lines west of Pretoria, and remained in that position until the conclusion of the war, when he was appointed Resident Engineer in charge of the lines in western Transvaal and northern Orange River Colony, and remained in that capacity until his return to Canada in 1909. On the conclusion of the war he organized and commanded a railway regiment from amongst the officials and employees of the Central South African Railways, which included all arms, was well equipped and disciplined and held a high reputation. During the Zulu rebellion drafts from this regiment took part, but he was unable to obtain the necessary leave to join them, as there was a great deal of reconstruction and new work going on on the railways at that time. In June, 1910, he was appointed Assistant Chief Engineer of Construction, Eastern Lines, Canadian Northern Ry., resigning in April, 1914, on going to live in England. He was elected a member of the Canadian Society of Civil Engineers in Dec., 1906, and a member of the Institute of Civil Engineers in Mar., 1904. Since the commencement of the present war, and until a short time before his last illness, he was engaged at the War Office in London.

A. F. Stewart, M.Can.Soc.C.E., Chief Engineer, Eastern Lines, Canadian Northern Ry., Toronto, who was associated with him in railway work in South Africa, as well as later in Canada, wrote us recently in reference to him, as follows:—"He was an able engineer, very thorough and practical in all his work. His modesty and reticence prevented him from being very well known except to his intimate friends, but these knew him to be a man of marked ability and the highest character, entirely to be relied upon both in work and in friendship."

Canadian Overseas Railway Construction Corps.—The C.P.R. has sold two 65-ton steam shovels and two self propelling extension track pile drivers to be used by the Canadian Overseas Railway Construction Corps, which is commanded by Lt.-Col. C. W. P. Ramsey, formerly Engineer of Construction, C.P.R. The Corps has built a considerable mileage of track at strategic points and is all the time making surveys for further construction. The work has often to be done under fire, but fortunately there have been no serious casualties, though there have been many narrow escapes. Lt.-Col. Ramsey and Major C. L. Hervey have been mentioned in dispatches, and 18 of the non commissioned officers and sappers who enlisted when the corps was established have received commissions in the Royal Engineers.

The International Railway Fuel Association held its annual convention at Chicago, Ill., May 15 to 18, when papers dealing with the following subjects were read and discussed,—care of locomotives and boilers with regard to fuel economy, psychology of the firemen, interpretation of coal analysis with special reference to non-combustibles, the transportation department and fuel economy, the functions of a railway fuel inspector, method of illustrating the components of coal, and fuel distributing record system.

Three Quebec Railways to be Acquired by Dominion Government.

The Dominion Parliament has passed an Act authorizing the Governor in Council to acquire, under the provisions of the statutes of 1915, chap. 16, upon such terms as may be approved, the following lines of railway, together such equipment and properties as may be deemed necessary for the operation thereof:—(1) The line commonly known as the Quebec, Montmorency & Charlevoix Ry., extending from St. Paul St., Quebec, to St. Joachim, 43.2 miles; (2) the Quebec & Saguenay Ry., extending from a junction with the last named line at St. Joachim, to Nairn Falls, Charlevoix County, Que., 62.8 miles; (3) the Lotbiniere & Megantic Ry., extending from Lyster to St. Jean des Chaillons, Lotbiniere County, Que., 30 miles. The consideration to be paid for these lines, and for the "equipment and appurtenances" is to be the value thereof as determined by the Exchequer Court of Canada.

The Act of 1915, under which the purchase of these lines is to be effected, provides that the Minister of Railways, subject to the authority of the Governor in Council, may "construct, purchase or lease, either with or without an agreement to purchase, in whole or in part, any line or lines of railway . . . in Quebec, New Brunswick, Nova Scotia or Prince Edward Island . . . which in his opinion can more conveniently and usefully be operated as part of the Government Railways System, or which may be deemed necessary or desirable for the more efficient operation of the said system. A copy of the lease or contract shall be laid before Parliament; that no line shall be leased or otherwise acquired exceeding 200 miles in length, and that no contract for the construction of a line exceeding 25 miles long shall be entered into or the purchase price of any railway paid without a vote of Parliament. No line can be purchased unless it directly connects with some part of the then existing Government Railway system.

The acting Minister of Railways, in introducing the measure. May 15, explained that the capital expenditure on the Quebec, Montreal & Charlevoix Ry. was reported to be, to Mar. 31, \$2,992,209.89; the capital cost of the Lotbiniere & Megantic Ry. was \$349,208.85; and the cash expenditure on the Quebec & Saguenay Ry. was claimed to be \$4,872,315.42, while there was due for right of way, etc., \$461,000, a total of \$5,333,315.42. The latter company had received \$248,000 in subsidies, of which \$116,000 was still in the hands of a branch company, and the Quebec provincial subsidies had not been paid over. The estimated cost of completing the line is \$700,000. The Lotbiniere & Megantic Ry. was to be taken over at \$330,000, and the Quebec, Montmorency & Charlevoix Ry. was to be taken over for the bond issue of \$2,500,000. An amendment was adopted, on the motion of the acting Minister of Railways, to the section providing for the fixing of the value of the line as follows: "Said value to be the actual cost of said railway, but not to exceed \$4,465,000, exclusive of bonded indebtedness which is to be assumed by the Government, but not to exceed in all \$2,500,000." In other words, the Government assumes \$2,500,000 of bonds of the Q.M. & C.R., pays \$330,000 for the Lotbiniere & Megantic Ry., and will pay the actual cost of the Quebec & Saguenay Ry., not to exceed,

however, \$4,135,000. A motion to read the bill a third time six months hence was defeated, May 10, and the measure went to the Senate, where it was passed the following day.

The Quebec, Montmorency & Charlevoix Ry. was originally built as a steam railway, extending, according to the Dominion Railway statistics for the year ended June 30, 1915, from Quebec to Cap Tourmente, 27.50 miles, and having 3.32 miles of branch lines. The line subsequently passed into the hands of the Quebec Ry., Light and Power Co., and is known in the electric railway field as the Q.R.L. & P. Co., Montmorency Division. The statistics of electric railway mileage issued by the Dominion show the following mileage:—Length of first main track, 28.60 miles; length of second main track, 9.80 miles; sidings and turn-outs, 3.00 miles; total mileage of track, 41.40 miles. We are officially advised by the Quebec Ry., Light and Power Co., that the Montmorency Division main line extends to Cap Tourmente, 30 miles. From Quebec to Montmorency, approximately 7 miles, the line is double tracked, and in addition there are some six odd miles of sidings, crossing points, etc., making a total of 43.20 miles. These figures do not include either the Beaufort line, or the upper level line to Montmorency Falls. The difference existing between the returns given to the Department of Railways is largely owing to the fact that the line is not electrified beyond St. Joachim station, and certain of the crossing sidings are also not electrified. The company operates both a steam and an electric railway service over the line, the financial results of the operation of which for the year ended June 30, 1915, will be found in the tables in other parts of this issue. The company had at June 30, 1915, in its steam service, eight freight locomotives; 4 first and 2 second class passenger cars; 2 baggage express and postal cars, and 12 other cars in passenger service; 38 box, 78 flat, one stock, 13 coal, and 44 other cars in freight service, and three cars in the company's service. For the electric service there were on the Montmorency division, 15 closed passenger cars and two sweepers. The line does a very large pilgrimage business in summer between Quebec and the shrine of Ste. Anne de Beaupre.

The Quebec & Saguenay Ry. Co. was incorporated to build a railway from Quebec, or near thereto, to Tadousac, via Murray Bay. For a number of years the project hung fire, but after the charter had been acquired by Sir Rodolphe Forget, things began to move, and the project became linked up with the Q. Ry., L. & P. Co. In March, 1911, a contract was let to O'Brien & Doheny to build a line from Cap Tourmente to Murray Bay wharf, 56 miles. About the same time a contract was let to the Bishop Construction Co. to build 7.50 miles of railway from Murray Bay wharf to a pulp mill at Pointe a Pic. The site of this mill is approximately at Nairn Falls. Track on this line was laid in 1911 and this represents all the track laid in connection with the company's project. O'Brien & Doheny started construction in June, at St. Joachim, mileage 25, on the Q.M. & C. Ry., and continued grading until Aug., 1912, when work ceased. At that time work had been completed to subgrade on about 95% of the 54.54 miles under the

firm's contract. No track had been laid except for construction purposes, but steel for 10 miles of track was reported to be on hand.

The Lotbiniere & Megantic Ry. was built under a Quebec charter, and extends from Lyster on the G.T.R. to St. Jean des Chaillons, 30 miles. The results of its operations for the year ended June 30, 1915, will be found in the railway statistics table in another part of this issue. The company was reported to have owned at that date 4 freight locomotives, 2 first and 2 second class passenger cars, 1 box, 24 flat and 1 other car in freight service, and one caboose. The company received subsidies from the Dominion amounting to \$96,000; and from Quebec, \$126,994. In 1907, the Quebec Legislature incorporated the Quebec Eastern Ry. to build a railway from Sherbrooke to the site of the Quebec Bridge, with power to arrange for the operation of the line into Quebec; a branch line to Lyster, with power to acquire the Lotbiniere & Megantic Ry.; a branch to Lime Ridge, and unnamed branch lines. Extensions of time for the building of the lines were granted from time to time, but nothing was ever done. It was subsequently said that the Q.E. Ry. charter was acquired by the Forget interests, and that the control of the L. & M. Ry. was held by friendly interests, in that it was operated as part of the Quebec Ry., Light, Heat & Power Co.'s system, under that company's General Manager, H. G. Matthews.

The Dominion Parliament has voted in further supplementary estimates, \$4,000,000 to provide the amount required to be paid for the Quebec, Montreal & Charlevoix Ry., the Quebec & Saguenay Ry. and the Lotbiniere & Megantic Ry., and for the equipment, appurtenances and properties used in connection with such railways, as acquired under the statute, and to provide for the cost of completing, equipping and operating the railways—the operating expenses to be chargeable to revenue account. The Minister of Finance, in explaining the vote, stated that the amount involved in the acquiring of the Lotbiniere & Megantic Ry., was \$330,000. There had been expended about \$5,000,000 on the Quebec & Saguenay Ry., which started at St. Joachim on the Quebec, Montmorency & Charlevoix Ry., and both these railways were being acquired in the public interest. If it was necessary that the Q. & S. Ry. should be acquired in order that a large amount of capital should not go to waste, it was necessary that the Q.M. & C. Ry. should be acquired in connection with it, in order that there might be a continuous railway from Quebec to Nairn Falls. So far as the Q., M. & C. Ry. is concerned, the Government assumes the obligation of \$2,500,000 of 5% bonds, and so far as the Q. & S. Ry. is concerned, the Government acquires it on a basis of actual cost, not to exceed some \$4,000,000, which is said to be less than the actual cost.

C.N.R. Honor Roll.—The Canadian Northern Ry. has had prepared an honor roll containing the names of all the officials and employees who have enlisted for overseas service, the roll containing about 1,000 names. It is very handsomely designed, the border containing the arms of all the provinces.

Charges Against G.T.R. Conductor Dismissed.—The cases against William Neil of Niagara Falls, Ont., for alleged theft of money received for fares, were dismissed by the Hamilton magistrate, May 10. The conductor had been in G.T.R. service for 44 years, and is 63 years old.

Mainly About Railway People Throughout Canada.

G. A. Walton, General Passenger Agent, Western Lines, C.P.R., has removed his family from Chicago to Winnipeg.

W. McWood, ex-Superintendent Car Department, Grand Trunk Ry., Montreal, who is 86 years of age, is reported to be very ill.

J. E. M. Firby, who died at Winnipeg, May 1, aged 65, was formerly Foreman of Bridges and Buildings, Canadian Northern Ry. there.

Hon. Frank Cochrane, M.P., Minister of Railways and Canals, returned to Canada early in May, after being absent for several weeks through ill health.

F. H. Phippen, K.C., General Counsel, Canadian Northern Ry., and Mrs. Phippen, left Toronto, May 15, for New York, whence they sailed for England.

W. H. Miller, General Paymaster, Wabash Ry., died suddenly from appendicitis at St. Louis, Mo., Apr. 30, the day prior to that fixed for his wedding.

J. A. Whyte, of Toronto, formerly of Ottawa, who founded the Whyte Railway Signal Co., has enlisted as a sergeant major in the Beavers Battalion, which is being organized in Toronto.

James Adie, local agent, C.P.R. Telegraphs, St. Catharines, Ont., received notice May 3, that his eldest son, Flight Lieutenant H. M. E. Adie, had died from injuries received in action.

G. A. Suckling, son of **H. E. Suckling**, Treasurer, C.P.R., Montreal, was married at Toronto, May 9, to Miss **A. M. Angstrom**, daughter of **A. Angstrom**, Naval Architect, Canadian Northern Ry., Toronto.

V. J. Melsted, A.M.Can.Soc.C.E., heretofore Engineer of Water Service, C.P.R., Winnipeg, has been appointed by the Manitoba Board of Health, to conduct analyses of all public water supplies in the province.

Stephen L. Henderson, who was on the C.P.R. engineering staff in Vancouver, and who enlisted in the Canadian Expeditionary Forces, and was at the front as a lance corporal, is reported missing. He is a son of **Elmes Henderson**, Toronto.

W. G. Connolly, City Passenger and Ticket Agent, Grand Trunk Pacific Ry., Vancouver, B.C., was referred to in our last issue, under the heading of Birthdays of Transportation Men in May, as representing the C.P.R. instead of the Grand Trunk Pacific Ry.

Geo. W. Stevens, President, Chesapeake and Ohio Ry., Richmond, Va., who was the guest in Montreal of Sir Frederick Williams-Taylor, General Manager, Bank of Montreal, was entertained at luncheon at the Mount Royal Club, May 5.

Capt. George McNair, killed in action in France, recently, was at one time chief clerk in the Freight Department, G.T.R., Hamilton, Ont., and at the outbreak of war was in Grand Trunk Pacific Ry. service in the west.

William A. Gardner, President, Chicago and North Western Ry., Chicago, Ill., died at Barnstable, Mass., May 11. He had been in ill health for some time, and went to his summer home, where he died, towards the end of April.

F. C. Salter, European Traffic Manager, G.T.R., London, England, who underwent two rather serious operations for abdominal trouble recently, was re-

ported early in May to have recovered sufficiently to enable him to take up his work again.

Douglas Charles O'Keefe, whose appointment as City Passenger Agent, C.P.R., Tacoma, Wash., was announced in our last issue, was born at Grand Forks, N.D., Sept. 29, 1887, and was from June, 1907, to Apr., 1916, in the Passenger Department, C.P.R., there.

Lieutenant O. P. Hertzberg, son of **A. L. Hertzberg**, M.Can.Soc.C.E., Division Engineer, Ontario Division, C.P.R., Toronto, was married there, recently, to Miss **J. C. Morris**. Lieutenant Hertzberg, who was wounded while on active service, is home on leave to recuperate.

George Moberly, who died at the General and Marine Hospital, Collingwood, Ont., Apr. 27, aged 86, was a member of



C. A. Cotterell,
Superintendent, District 2, British Columbia
Division, Canadian Pacific Railway.

the Royal Commission appointed in 1886 to enquire into and report as to the advisability of instituting a board of railway commissioners.

James McGown, Jr., whose appointment as Locomotive Foreman, C.P.R., Rogers Pass, B.C., was announced in our last issue, was born at Vancouver, B.C., Feb. 19, 1893, and entered C.P.R. service in August, 1909, since when he served an apprenticeship and served as machinist.

Jno. M. Egan, who was the first General Superintendent of the Western Division, C.P.R., at Winnipeg, from Jan. 1882 to Sept. 1, 1886, has resigned the presidency of the Kansas City Railway & Lighting Co., Kansas City, Missouri, and is living at Amboy, Ill., near which he has a large farm.

H. W. Wheatley, elder son of **A. W. Wheatley**, President, Lima Locomotive Corporation, Lima, Ohio, and until recently Vice President, Canadian Locomotive Co., Kingston, Ont., is taking an aviation course at Hammondsport, N.Y., and when qualified will report at Ottawa for overseas service.

Major T. C. Irving, Jr., of Toronto, Vice President of Robert W. Hunt & Co., Ltd., consulting and inspecting engineers, etc., who has been at the front almost since the beginning of war, and is now officer commanding no. 2 Field Co., Canadian Engineers, First Canadian Division, is to be married in England in June to Miss **Jessie Murray** of Toronto.

Capt. Ian M. W. Sinclair, of the 13th Battalion, son of **Angus Sinclair**, railway contractor, Toronto, was slightly wounded in the shoulder while in action recently, but has returned to duty. He was previously wounded in the knee at the Orchard battle. His younger brother, **Lt. Angus Sinclair**, is in a hospital in France suffering from shrapnel wounds.

G. J. Weidman, whose appointment as City Passenger Agent, C.P.R., Cleveland, Ohio, was announced in our last issue, was born at New York, N.Y., Apr. 20, 1889, and entered C.P.R. service June 11, 1911, since when he has been, to Oct. 1912, stenographer, New York; Oct. 1912 to Nov. 1913, assistant ticket agent, New York; Nov. 1913 to Jan. 1916, City Passenger Agent, Washington, D.C.

William Cotter, until recently President and General Manager, Pere Marquette Rd., Detroit, Mich., who has been appointed President and General Manager, Manufacturers' Ry. and St. Louis and O'Fallon Ry., St. Louis, Mo., was from 1896 to 1899, Superintendent, Eastern Division, G.T.R., Montreal; 1899 to July 1, 1901, Superintendent, Western Division, same road, Detroit, Mich.

F. W. Peters, General Superintendent, British Columbia Division, C.P.R., Vancouver, is suing the Dominion Shipbuilding, Engineering & Dry Dock Co., Ltd., North Vancouver, regarding the purchase by him of 100 shares in the company. He asks for a declaration that the subscription was obtained by fraud and that he is not a shareholder, or in the alternative for a declaration that the shares are fully paid up.

Miss Katherine Hughes, who came out from England shortly after Sir William Van Horne's death to write his biography, after spending some time in Montreal left early in April and occupied some weeks in visiting various places in the United States, particularly his birthplace at Joliet, Ill., and also Toronto and other Canadian points. She has returned to Montreal with a large amount of valuable information to be used in her book.

C. R. Moore, who has been appointed Assistant to Vice President, Construction, Maintenance and Operation, G.T.R. (**H. G. Kelley**), entered G.T.R. service at Hamilton, Ont., in 1883, and has served in the Mechanical Accountant's office, and the Motive Power, Car, and Transportation departments. In 1911, when chief clerk to the Superintendent, at Toronto, he was appointed chief clerk to Vice President Kelley, and has remained in that position until his present appointment.

William P. Hutchinson, who has been appointed Resident Manager, The Macdonald, Grand Trunk Pacific Ry., Edmonton, Alta., was born at Penzance, England, Aug. 31, 1884, and after spending about two years with the American Audit Co., New York, was on July 2, 1913, appointed auditor, Chateau Laurier, G.T.R., Ottawa, remaining in that position until Aug. 1913, when he was appointed auditor, The Fort Garry, G.T.P.R., Winnipeg,

continuing as such until May 1, the date of his present appointment.

W. B. Bamford, who has been appointed District Freight Agent, C.P.R., Toronto, was born at Belleville, Ont., Sept. 10, 1863. Prior to his present appointment he was Division Freight Agent, Atlantic Division, St. John, N.B., which position he held from Apr., 1911, when his former title of General Freight Agent, Atlantic Division, held from June, 1910, was abolished. Before the last mentioned date he was District Freight Agent, London, Ont. He was entertained to luncheon at the Union Club, St. John, N.B., May 8, before leaving for Toronto.

Charles R. Moore, who has been appointed Assistant to Vice President, Construction, Operation and Maintenance, G.T.R., Montreal, was born at Hamilton, Ont., Oct. 12, 1867, and entered G.T.R. service in 1883, since when he has served successively, as junior clerk, Mechanical Accountant's office, Hamilton, Ont.; and in the Motive Power, Car, Maintenance of Way, and Transportation Departments at Montreal, and at various terminals on the system. In 1911, being then chief clerk to Superintendent, Toronto, he was appointed chief clerk to Vice President Kelley, and remained as such until his present appointment.

Thomas E. Sands, who has been appointed Freight Traffic Manager, Minneapolis, St. Paul & Sault Ste. Marie Ry., Minneapolis, Minn., was born at Albany, N.Y., Jan. 4, 1869, and entered railway service in June, 1886, since when he has been, to 1888, clerk, Chicago, St. Paul, Minneapolis & Omaha Ry.; 1888 to 1909, successively, contracting freight agent, travelling freight agent, chief clerk, Freight Traffic Department, and Assistant General Freight Agent, Minneapolis, St. Paul & Sault Ste. Marie Ry.; Apr., 1909, to the date of his present appointment, General Freight Agent, same road, Minneapolis, Minn.

John D. McAuley, whose appointment as Travelling Freight and Passenger Agent, Grand Trunk Pacific Ry., Juneau, Alaska, was announced in our last issue, was born in Plantagenet, Ont., June 11, 1884, and entered railway service Oct. 1904, since when he has been, to Dec. 1908, in Local Freight Department, G.T.R., Montreal; Dec. 1908 to June 1911, in Freight Claims Department, G.T.R., Montreal; June 1911 to Sept. 1913, in Foreign Freight Department, G.T.R., Montreal; Sept. 1913 to Sept. 1914, City Freight Agent, Grand Trunk Pacific Ry., Vancouver, B.C.; Sept. 1914 to Mar. 1, 1916, City Freight Agent, G.T.P.R., Regina, Sask.

William Gordon Powell, whose appointment as Freight and Passenger Agent, Grand Trunk Pacific Ry., Skagway, Alaska, was announced in our last issue, was born at Galt, Ont., June 27, 1891, and entered railway service Oct. 1908, since when he has been, to Nov. 1909, clerk, C.P.R., Brandon, Man.; Nov. 1909 to Nov. 1910, excursion clerk, C.P.R., Brandon, Man.; Nov. 1910 to Nov. 1911, chief clerk, District Passenger Agent's office, Grand Trunk Pacific Ry., Winnipeg; Nov. 1911 to Feb. 1912, Assistant City Passenger Agent, G.T.P.R., Winnipeg; Feb. to Dec. 1912, City Passenger Agent, G.T.P.R., Winnipeg; Dec. 1912 to June 1913, Travelling Passenger Agent, G.T.R. and G.T.P.R., Winnipeg; June 1913 to Feb. 1916, City Passenger and Ticket Agent, G.T.P.R., Regina, Sask.

Flight Lieutenant Trafford Jones, who was killed somewhere in France or Flanders recently, while on patrol duty, by

being shot through the head, was born at Toronto, Oct. 19, 1887, and was educated at Upper Canada College and the Faculty of Applied Science, Toronto University, graduating from the latter in 1908. He was engaged for some time in the Canadian Northern Ry. Mechanical Department offices, Toronto, leaving in 1911 to promote Canadian Brakeshows, Ltd. He joined the Army Service Corps in Feb., 1915, going to England in May, 1915. Early this year he was transferred to the Royal Flying Corps and was on active service at the front for four months. He leaves a widow, a daughter of Alfred W. Smith, Toronto, and one child.

L. Mulkern, who has been appointed Division Freight Agent, Atlantic Division, C.P.R., St. John, N.B., was born at London, Ont., June 18, 1871, and entered C.P.R. service in Mar., 1890, since when he has been, to 1897, operator, Freight Department, Toronto; 1897 to 1901, inward freight clerk, London, Ont.; June 1, 1901, to June, 1903, clerk in General Freight Agent's office, Toronto; June, 1903, to Apr., 1908, canvassing freight agent, chief clerk to General Freight Agent, and Travelling Freight Agent, Toronto, consecutively; Apr., 1908, to June, 1910, chief clerk to General Freight Agent, Through Traffic, Toronto; June, 1910, to Jan., 1914, District Freight Agent, London, Ont.; Jan., 1914, to May 15, 1916, District Freight Agent, Toronto.

Thomas Francis Rahilly, whose appointment as acting Trainmaster, Algoma Central & Hudson Bay Ry., Sault Ste. Marie, Ont., was announced in our last issue, was born at Diorite, Mich., Oct. 6, 1892, and entered railway service June 22, 1908, since when he has been, to July 20, 1908, section hand, Chicago & North Western Ry., Michigamme, Mich.; July 23, 1908, to May 11, 1913, freight clerk, Duluth, South Shore & Atlantic Ry., St. Ignace, Mich.; May 12 to Aug. 27, 1913, clerk in Audit Office, same road, Marquette, Mich.; Aug. 28 to Nov. 2, 1913, chief clerk to Yardmaster, Sault Terminals, same road, Sault Ste. Marie, Ont.; Nov. 3, 1913, to Nov. 30, 1914, clerk in Comptroller's Office, Algoma Central & Hudson Bay Ry. and Algoma Eastern Ry., Sault Ste. Marie, Ont.; Dec. 1, 1914, to Apr. 15, 1916, Travelling Auditor, same companies.

H. D. Cameron, whose appointment as Mechanical Engineer, Canadian Northern Ry., Toronto, was announced in our last issue, was born there Sept. 23, 1879, and was educated at the Montreal public and high schools, and graduated from McGill University with the degree of B.Sc. (Mechanical Engineer) in 1901. He entered railway service in the summer of 1899 as mechanical apprentice, G.T.R. shops, Montreal, and continued there during vacations and after graduation until 1902, since when he has been, to 1903, in drawing office, Mechanical Department, Canada Atlantic Ry., Ottawa; 1903 to 1905, Assistant Engineer, Montreal Water and Power Co., Montreal; 1905 to 1906, on engineering staff of Gulf, Colorado and Santa Fe Ry., Cleburne, Tex.; 1906 to Apr. 1, 1916, in drawing office, latterly as chief draughtsman, Mechanical Department, Canadian Northern Ry., Winnipeg.

T. Collins, who has been appointed Superintendent, District 2, Ontario Division, C.P.R., London, entered C.P.R. service, Sept. 2, 1885, since when he has been, to Mar. 7, 1887, brakeman, West Toronto, Ont.; Mar. 7, 1887, to Aug. 1, 1896, conductor, West Toronto, Ont.; Aug. 1, 1896, to Sept. 1, 1899, construction

trainmaster, Guelph and Goderich Branch; Sept. 1 to Oct. 15, 1897, Trainmaster, London, Ont.; Oct. 15, 1897, to Jan. 1, 1908, construction trainmaster, double tracking, Montreal to Smiths Falls, Ont.; Jan. 1 to Apr. 15, 1908, Trainmaster, Smiths Falls, Ont.; Apr. 15, 1908, to June 1, 1909, construction trainmaster, double tracking, Montreal to Smiths Falls, Ont.; June 1, 1909, to June 1, 1912, Assistant Superintendent, Smiths Falls, Ont.; June 1 to Dec. 1912, Superintendent, District 2, Lake Superior Division, Chapleau, Ont.; Dec., 1912, to May 1, 1913, Superintendent, District 4, Ontario Division, Toronto.

Jules E. Morazain, who has been appointed Superintendent, District 1, National Transcontinental Ry., Quebec, Que., was born at Wheatland, Que., July 31, 1875, and entered C.P.R. service May 3, 1890, since when he has been, to May 24, 1890, clerk, Drummondville, Que.; Aug. 1, 1890, to Jan. 8, 1891, operator, Foster, Que.; Jan. 9 to Aug. 12, 1891, operator, Richfort, Vt.; Aug. 12, 1891, to Aug. 15, 1892, undertook a commercial course; Aug. 15 to Sept. 26, 1892, operator, C.P.R., Sutton, Que.; Sept. 26, 1892, to Feb. 8, 1894, operator, Highlands, Que.; Feb. 9, to July, 1894, operator, Richfort, Vt.; July to Oct., 1894, relieving operator at various points; Oct., 1894, to May 27, 1895, operator, Highlands, Que.; May 27, 1895, to Sept. 24, 1901, agent, Highlands, Que.; Sept. 24, 1901, to Nov. 3, 1908, agent, Mile End, Que.; Nov. 3, 1908, to Jan. 31, 1913, General Agent, Operating Department, Quebec, Que.; Feb. 1 to Dec. 6, 1913, Assistant Superintendent, District 3, Eastern Division, Quebec, Que.; Dec. 6, 1913, to May, 1916, Assistant Superintendent, Montreal Terminals, C.P.R.

James M. MacArthur, whose appointment as Superintendent, District 1, Manitoba Division, C.P.R., Kenora, Ont., was announced in our last issue, was born at Toronto, Dec. 8, 1885, and entered C.P.R. service July 16, 1902, since when he has been, to Oct. 1, 1902, clerk to Division Engineer, Toronto; Oct. 1, 1902, to Mar. 1, 1903, clerk to Chief Dispatcher, Toronto; Mar. 1 to July 1, 1903, clerk to Superintendent, Moose Jaw, Sask.; July 1, 1903, to Aug. 10, 1907, chief clerk to Terminal Superintendent, Toronto; Aug. 10, 1907, to Aug. 5, 1909, assistant chief clerk to General Superintendent, Ontario Division, Toronto; Aug. 5, 1909, to Aug. 9, 1910, assistant chief clerk to Second Vice President, Winnipeg; Aug. 9, 1910, to Feb. 21, 1912, chief clerk to Second Vice President, Winnipeg; Feb. 21, 1912, to Oct. 3, 1913, chief clerk to General Superintendent, Manitoba Division, Winnipeg; Oct. 3, 1913, to Aug. 1, 1914, Trainmaster, Medicine Hat, Alta.; Aug. 1, 1914, to Feb. 24, 1915, Terminal Trainmaster, Calgary, Alta.; Feb. 24, to Mar. 23, 1915, acting Superintendent, Cranbrook, B.C.; Mar. 23 to Oct. 31, 1915, Terminal Trainmaster, Calgary, Alta.; Oct. 31 to Dec. 1, 1915, acting Superintendent, Nelson, B.C.; Dec. 1, 1915, to Mar. 31, 1916, acting Superintendent, Lethbridge, Alta.

Geo. O. Somers, who has been Secretary of the Canada Bond Corporation, Ltd., Toronto, for the last three or four years, and who was appointed member of the Traffic Rates Bureau for western railways, Chicago, Ill., recently, was born at Barrie, Ont., July 10, 1860. He entered railway service in 1875, since when he was consecutively to 1879, telegraph operator, Northern Ry. of Canada, assistant agent, relief agent, station agent and superintendent's clerk, same road; 1880 to 1882, engaged in other business at Chicago; 1883 to 1885, successively clerk,

general freight office, acting general baggage agent and chief clerk, general passenger and ticket department, Canadian Pacific Ry., at Winnipeg, Man.; 1886, chief clerk, general passenger and ticket department, Michigan Central Rd., at Chicago; 1887, travelling passenger agent, Duluth, South Shore & Atlantic Ry., at Marquette, Mich.; to Sept., 1894, successively chief clerk, general passenger and ticket department, chief clerk, general traffic department, and Assistant General Freight Agent, Great Northern Ry.; Sept., 1894, he was appointed General Freight Agent, same road, and later transferred to a similar position on the Chicago Great Western Rd., which he resigned in June, 1912, to take up the position in Toronto which he has just relinquished.

Allan Purvis, who has been appointed General Superintendent, Eastern Division, C.P.R., Montreal, was born at Batavia, Java, June 29, 1878, and was educated at the Merchant Taylor's School, Liverpool, Eng. He entered C.P.R. service in Vancouver, B.C., at an early age, and was

from Aug. 1890 to Feb. 1891, messenger, Stores Department; Feb. to Nov. 1891, storesman; Nov. 1891 to Sept. 1892, junior clerk, Vancouver, B.C.; Sept. 1892 to Aug. 1893, timekeeper, Donald, B.C.; Aug. 1893 to Oct. 1894, clerk, Vancouver, B.C.; Oct. 1894 to Mar. 1895, assistant storekeeper, North Bend and Kamloops, B.C.; Mar. 1895 to Sept. 1896, clerk and operator, Car Service and Fuel Department, Vancouver, B.C.; Sept., 1896 to Jan. 1899, Chief Clerk, Fuel Department, Vancouver, B.C.; Jan. 1899 to Feb. 1908, chief clerk to General Superintendent, Pacific Division, Vancouver, B.C.; Feb. to Nov. 1908, Superintendent, District 4, Central Division, Souris, Man.; Nov. 1908 to Oct. 1909, Superintendent, District 3, Pacific Division, Nelson, B.C.; Oct. 1909 to Oct. 1911, Local Manager, Fraser Valley Branch, British Columbia Electric Ry., Vancouver, B.C.; May 1912 to Feb. 1915, Manager of Interurban Lines, same company, New Westminster, B.C.; May 1915 to May 1, 1916, Superintendent, District 2, Ontario Division, C.P.R., London, Ont.

a debt, at the end of this war, of \$1,000,000,000. In time of peace it would not be a light undertaking to bring about the nationalization of all the railways of Canada; it would certainly not be a light undertaking to do so in time of war. But this situation must be faced; there must be an end of this annual coming to the Government by these two railway companies for relief. The policy which we have adopted has been stated to be no policy. I say it is the true policy in the situation in which we find ourselves. We are not in a position to say what should be the permanent solution of Canada's railway problem. We are in this position, that we do not want these railway companies to collapse. The policy which has been before this committee, and I know it has met with approval in this House, is the true policy at this time, and it is not the less the true policy because it provides temporarily for the situation. It bridges time, it enables these roads to continue—these roads which are so vital, so essential for the welfare of this country—until such time as, upon the best advice that we can get, we shall be able to suggest some permanent solution, which I believe will probably involve the taking over by this Government of one or more of the existing railway systems, and which, as I stated, may involve later on the nationalization of all the railway systems of Canada."

Royal Commission to Enquire into the Railway Situation.

The Dominion Parliament has voted \$150,000 to provide for an inquiry and a report upon the railway situation in Canada. In explaining the vote in the House of Commons, May 15, the Minister of Finance said the terms of the commission had not been settled. In general terms, the purpose the Government has in view, is that a full report shall be made upon the physical and financial conditions of the railways in Canada and upon the general railway situation, in order that it might be in a position to adopt a policy which would prevent recurring visits for temporary aid, and settle the railway situation in permanent fashion. The powers which will be given to the commission will have to receive careful consideration by the Government in order that the end in view may be accomplished. The commission will furnish the Government with information respecting the physical and financial conditions relating to the railway companies of Canada, and also, it is hoped, will give suggestions and advice as to what distribution or rearrangement, or linking up of lines and systems would give the best economic results for the enormous amount of capital which has been expended. The Government has in mind a commission clothed with wide powers which will bring in a comprehensive report, as a result of which it will be known what policy, at least upon the Government's view, should be adopted to settle the railway situation with which the country is confronted. The problem cannot be sidestepped. The loans given at the present session are a measure of temporary assistance, and there is every reason to believe that if steps are not taken to provide a permanent solution, the same situation will recur. The personnel of the commission has not been settled by the Government. It is not an easy task to settle upon men of ability. Such men might be found in Canada,—others suggest they are to be found only in the United States,—but the problem of finding them the Government must address itself to. The commissioners will be asked to advise generally as to the railway situation, and to report as to what arrangement, distribution, or linking up of the lines or systems will

give the best economic results. The Government cannot make any commission a dictator; they cannot abdicate the functions of the Government or of Parliament in favor of any commission. But it is hoped the commission will give the Government the benefit of expert knowledge to enable them to find a permanent solution of the railway situation.

In the course of the discussion on the Canadian Northern and Grand Trunk Pacific loans, May 15, the Minister of Finance said: "We are confronted with a railway situation which it is our duty to solve, and which we propose to solve by taking the best expert advice that we can get, looking to a permanent settlement of these difficulties which annually confront the Government. My own view is that the solution of that railway problem may involve, and probably will involve, the Government of Canada taking over one or more of the railway systems of Canada. As I stated in my speech when introducing these loans to the House, it is possible that it may lead to the nationalization of the railways of Canada. But I stated at the same time, and I state now, that whether a war is on or not, it is not a light undertaking to take over all the railways of the Dominion. We should have to consider many things; as, for example, the effect upon our credit of taking them all over at once. The member for South York seemed to suggest that it was a very easy thing to take them all over. Well, it is not an easy thing to take over all the railways of Canada and assume all the activities now being carried on by them, activities connected with immigration; activities connected with transportation upon the Atlantic and upon the Pacific; the operation of all those roads; the financing of their needs. That would not be a light undertaking at any time, even if we had no war. But I desire, in conclusion, to say that we are in this war; we are confronted with heavier responsibilities by far than have ever fallen to the lot of the people of Canada before; that the end of this war is not in sight; that we are increasing our national debt at the rate of \$20,000,000 or \$25,000,000 a month; that we shall probably be confronted with

Small Claims Against Government Railways.

In an Act passed in 1911, setting out the procedure to be followed in respect to small claims against the Canadian Government Railways, under which the General Manager may be sued directly, provision was only made for claims against the Intercolonial Ry. A recent case brought out the fact that although the Prince Edward Island Ry. is a Canadian Government railway, a small claim against it could not be tried in the local courts owing to the fact that it was not specifically mentioned in the Act. An Act has now been passed making the Act of 1911 apply to the P.E.I.R., as well as to the I.C.R. In the House of Commons, amendments were introduced to make this provision retroactive, and to make the provisions of the Act apply in future to all railways operated by the Canadian Government. Both were defeated. The Senate added a clause making the measure retroactive so far as the P.E.I.R. is concerned, but the Commons refused to accept it, and the Senate decided May 16, not to press it. The measure therefore became law in the form it left the Commons.

The American Railway Tool Foremen's Association will hold its annual convention at Chicago, Ill., Aug. 24 to 26. Among the committee reports to be dealt with will be the heat treatment of steel, special tools for steel car repairs, devices for reclaiming material, special tools and devices for the forge shop, emery wheels as applied to locomotive repairs, and jigs and devices for locomotive houses.

The American Railroad Master Tinsmiths, Copper Smiths and Pipefitters Association held its annual convention at Chicago, Ill., May 22 to 24, when a number of papers were read and discussed.

The old Western Hotel premises, Second Ave., Saskatoon, Sask., are being thoroughly rearranged for an office building for the Canadian Northern Ry.

Intercolonial Railway Betterments, Etc.

About three years ago a new locomotive house and power station were built at Port Tupper, N.S., on a foundation of creosote piling, the enclosed space being filled in with miscellaneous debris. During the past winter this mass of material was discovered to be on fire, originating either from hot ashes from the locomotives or from spontaneous combustion. When the enclosed area was partially uncovered it was found that some of the creosote piling had been burned off, and the whole building was in danger of collapse. The situation is now reported to be thoroughly under control, and the building in a safe condition, although some cracks have developed.

The Dominion Parliament has voted \$978,000 on capital account towards the building of a branch line from Sunny Brae to Mulgrave, N.S. It was explained that this line will be 93.18 miles long, with a 0.6 gradient east and west. It is intended to open up the central portion of Guysboro County, and to provide a more economical route for the iron, steel and coal traffic from Sydney and Newfoundland than the present one. The vote in 1915 was \$1,000,000, out of which \$22,000 were expended upon surveys, which are now completed, and the present \$978,000 is a revote. It is the Government's intention to proceed with the construction of the line just as soon as financial conditions warrant.

At a conference between the Halifax city authorities and the Dominion Government officials in charge of the construction of the new railway terminal facilities recently, it was agreed that the bridge across Young Ave. be made 80 ft. wide, instead of 65 ft., as originally planned, at an additional cost of \$10,000.

The acting Minister of Railways stated in the House of Commons, May 3, that it was not the Government's present intention to change the location of the line, or to build a new line between Truro, N.S., and Moncton, N.B., for the purpose of avoiding existing heavy gradients over the Cobequid Mountains. Some surveys had been made, at a cost of over \$37,000, for a new route between the two points named.

The Dominion Parliament has voted \$129,600 to bring the New Brunswick & Prince Edward Island Ry., running from Sackville to Cape Tormentine, up to Intercolonial Ry. standard. It is proposed to replace five of the existing bridge structures with pile trestles, three with wood stringers, and the bridge at Baie Verte with steel spans on concrete piers and abutments at a cost of \$56,500. The 56 lb. steel rails will be replaced with 80 lb. at a cost of \$69,000; additional ballasting will cost \$3,100, and a telegraph line \$1,000.

The acting Minister of Railways stated in the House of Commons recently that the total cost of the Main St. subway at Moncton, N.B., was \$132,673.21. Nothing was paid for right of way; but there were certain claims outstanding for abutment damages. When financial conditions improve, the Department will complete the elimination of level crossings in Moncton in accordance with the arrangements made between the management and the City Council. Plans are being made for the building of a subway under the railway tracks at Central St., Campbellton, N.B.

The Dominion Parliament has voted \$111,000 towards the construction of a spur line to Courtenay Bay, St. John, N.

B., this being a revote. The construction of this spur will permit the abandonment of 0.68 of a mile of the present line, which contains a number of objectionable street crossings in the city. The proposed line will be free of all street crossings, and will give the railway control of the water front at that point. The \$111,000 will cover the cost of the purchase of the right of way, all expenses in connection therewith, and the preparation of plans, but will not provide any money for construction. (May, pg. 183.)

Railway Finance, Meetings, Etc.

Maritime Coal Ry. and Power Co.—The annual meeting was held in Montreal, May 1. The report for the year ended Feb. 29 showed net profits of \$136,192, an increase of \$24,981 over the preceding year. After paying \$97,407 interest on bonds, providing for sinking, depreciation and other funds \$11,701, was added to profit and loss account which now stands at \$65,355. The total assets are valued at \$3,940,154. The accounts of the railway portion of the company's undertaking are not reported separately. The directors for the current year are:—W. Hanson, President; A. E. Dymont, Vice President; Hon. N. Curry, G. R. Holme, A. MacLaurin, W. L. Magden, Hon. W. Mitchell, W. H. Tottle.

New Brunswick and Prince Edward Island Ry.—The acting Minister of Railways stated in the House of Commons recently, that the amount paid on the purchase price of the New Brunswick and Prince Edward Island Ry. was \$180,000. The amount unpaid was \$90,000, on which there had been paid in interest to Aug. 1, 1915, \$10,186.50.

St. John and Quebec Ry.—The acting Minister of Railways stated in the House of Commons recently, that since the Government made a tentative agreement for leasing the St. John Valley Ry. (the New Brunswick section of this projected railway), it had expended \$6,925.52 in operation and maintenance. The receipts from the operation were \$5,245.98.

Temiscouata Ry.—Net earnings for February were \$58. Aggregate earnings for eight months ended Feb. 29, \$24,141.

White Pass and Yukon Route.—Gross earnings for Feb. \$17,664, against \$12,543 for Feb. 1915. Aggregate earnings for two months ended Feb. 29, \$26,884, against \$18,818 for same period 1915.

The Master Boiler Makers' Association held its annual convention at Cleveland, Ohio, May 23 to 26. The subjects dealt with in committee reports, covered cleaning and maintaining superheater tubes, removing and replacing wide fireboxes, basic or acid steel for fireboxes, cleaning boilers with tubes removed, cracking of barrel sheets, bulging of front tube sheets, advantage of cutting off stay ends with oxy-acetylene, rules for arriving at maximum heating surface, fusible plugs in crown sheets, standard thickness of copper ferrules for good and bad water districts, do long tubes vibrate in service, oxy-acetylene and its advantages in boiler repairs, electric welding, prevention of cracking in side sheets.

Canadian Society of Civil Engineers, Edmonton Branch. At the annual meeting recently, the following officers were elected for the current year: L. B. Elliott, Chairman; J. Chalmers, Vice Chairman; C. A. Robb, Secretary-Treasurer; A. T. Fraser, J. L. Cote, D. J. Carter and D. Donaldson forming the executive committee.

Timiskaming and Northern Ontario Railway Report.

The Province of Ontario owns the Timiskaming and Northern Ontario Ry., a steam road, and the Nipissing Central Ry., an electric line, which are operated by the Timiskaming and Northern Ontario Ry. Commission. The commissioners' report for the year ended Oct. 31, 1915, issued recently gives the following information:

Revenue from transportation.....	\$1,485,080.02
Revenue other than transportation....	66,471.75

Total operating revenue	\$1,551,551.77
Maintenance of way and structures	\$325,865.86
Maintenance of equipment	262,654.51
Traffic expenses	18,135.13
Transportation expenses ..	625,911.92
General expenses	95,929.49

Total operating expenses	\$1,328,496.91
--------------------------------	----------------

Net operating revenue	223,054.86
Ore royalties	26,268.74
Rent from joint facilities	13,815.26
Rent from lease of road	16,601.37
Miscellaneous income	2,857.98

Total income	\$ 282,598.21
Deductions from income	72,059.58

Total earnings	\$ 210,538.63
----------------------	---------------

Compared with the year ended Oct. 31, 1914, the total operating revenue shows a decrease of \$119,347.10; the total operating expenses a decrease of \$140,077.32; and the net operating revenue an increase of \$20,230.22. The income from ore royalties in 1913-14 decreased, \$29,605.77, while three new items amounting to \$33,274.61, bring the total income up to \$282,598.21, an increase of \$24,399.12. The deductions from income show an increase of \$29,221.86, and the total earnings a decrease of \$18,439.60. From the profit and loss account \$225,000 was paid to the Treasurer of Ontario, leaving a credit balance of \$415,664.24.

ASSETS.

Cost of road	\$17,913,700.48
Cost of equipment	2,243,124.88
Nipissing Central Ry.	464,677.97
Empire Lumber Co., Latchford ..	7,176.50
Working assets	879,750.04
Deferred debit items	9,770.55

\$21,518,200.42

LIABILITIES.

Provincial loan account	\$20,483,415.77
Working liabilities	619,100.41
Balance profit and loss.....	415,664.24

\$21,518,200.42

TRAFFIC STATISTICS.

Revenue passengers	480,995
Passengers carried one mile	21,446,747
Passengers carried one mile per one mile of road	65.287
Average distance carried (miles)	44.59
Average amount received	\$1.00
Average receipts per passenger per mile..	2.25 cts.
Passenger service train revenue per train mile	\$1.15
Revenue freight carried (tons) ..	675,998
Tons carried one mile	94,939,616
Carried one mile per mile of road	289,018
Average distance of haul of one ton (miles)	140.25
Average revenue per ton	\$1.47
Average amount received per ton per mile of road	\$0.98
Freight revenue per train mile	\$1.15
Freight originating on the line (tons) ..	487,173
Received from Canadian lines (tons) ..	151,762
Received from U. S. lines (tons)	38,003
Total (tons)	676,938
Mileage of revenue passenger trains	417,290
Mileage of revenue mixed trains	66,019
Mileage of revenue freight trains	350,489
Total revenue train mileage	833,798

British Rail Exports. The export of steel rails from Great Britain for February was 3,905 tons against 14,877 tons in Feb. 1915, and 35,484 tons for Feb. 1914. The total export for January and February was 4,617 tons, of which 4,169 tons went to India, 317 to Australia and 131 to South Africa.

Increase in Prices of Railway Materials and Supplies.

E. J. Chamberlin, President Grand Trunk and Grand Trunk Pacific Railways, has had the following statement prepared showing the increase in market prices of a large number of materials and supplies used by railway, as compared with the prices in 1914 before the outbreak of war:—

INCREASES RANGING FROM 5 TO 80 PER CENT.		
	Canada.	U.S.
Acids.....	56	—
Bolts, machine and carriage.....	50	49
Bolts, track.....	17½	10
Batteries and renewals.....	34	34
Brake beams.....	17½	10
Brushes.....	7	21
Castings, malleable.....	26	12
Castings, steel.....	—	28
Cement.....	20	19
Chain.....	13	23
Couplers, car and loco.....	55½	48
Drift steel.....	52	52
Drills, carbon.....	15	15
Drift cotton.....	67	67
Fence wire.....	6½	14
Files.....	74	43
Fusees.....	23½	16
Frogs and switches.....	38	—
Gasoline.....	48	12
Glass.....	5	5
Hose.....	38	74
Iron, common bar.....	21½	14
Joints, rail.....	16	17
Knuckles, car and loco.....	10	15
Leather, belting.....	10	10
Lumber, oak, car, loco.....	15	15
Lumber, yellow pine.....	34	22
Metal babbitt.....	67	57
Nails, wire.....	36	—
Netting, loco, stack.....	38	52
Nuts, square.....	38	70
Nuts, hex.....	50	—
Pipe, black.....	78	—
Pipe, galvd.....	38	42
Pipe, cast iron.....	32	21
Rings, packing and piston.....	54	—
Rivets, boiler.....	57½	50
Roofs, car metal.....	40½	33
Roofs, plastic.....	44	64
Rope, Manila.....	15	10
Stationery.....	—	38
Screws, iron.....	10	—
Scoops, shovels.....	—	55
Spikes, track.....	—	—

Steel bars.....	44	—
Steel firebox plates.....	61½	54
Springs, car and loco.....	31	50
Tie plates.....	67½	60
Tires.....	71	25
Tin.....	47½	40
Tubes, superheater.....	43½	36
Valves.....	61	51
Washers, wrought.....	5	6
Waste, cotton and wool.....	25½	18
Wheels.....	38	31

INCREASES RANGES FROM 80 to 938 PER CENT.

Material.	Canada.	U.S.
Antimony.....	607½	600
Brass, rod.....	187½	180
Brass, sheet.....	221½	214
Castings, brass.....	87	87
Copper rod.....	127½	120
Copper sheet.....	107½	100
Copper ingot.....	87½	80
Drills, high speed.....	277½	270
Ferrules, copper.....	131½	124
Iron, galvd. sheet.....	121½	114
Iron, black sheet.....	87½	80
Lead, pig.....	112½	105
Paint, white lead in oil.....	32	26
Potash, prussiate.....	938	928
Rivets, boiler.....	—	91
Screws, brass wood.....	179	123
Screws, iron.....	87	—
Steel bars, plates, angles, etc.....	—	117
Steel plates, angles, etc.....	124½	—
Steel, tool, high speed.....	450	450
Steel billets.....	—	192
Tubes, boiler.....	96½	89
Tubing, copper.....	127½	120
Vitriol, bluestone.....	220	—
Zincs, battery.....	203	—
Stationery.....	100	80
Blotting papers.....	150	140
Copying pencils.....	80	100
Inks.....	100	100
Paper fasteners.....	100	100

Canadian Lines Leased by New York Central Railroad.

The New York Central Rd. Co.'s report for the year 1915 contains the following paragraph: "By lease dated Sept. 27, 1915, which became effective Jan. 1, 1916, this company leased the railway and property of the St. Lawrence & Adirondack Ry. Co. and assumed its lease of a portion of the Grand Trunk Ry. extending from Valleyfield to Beauharnois and its track-

age rights over the Canadian Pacific Ry. from Adirondack Jct. into the city of Montreal. The lease is for 21 years at an annual rental of a sum equal to the interest payable on bonds of the lessor, which may at any time be outstanding, payable direct to the holders of such bonds. On the same date a lease of the railway and property of the Ottawa & New York Ry. Co. was executed to become effective Jan. 1, 1916, and to continue for 21 years at an annual rental of a sum equal to the interest payable on bonds of the lessor, which may be outstanding, payable direct to the holders of such bonds. The Ottawa & New York Ry. extends from the International Boundary in the St. Lawrence River, near Nyando, to the city of Ottawa, in Ontario, and connects directly with the Ottawa Branch of the New York Central Rd. These two leases were made under the authorization and approval of the Public Service Commission of the State of New York, Second District, and of the Canadian Parliament."

The Central Railway of Canada Fiasco.

There was deposited with the Exchequer Court of Canada, May 3, copy of a scheme of arrangement with the Central Ry. of Canada's creditors as provided for by the Railway Act, Revised Statutes of Canada, Sec. 365. The Central Ry. of Canada, proposed to build a railway from Montreal to Georgian Bay. The original incorporation of a company to build such a line dates back to pre Confederation days, and a big land grant was set apart to aid construction. Lines built under the charter were sold to the C.P.R., but certain interests held that the old charter was still good, and the Dominion Parliament within recent years granted the company extensions of powers. Bonds were placed on the market in England; a general contract was entered into for construction, and a considerable amount of grading was done. Wills & Co., the contractors, according to the company, failed to prosecute the work with sufficient dispatch, and they claimed that the company had failed to provide the funds according to contract. Legal proceedings were instituted on both sides, which did not clear the situation, and with the declaration of the governments interested that the land grant voted half a century or more ago, was no longer available, the company ceased to be a construction factor in the railway situation. The settlement of its affairs was the only course open. J. D. Wells, Montreal, is secretary.

New C.P.R. Station Names.—The junction of the Kettle Valley Ry. with the C.P.R., near Hope, B.C., on the north side of the Fraser River, has been named Petain, after the French general in command at Verdun. The junction point of the Kettle Valley Ry. and the C.P.R. near Otter Summit, where the C.P.R. Spence's Bridge branch ends, has been named Brodie, after H. W. Brodie, General Passenger Agent, C.P.R., Vancouver.

A warrant has been issued for the arrest of S. Busby, cashier, Freight Department, Canadian Northern Ry., Saskatoon, Sask. It is reported that defalcations to the extent of over \$6,000 have been discovered. A letter was received from him confessing that he had been engaging in wheat speculation with disastrous results, and that he was enlisting for overseas service.

The Canadian Pacific Railway's Roll of Honor.

C. H. Buell, Staff Registrar and Secretary, Pension Department, C.P.R., has issued list 9, which is prefixed as follows:—"Several thousand officers and employees of this company enlisted for active military duty with the Canadian Expeditionary Forces, and the majority of them are now in Europe, bravely battling for Canada and the Empire. As particulars of army reservists are not available, these lists of those who have given up their lives for their country or been wounded in action are necessarily incomplete, and do not therefore indicate fully the extent to which the Company's officers and employes have participated in the great struggle."

Alcock, R. W.	Loco. fireman	Red Deer	Wounded
Bearman, F. C.	Wiper	Assiniboia	Wounded
Belisle, Joseph.	Clerk	Outremont	Wounded
Bull, James A.	Rodman	Windy Lake	Killed in action
Coulthard, L. W.	Operator	Montreal	Killed in action
Denholm, John.	Clerk	Winnipeg	Wounded
Doig, David.	Clerk	Winnipeg	Killed
Duff, Louis R.	Brakeman	Moose Jaw	Wounded
Emerson, Sidney.	Craneman	Ogden	Wounded
Field, C. V. G.	Apprentice	Angus	Killed in action
Grignon, Lorenzo.	Car Repairer	Glen Yard	Wounded
Harvey, P. E.	Stower	Toronto	Wounded
Hertzberg, O. P.	Levelman	Toronto	Wounded
Huddle, Charles.	Car Cleaner	Calgary	Wounded
Kirkwood, W. H.	Wiper	Winnipeg	Suffering from shock
Latimer, Walter.	Car Repairer	Toronto	Killed in action
Loucks, Kirk S.	Concrete Inspector	Brooks	Shell contusion
McCauley, N. H.	Clerk	Shaunavon	Killed in action
McLay, Guy R.	Sectionman	Moores Mills	Wounded
McMillan, John.	Tinsmith	Winnipeg	Wounded and prisoner
Othen, Harry.	Porter	Pt. McNicoll	Killed in action
Prescott, Leonard.	Laborer	West Calgary	Wounded
Roland, A. J. H.	Assistant Agent	Carstairs	Wounded
Ryder, F. H.	Yardman	McAdam Jct.	Wounded
Sales, P. C. H.	Wiper	Brandon	Wounded
Smith, Sears D.	Trainman	Brownville Jct.	Wounded
Southgate, C. O.	Clerk	Havelock	Wounded
Whyte, Herbert.	Hostler	Moose Jaw	Wounded

Canadian Railway AND Marine World

ESTABLISHED 1898

Devoted to Steam and Electric Railway,
Marine, Express, Telegraph, and Railway and Canal
Contractors' Interests.

Official Organ of various Canadian Transportation
Associations.

Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A.Can.Soc.C.E.
Managing Director and Editor-in Chief.

AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editors

JOHN KEIR AND DONALD F. KEIR

Canadian Business Representative,
W. H. HEWITT, 70 Bond Street, Toronto

United States Business Representative,
A. FENTON WALKER, 143 Liberty St., New York

European Business Representative,
J. MEREDITH MCKIM, 16 Regent St., London, Eng.

Authorized by the Postmaster General for Canada,
for transmission as second class matter.

Entered as second class matter, July 25, 1913, at the
Postoffice at Buffalo, N.Y., under the Act of Congress
of March 3, 1879.

SUBSCRIPTION PRICE, including postage any-
where, \$2 a year.

SINGLE COPIES, 20 cents each, including postage.

The best and safest way to remit is by express money
order. Where one cannot be obtained, a post office
money order, or bank draft, payable at par in Toronto,
may be sent. Cheques or drafts not payable at par in
Toronto cannot be accepted. Remittances should be
made payable to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by
the 10th of the month preceding the date of publication.

TORONTO, CANADA, JUNE, 1916

PRINCIPAL CONTENTS.

Appointments, Transportation	234
Birthdays of Transportation Men	216
Board of Railway Commissioners—	
Orders by, Summaries of	230
Traffic Orders	237
Canadian Northern Ry., Further Dominion	
Government Aid	224
Niagara Peninsula Interests	221
Electric Railway Department	238 to 244
Answers to Questions on Electric Railway	
Topics	243
Brandon Municipal Ry. Construction Costs	242
Brantford Union Electric Railway Station	240
Finance, Meetings, etc.	241
Lake Erie & Northern Ry. Portable Sub-	
stations	239
Ontario Hydro Electric Legislation	243
Projects, Construction, Etc.	242
Statistics	238
Toronto Ry., Increase of Capital	240
Express Companies, Among the	254
Freight and Passenger Traffic Notes	223
Grain in Store at Terminal Elevators	252
Grand Trunk Ry. Annual Meeting	220
Grand Trunk Pacific Ry., Further Dominion	
Government Aid	224
Hudson Bay Railway	219
Intercolonial Ry. Betterments	231
Mainly About Railway People	228
Marine Department	245 to 254
Canadian Northern Steamships Sold to	
Cunard Co.	247
Canal Statistics for 1915	246
Icebreaker J. D. Hazen Launched	245
Marine Notes	253
Prince Edward Island Steamship Service	248
Steel Shipbuilding and a Mercantile Marine	
Vessels Registered	248
Welland Ship Canal	248
Outside Frictionless Rail for Curves	213
Railway Development	222
Railway Mechanical Methods and Devices	216, 216
Railway Rolling Stock Notes	226
Railway Situation, Royal Commission to	
Enquire Into	230
Railway Statistics	218
Postal Service in Quebec	218
Government	227
Rubber Goods in Railway Service	217
St. John & Quebec Ry. Construction and	
Operation	217
Telephone, Telegraph and Cable Matter	214
Ticket Salesmanship	214
Timiskaming & Northern Ontario Ry. Report	231
Toronto, Hamilton & Buffalo Ry. Wages	223

Canadian Government Railways Officials' Salaries, Etc.

In the House of Commons recently, the acting Minister of Railways gave the names and salaries of 23 officials who have been engaged from other railways between Jan. 1, 1912, and Dec. 31, 1915, as follows:—

Engineering Department—C. B. Brown, \$500 a month; A. T. McDonald, \$110; F. S. Wilkins, \$100; G. C. Lightner, \$165; L. H. Robinson, \$150; A. D. W. Cuthbert, \$90; Jas. Pullar, \$90; H. T. Ruhl, \$200; L. Brousseau, \$140; T. L. Landers, \$125; G. C. Perkins, \$85; A. H. Jones, \$125; J. E. Long, \$225; T. F. King, \$100.

Operating Department—J. K. McNeillie, \$500; A. C. Barker, \$215; W. C. Roberts, \$125; W. S. Byrne, \$50.

Traffic Department—C. A. Hayes, \$833.33; E. Legasse, \$105; T. Cree, \$95; H. Russiere, \$90.

Mechanical Department—G. E. Smart, \$300.

Canadian Railway Club Annual Meeting.

The report for the past year was dealt with at the annual meeting at Montreal, May 16. It was announced that 23 members of the club were in active service, two of whom had been killed. During the year, the President, L. C. Ord, joined the Canadian Expeditionary Force, his place, as President, being taken by R. M. Hannaford, Vice President. The officers elected for the current year are: President, R. M. Hannaford, Assistant Chief Engineer, Montreal Tramways Co.; First Vice President, G. E. Smart, Master Car Builder, Canadian Government Railways, Moncton, N.B.; Second Vice President, Prof. Keay, Professor of Railway Transportation, McGill University; Executive Committee, J. Hendry, Master Car Builder, G.T.R., Montreal; T. C. Hudson, Master Mechanic, Quebec Division, Canadian Northern Ry., Joliette; E. E. Lloyd, Auditor of Stores and Mechanical Accounts, C.P.R., Montreal; C. Manning, secretary to Superintendent of Motive Power, G.T.R., Montreal; C. W. Van Buren, General Master Car Builder, C.P.R., Montreal; W. H. Winterrowd, Assistant to Chief Mechanical Engineer, C.P.R., Montreal; Secretary, Jas. Powell, Chief Draughtsman, Motive Power Department, G.T.R., Montreal; Treasurer, W. H. Stewart, Assistant Superintendent, C.P.R., Montreal, at present serving temporarily with the Imperial Munitions Board at Ottawa.

Grain Inspection at Western Points.

The following figures compiled by the Department of Trade and Commerce, show the number of cars of grain inspected on railways at Winnipeg and other points on the Western Division for April, and for eight months ended Apr. 30, with a comparison of the number of cars inspected for eight months ended Apr. 30, 1915.

	April	Eight months to Apr. 30, 1916	Eight months to Apr. 30, 1915
C.P.R. Calgary	9,754	135,068	82,115
C.N.R.	719	5,604	5,870
C. & N. W. P. R.	188	1,486	1,486
G.T.P.R.	1,299	32,990	13,838
Totals	17,774	250,208	109,032

The C.P.R. Chateau Frontenac Hotel, Quebec, was damaged by fire May 16, the fire being confined to the kitchen portion of the building.

C.P.R. Scholarships at McGill University.

George Bury, Vice President, C.P.R., issued the following circular recently:—
“Two free scholarships, covering 4 years tuition in the Faculty of Applied Science of McGill University, are offered, subject to competitive examination, to apprentices and other employees enrolled on the company's permanent staff, and under 21 years of age, and to minor sons of employees. The examination, which will be the regular entrance matriculation examination provided for in the University's Annual Calendar, will be held at the University, Montreal, and at other centres throughout Canada, in June. The candidates making the highest average and complying with the requirements of admission will be awarded the scholarships and have the option of taking a course in any department of the Faculty of Applied Science. Scholarship will be renewed from year to year, to cover a period not exceeding four years, if, at the close of each session, the holder thereof is entitled, under the rules, to full standing in the next higher year. In case a scholarship holder finds it necessary to interrupt his course for a year or more, notice must be given at the close of the session to the C.P.R. Co. and to the head of the University's Railway Department, in order that the scholarship may be open to other applicants. In order to establish prior claim to the next available scholarship, notice of the student's intended return must be given to the C.P.R. and to the head of the Railway Department not later than Jan. 1, preceding the opening of the session in which such scholarship will be available. Applications for certificates entitling eligible persons to enter the competition should be addressed to C. H. Buell, Staff Registrar and Secretary, Pension Department, Montreal. Copies of the annual calendar containing the conditions of admission and announcement of courses may be obtained upon application to J. A. Nicholson, Registrar, McGill University, Montreal.

Canadian Society of Civil Engineers' Reorganization Committee.

The Canadian Society of Civil Engineers, at its last annual meeting, decided to appoint a committee to study and report upon a policy for increasing the society's prestige and influence, and to consider the organization and bylaws. A letter vote of the members taken in April resulted in the election of the following as the committee:—

District 1—W. J. Francis, Phelps Johnson, R. S. Lea, H. H. Vaughan, W. F. Tye, A. Boyer.

District 2—D. H. McDougall, W. A. Duff, L. H. Wheaton.

District 3—A. E. Doucet, A. Amos, A. R. Decary.

District 4—John Murphy, R. deB. Coriveau, G. B. Dodge.

District 5—H. E. T. Haultain, R. W. Leonard, E. W. Oliver.

District 6—H. B. Hucklestone, W. L. Mackenzie, A. J. McPherson.

District 7—R. F. Hayward, D. C. Lewis, E. A. Cleveland.

Steel Rails Ordered.—The C.P.R. has ordered from the Algoma Steel Corporation 30,000 tons of steel rails, special C.P.R. section, 85 lbs. to the yard, for delivery at Sault Ste. Marie, Ont., from May to Sept., 1917.

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canada Steamship Lines, Ltd. — R. DUGUID, Mechanical Superintendent, having been given leave of absence owing to ill health, Gilbert Johnston, Consulting Engineer, is discharging his duties during his absence.

A. C. SHERIDAN, heretofore Passenger Agent, Buffalo, N.Y., has been appointed District Passenger Agent, there, vice J. V. Foy, General Agent, Passenger Department, whose appointment as Assistant General Passenger Agent, Toronto, was announced in our last issue.

J. M. SHEA, heretofore Travelling Passenger Agent, G.T.R., Boston, Mass., has been appointed New England Passenger Agent, Canada Steamship Lines, Ltd., vice J. F. Dolan, General Agent, Passenger Department, resigned to enter private business. Office, Boston, Mass.

Canadian Northern Ry. — G. ABBOTT, heretofore Car Foreman, Edmonton, Alta., has been appointed Car Foreman, Port Arthur, Ont., vice C. Wheaton, transferred.

C. L. ALLEN has been appointed chief draughtsman, Mechanical Department, Winnipeg, vice H. D. Cameron, whose appointment as Mechanical Engineer, Toronto, was announced in our last issue.

R. CURLEY has been appointed City Passenger Agent, Winnipeg.

A. L. JOHNSON, has been appointed Travelling Passenger Agent, Winnipeg.

C. WHEATON, heretofore Car Foreman, Port Arthur, Ont., has been appointed Assistant Car Foreman, Winnipeg, vice J. Rudd, promoted.

A. I. DANIEL, heretofore City Ticket Agent, Regina, Sask., has been appointed Ticket Agent, Brandon, Man.

E. R. CUNNINGHAM, heretofore Passenger Agent, Prince Albert, Sask., has been appointed City Ticket Agent, Regina, Sask., vice A. I. Daniel transferred.

J. RUDD, heretofore Assistant Car Foreman, Winnipeg, has been appointed Car Foreman, Kamsack, Sask., vice W. Millman, transferred.

N. McLEAN, heretofore Locomotive Foreman, Hanna, Alta., has been appointed Locomotive Foreman, Humboldt, Sask., vice A. T. Hannah, transferred.

E. BOWER has been appointed Travelling Passenger Agent, Saskatoon, Sask.

W. MILLMAN, heretofore Car Foreman, Kamsack, Sask., has been appointed Car Foreman, Saskatoon, Sask., vice J. Grant, transferred.

E. G. WICKERSON, heretofore Passenger Agent, Brandon, Man., has been appointed Passenger Agent, Prince Albert, Sask., vice E. R. Cunningham, transferred.

J. GRANT, heretofore Car Foreman, Saskatoon, Sask., has been appointed Car Foreman, Edmonton, Alta., vice C. Abbott, transferred.

A. T. HANNAH, heretofore Locomotive Foreman, Humboldt, Sask., has been appointed Locomotive Foreman, Hanna, Alta., vice N. McLean, transferred.

S. VINCENT, heretofore Locomotive Foreman, Kamloops Jct., B.C., has been appointed Locomotive Foreman, Toller-ton, Alta., vice M. A. Cardell, transferred.

GREEN & BURDICK have been appointed ticket agents at Victoria, B.C.

Canadian Pacific Ry. — F. G. J. COMEAU, General Freight Agent, Dominion Atlantic Ry., Halifax, N.S., has also been appointed District Freight Agent, C.P.R., in charge of traffic to and from the Dominion Atlantic Ry. and the Halifax & South Western Ry., as well as for Halifax, reporting to the Division Freight Agent, Atlantic Division, St. John, N.B., Office, Halifax, N.S.

L. MULKERN, heretofore District Freight Agent, Toronto, has been appointed Division Freight Agent, Atlantic Division, vice W. B. Bamford, transferred. Office, St. John, N.B.

H. JARVIS has been appointed Agent, Sleeping, Dining and Parlor Cars and News Service, St. John, N.B., vice F. Jeffs.



Allan Purvis,
General Superintendent, Eastern Division, Canadian Pacific Railway.

ALLAN PURVIS, heretofore Superintendent, District 2, Ontario Division, London, has been appointed General Superintendent, Eastern Division, vice A. E. Stevens, transferred. Office, Montreal.

C. E. SARNEY, heretofore Locomotive Foreman, Megantic, Que., has been appointed Locomotive Foreman, Farnham, Que., vice H. Frawley, not now in the company's service.

C. SENAY, heretofore General Agent, Quebec, Que., has been appointed Assistant Superintendent, District 3, Eastern Division, vice J. E. Morazain, resigned to enter National Transcontinental Ry. service. Office, Montreal.

T. COLLINS, heretofore Superintendent, District 4, Ontario Division, Toronto, has been appointed Superintendent, District 2, Ontario Division, vice Allan Purvis, promoted. Office, Toronto.

C. J. KAVANAGH, formerly in railway service in the United States, has been appointed Superintendent, District 4, Ontario Division, vice T. Collins, transferred. Office, Toronto.

W. B. BAMFORD, heretofore Division Freight Agent, Atlantic Division, St.

John, N.B., has been appointed District Freight Agent, Toronto, vice L. Mulkern, transferred.

C. GRIBBIN, heretofore Locomotive Foreman, Toronto, has been appointed District Master Mechanic, District 4, Ontario Division, Toronto. This is a new position.

W. WRIGHT, heretofore Assistant Locomotive Foreman, London, Ont., has been appointed Locomotive Foreman, Toronto, vice C. Gribbin, promoted.

A. EDWARDS, heretofore fitter, has been appointed Assistant Locomotive Foreman, London, Ont., vice W. Wright, promoted.

H. HICKS, heretofore Night General Yardmaster, Winnipeg, has been appointed General Yardmaster, Fort William, Ont., vice G. J. Fox, promoted.

D. CONDELL, heretofore Car Foreman, Nelson, B.C., has been appointed Car Foreman, Ignace, Ont., vice D. McKay, transferred.

G. J. FOX, heretofore General Yardmaster, Fort William, Ont., has been appointed Trainmaster, District 2, Manitoba Division, vice D. England. Office, Winnipeg.

A. E. STEVENS, heretofore General Superintendent, Eastern Division, Montreal, has been appointed General Superintendent, Saskatchewan Division, vice J. G. Taylor, who has retired on account of ill health. Office, Moose Jaw.

W. J. RENIX, heretofore District Master Mechanic, District 1, British Columbia Division, Revelstoke, has been appointed Master Mechanic, Saskatchewan Division, Moose Jaw, and not District Master Mechanic, Moose Jaw, as stated in our last issue.

E. W. DUVAL, who has been acting General Superintendent, Saskatchewan Division, Moose Jaw, for some weeks during the absence through ill health of J. G. Taylor, General Superintendent, has resumed his position as Superintendent, District 3, Saskatchewan Division, Saskatoon.

J. H. SCOTT, who has been acting Superintendent, District 3, Saskatchewan Division, Saskatoon, during the absence of E. W. DuVal at Moose Jaw, has resumed his position at Chief Dispatcher, Saskatoon.

D. MCKAY, heretofore Car Foreman, Ignace, Ont., has been appointed Car Foreman, Field, B.C., vice C. J. Crozier, transferred.

F. W. SADLIER, heretofore Shop Foreman, Revelstoke, B.C., has been appointed Locomotive Foreman, Fort William, Ont., vice G. Twist, and not District Master Mechanic, as stated in our last issue.

H. J. REED, heretofore Locomotive Foreman, Souris, Man., has been appointed Locomotive Foreman, Cranbrook, B.C. The name was wrongly given in our last issue, as J. A. Reid.

C. J. CROZIER, heretofore Car Foreman, Field, B.C., has been appointed Car Foreman, Nelson, B.C., vice D. Condell, transferred.

M. A. CARDELL, heretofore Locomotive Foreman, Toller-ton, Alta., has been appointed Locomotive Foreman, Kamloops Jct., B.C., vice S. Vincent, transferred.

W. H. DEACON, heretofore City Passenger Agent, Spokane, Wash., has been appointed Travelling Passenger Agent, Vancouver, B.C.

H. M. BEYERS, heretofore City Passenger Agent, Tacoma, Wash., has been

appointed City Passenger Agent, Spokane, Wash., vice W. H. Deacon, promoted.

D. C. O'KEEFE, heretofore clerk in Passenger Department, Tacoma, Wash., has been appointed City Passenger Agent there, vice H. M. Beyers, transferred.

Canadian Pacific Ocean Services, Ltd.—E. T. STEBBING has been appointed General Agent, Passenger Department, Trans-Pacific and Trans-Atlantic Lines, New York, dealing with all matters pertaining to passenger traffic for the ocean services, but until further advised, agents continue to report and remit for ticket sales, as at present. Office, 1231, Broadway.

Dominion Atlantic Ry.—D. J. MURPHY, Jr., Superintendent of Transportation, having been granted extended leave of absence on enlistment for active service, R. B. BROWN, heretofore Chief Dispatcher, has been appointed Trainmaster and Chief Dispatcher. Office, Kentville, N.S.

Grand Trunk Ry.—C. R. MOORE, heretofore chief clerk, has been appointed Assistant to Vice President, Construction, Maintenance and Operation (H. G. Kelley). Office, Montreal.

H. A. CLARK, heretofore with Mussels Limited, Montreal, has been appointed storekeeper, G.T.R., Richmond, Que., vice M. E. Martin, enlisted for active service with the 9th Field Ambulance Corps.

W. J. MOFFAULT, heretofore City Passenger and Ticket Agent, has been appointed City Passenger Agent, Toronto.

C. E. TENNEY, heretofore Passenger and Ticket Agent, Portland, Me., has been appointed City Ticket Agent, Toronto.

G. A. HARRISON, heretofore City Passenger and Ticket Agent, Sherbrooke, Que., has been appointed Passenger and Ticket Agent, Portland, Me., vice C. E. Tenney, transferred.

G. L. BRYSON has been appointed Travelling Passenger Agent, Kansas City, Mo., vice C. N. Wilson, resigned.

H. G. SMITH, heretofore Assistant City Passenger and Ticket Agent, Grand Rapids, Mich., has been appointed City Passenger and Ticket Agent, Mount Clemens, Mich., vice Casper Cizek, resigned.

Grand Trunk Pacific Ry.—W. T. HUTCHISON has been appointed Manager, Macdonald Hotel, Edmonton, Alta., vice Louis Low.

Great Northern Ry.—G. H. HESS, Jr., has been appointed Assistant Comptroller, vice F. H. Parker, whose appointment as Assistant General Freight Agent, was mentioned in our last issue. Office, St. Paul, Minn.

Michigan Central Rd.—A press report stating that T. Hickey, Roadmaster, St. Thomas, Ont., had been appointed Superintendent of Tracks at Detroit, Mich., is incorrect. We are officially advised that the company has not had a Superintendent of Tracks for a number of years and that there is no intention of creating such an office at present.

Minneapolis, St. Paul & Sault Ste. Marie Ry.—T. E. SANDS, heretofore General Freight Agent, has been appointed Freight Traffic Manager. Office, Minneapolis, Minn.

National Transcontinental Ry.—J. E. MORAZAIN, heretofore Assistant Superintendent, District 3, Eastern Division, C.P.R., Montreal, has been appointed Superintendent, District 1, N.T.R., vice A. J. Gorrie, resigned. Office, Quebec, Que.

Prince Edward Island Ry.—ALEXANDER SCOTT has been appointed Resident Engineer, Charlottetown, P.E.I.

Construction Battalion for Overseas Service.

The Minister of Militia has authorized the formation of No. 1 Construction Battalion, to be raised by Blair Ripley, M.Can.Soc.C.E., heretofore Engineer of Grade Separation, C.P.R., Toronto, and who has been appointed Lieutenant-Colonel and officer commanding. The class of men being recruited is of a somewhat varied nature, and Lt.-Col. Ripley is aiming to get bridge and building men, railway sectionmen, railway construction men, general construction men and laborers, as well as artisans of various trades, and it is hoped that the battalion will be composed of officers and men who will be able to undertake construction work of almost any nature. The object of the battalion, which will consist of 1,038 officers and men, is somewhat indefinite. It will, of course, operate on lines of communication, and generally speaking its work will be to make good or replace works destroyed by the enemy, and to build works necessary in connection with the effective combating of the enemy. It is likely that the unit will be attached to the Royal Engineers, and it is very probable that a large amount of its work will be roadmaking, etc. The battalion, of course, will do what it is called upon to do, and the men will be chosen with this in view. No one will be taken on who cannot do skilled or unskilled labor of some sort. It is expected that the battalion will be dispatched overseas almost as soon as it is recruited up to strength. The officers chosen up to date are as follows:—

Lieut.-Col. and officer commanding—Blair Ripley, M.Can.Soc.C.E., was born at Oxford, N.S., Aug. 29, 1880, and was from 1901 to 1903, Assistant Engineer, Canadian Northwest Irrigation Co., Great Falls & Canada Co., Alberta Ry. & Coal Co., and St. Marys River Ry. in Alberta and Montana respectively; 1903 to 1905, Chief Engineer of Construction, St. Marys River Ry. in Alberta, and from 1904 to 1905, also Chief Engineer of Construction, Alberta Ry. & Irrigation Co.; 1905 to 1907, Resident Engineer on Construction, Grand Trunk Pacific Ry. in Manitoba and Saskatchewan, and Assistant Engineer on harbor work, G.T.P.R., Prince Rupert, B.C.; 1907 to May 1, 1916, Resident Engineer on grade revision, C.P.R., Maple Creek to Medicine Hat, Alta.; Resident Engineer on field work, Lethbridge viaduct, C.P.R.; Assistant Engineer in charge, Old Man River viaduct, C.P.R., Macleod, Alta.; Assistant Engineer in Charge, Outlook viaduct, C.P.R., Outlook, Sask. On the completion of these works he was sent by the C.P.R. to Nova Scotia to report on betterments and improvements in connection with the Dominion Atlantic Ry., and to organize and prepare for the replacement of some large and difficult bridges on the waters of the Bay of Fundy. In 1912 he was appointed Engineer in Charge of the grade separation, C.P.R., North Toronto, which work is now almost completed.

Capt. and Adjutant—T. R. Loudon, B.A.Sc., A.M.Can.Soc.C.E., was for some time assistant professor of ferro-metalurgy at Toronto University and of late a member of the engineering firm of James, Loudon & Hertzberg. He has been instructing at militia headquarters at Toronto recently.

Capt. J. H. Byrne, S.Can.Soc.C.E., graduate of Royal Military College and McGill University. He was on the National Transcontinental Ry. as District and Government Inspecting Engineer and

has had considerable experience on construction, chiefly of railways.

Capt. R. R. Holland has been actively connected with construction of railways and other engineering works for 15 years, having filled positions as Resident Engineer, Assistant Engineer and Division Engineer on both the Canadian Northern and National Transcontinental Railways.

Capt. A. R. Ketterson, A.M.Can.Soc.C.E., Associate of Glasgow Technical College, until this appointment Assistant Bridge Engineer, C.P.R., Montreal. Has previously represented the Bridge Engineer on Western Lines, C.P.R., and has had varied experience in engineering and construction both in Canada and Scotland.

Paymaster H. G. Henson, graduate of McGill University in architecture. Served in Paymaster General's office, Militia Department, Ottawa, for a year.

Capt. Quartermaster Victor G. Davis, formerly of Canadian Pacific and Canadian Northern Railways purchasing department. He has qualified as a lieutenant.

Lieut. J. B. Heron, of Toronto; experience chiefly in construction. He was in the Boer War, and has for some time been in the Canadian Engineers, both at Niagara and Toronto camps.

Lieut. Fred G. Cross, A.M.Can.Soc.C.E., for nine years with the C.P.R. in Western Canada and in the Natural Resources Department, C.P.R.

Lieut. H. R. McQueen, A.M.Can.Soc.C.E., graduate Royal Military College. Experience in mining, railway and general construction works. Latterly Mining Engineer, O.I.M. Co., Chisholm, Minn.

Lieut. O. P. Hertzberg, connected for several years with Engineering Department, C.P.R., two of which were with Lt.-Col. Ripley on grade separation in Toronto. He was in several engagements in the present war and is now recuperating at home, having been wounded some three months ago. He has two brothers at the front in the Canadian Engineers.

Lieut. H. L. Gilmour, of Ottawa, graduate of McGill University. Is connected with the lumber industry in the Ottawa Valley.

Lieut. Geo. S. Grant, of Ottawa, contractor and construction man, son of late Hugh Grant, contractor, who was connected with the building of the Intercolonial Ry. in Cape Breton.

Lieut. G. O. Fleming, S.Can.Soc.C.E., graduate S.P.S., Toronto. Experience chiefly on construction, Toronto Ry. Co., and with the engineers at the militia headquarters, Toronto.

Lieut. V. A. E. Steele has had experience in general construction in both Canada and the United States, and has been for some time connected with the Dominion Railways and Canals Department.

All Rail Wheat Transportation.—Senator Loughheed informed the Senate, May 8, that since the 6c a bushel rate had been in operation, 675,000 bush. of wheat had been hauled from Armstrong to Quebec on the National Transcontinental Ry. On shipments of wheat originating at Winnipeg, the through rate to Quebec is 12c a bushel.

Iron Substituted for Copper and Brass on German Locomotives.—Owing to the heavy demands of ordnance manufacturers, and the general scarcity of copper in Germany, firebox sheets and staybolts are being made of iron, and seamless or welded iron tubing is being used instead of brass branch and oil pipes.

Fire Protection on Railways.

The Board of Railway Commissioners' Fire Inspection Department issued orders recently, under general order 107, directing the C.P.R., the Canadian Northern Ry., and the Grand Trunk Pacific Ry. to maintain a sufficient force of fire rangers for efficient patrol and fire fighting duty on their lines, between April 1, and Nov. 1, except in so far as they may be relieved from so doing by an order in writing from an authorized officer of the Board. The directions of the order are specific in each case, and the areas within which the patrols are to be maintained are fully set out. The directions to the C.P.R. cover mileages on the Manitoba, Alberta and British Columbia Divisions; to the Canadian Northern Ry., mileages on the Central Division, and to the G. T. Pacific Ry., mileages on the Mountain Division. For the supervision of the work, the Board has appointed inspectors, located as follows: E. J. Zavitz, Toronto; Thos. McNaughton, Prince Albert, Sask.; P. C. B. Hervey, Edmonton, Alta.; E. H. Finlayson, Calgary, Alta.; D. R. Cameron, Kamloops, B.C.; M. A. Grainger, Victoria, B.C.; H. S. Irwin, Prince Rupert, B.C.; R. E. Allen, Hazelton, B.C.; H. G. Marvin, South Fort George, B.C., and P. S. Bonney, Tete Jaune, B.C. The object sought to be obtained is the prevention of fires along railways, and to avoid as far as possible the imposition of unnecessary expenditure upon the companies for that purpose. An efficient system of fire patrol can be established at a minimum expenditure, and as the conditions vary from time to time and from place to place, the fire inspectors appointed by the Board have authority to waive the requirements wholly or in part from time to time as practicable. The order in each case calls for the minimum of adequate protection.

Provision of Cars Under Canada Grain Act.—An act has been passed by the Dominion Parliament adding a new subsection 2, to section 207 of the Canada Grain Act, 1912, chap. 27, as follows: "Whenever after due examination the Board considers it necessary and advisable in order to facilitate the dispatch of grain which is insufficiently housed and liable to become damp or injured." The section provides that the Board constituted under the provisions of the Canada Grain Act, "may in its discretion order cars to be supplied contrary to the provisions of this part," under certain circumstances, and the new subsection gives the Board power to direct cars to certain districts under conditions which appear to prevail at present and which are not otherwise provided for.

Dynamiter Horn.—The U. S. Federal Circuit Court of Appeals sitting at Boston, Mass., recently, finally denied Werner Horn's application for a writ of habeas corpus, holding that his commission as an officer of the German army was no evidence of authority to commit any act as a belligerent within the United States, and that his action in attempting to blow up the C.P.R. bridge near Vanceboro, Me., was a personal act. Horn's trial for the illegal transportation of dynamite was postponed at Boston, May 3, to enable him to appeal in the habeas corpus proceedings to the U. S. Supreme Court.

Old Steel Rails for trench work, roofs of depots, etc., are being supplied in considerable quantities by the C.P.R. to the British Government.

Union Station Proposed for Montreal.

During the discussion of the Railways and Canals Department's estimates in the House of Commons, May 3, the matter of union station for Montreal was raised, Hon. G. P. Graham and C. Marcel, M.P., suggesting that the time was opportune for considering it, seeing that the G.T.R. Bonaventure Station had been burned, and the question of its rebuilding was being taken up. He said that if the G. T.R. built an expensive new station at Bonaventure St., there would be no possibility of a union station being built for many years to come.

The acting Minister of Railways stated that there is no possibility of anything being done in the way of rebuilding the Bonaventure station for months to come. Meanwhile the commission that is about to be appointed to enquire into the whole railway situation of the country will report on just such matters as the provision of union stations at important centers in the Dominion.

The suggestion was made that all passenger traffic should be arranged to run into the C.P.R. Windsor St. station, which could be developed into a union station.

Toronto Civic Ry. Cars Ordered.—The City Council has ordered materials for 13 double truck, double end cars, the parts being assembled in the council's car barns. The contracts have been awarded as follows: Bodies, \$4,907 each, the city supplying the step and door mechanism, Preston Car & Coach Co.; trucks, \$828.50 a set, Dawson & Co.; electrical equipment, \$1,866 a set, Canadian Westinghouse Co.; the city supplying gears and pinions; wire and cable, \$123.17 a car, Eugene F. Phillips Co.; fare boxes, \$51.10 each, Coleman Fare Box Co. A contract has also been awarded to R. Chalkley & Son, Ltd., for an extension to the St. Clair Ave. car barn, for \$24,435.

Damage Suit Against C.P.R.—An important action was begun May 10 before Mr. Justice Clute at Goderich, Ont., in which O. E. Fleming, Windsor, Ont., is the plaintiff and the C.P.R. is the defendant. The action arose out of the building of the Guelph & Goderich Ry., in the construction of which a bridge had to be built over a river running through the Attrill estate, Goderich, which the plaintiff had purchased to develop the gravel beds on it. He claims that as a result of the building of the bridge the current of the river has been so diverted as to wash away thousands of loads of gravel, for which he claims \$30,000 damages. The further hearing of the case was adjourned to Toronto.

The Railway Signal Association held its regular meetings at New York, May 24 and 25, when the general committee reports were dealt with, and also the report of a special committee on the harmonization of specifications for electrical requirements. A preliminary report on standard marking or numbering of relay posts was also considered, on presentation by a special committee on electrical testing.

The employees of the various express companies operating in Winnipeg, have formed a "good cheer club" in the interests of employees who have enlisted for active service. Presentations are made to those enlisting, field comforts are provided for those at the front, pamphlets are issued quoting letters from men on service, and communication is kept up with those now in Europe.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, for Western Lines, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$1,206,100	\$281,000	\$285,100	x\$145,400
Aug.	1,192,800	954,000	238,800	x5,900
Sept.	2,014,500	1,358,000	661,600	1,900
	\$4,413,600	\$3,227,000	\$1,186,600	x\$79,300
Decr.	\$658,300	\$579,000	\$79,300	.....

x Decrease.
Mileage in operation at Sept. 30, 1915, 4,965, against 4,670 at Sept. 30, 1914.

Commencing with October, the figures show the earnings of the entire system, both eastern and western lines.

	Gross Earnings	Expenses	Net Earnings	Increase
Oct.	\$3,678,500	\$2,421,500	\$1,257,000	\$537,800
Nov.	3,535,200	2,323,800	1,211,400	618,400
Dec.	3,435,600	2,233,500	1,202,100	768,900
Jan.	2,086,800	1,831,400	255,400	88,100
Feb.	2,089,200	1,959,800	129,400	x193,500
Mar.	2,607,000	2,240,600	366,400	x134,800
	\$17,432,300	\$13,010,600	\$4,421,700	\$1,706,800
Inc.	\$5,897,800	\$4,191,000	\$1,706,800	.....

x Decrease.
Decrease in net earnings in March compared with last year, was due to snow blockades and other interruptions to traffic which increased operating expenses abnormally.

Approximate earnings for April, \$2,819,300, against \$1,938,900 for April, 1915, and for two weeks ended May 14, \$1,425,700, against \$784,400 for same period 1915.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$7,895,375.47	\$5,094,972.35	\$2,800,403.12	\$978,042.71
Aug.	8,801,451.52	5,359,136.80	3,442,314.72	79,157.02
Sept.	10,273,165.45	5,527,864.81	4,745,300.64	378,252.25
Oct.	13,433,206.88	6,863,780.29	6,569,426.59	3,258,105.79
Nov.	13,351,283.51	6,996,870.48	6,354,413.03	3,710,340.86
Dec.	12,705,673.45	7,003,351.97	5,702,321.48	3,502,797.67
Jan.	8,588,826.04	6,498,417.81	2,090,408.23	954,174.93
Feb.	8,795,830.30	6,501,487.56	2,294,342.74	315,328.12
Mar.	10,380,981.98	6,959,651.62	3,421,330.36	448,315.63

\$94,235,802.16 \$56,805,533.69 \$37,430,268.47 \$11,664,429.57
Inc. \$17,599,981.48 \$5,935,551.92 \$11,664,429.56

Approximate earnings for April, \$10,568,000, against \$7,164,000 for April, 1915, and for three weeks ended May 21, \$7,965,000, against \$4,773,000 for same period in 1915.

Grand Trunk Railway Earnings.

Following are the earnings and expenses for the G.T.R., including the Canada Atlantic Ry., the G.T.W.R. and D.G.H. & M.R., for March, compared with those for Mar., 1915:—

GRAND TRUNK RAILWAY.			
	1916.	1915.	
Earnings	\$3,550,850	\$3,242,450	
Expenses	2,664,600	2,419,800	
Net earnings	\$ 886,250	\$ 822,650	
GRAND TRUNK WESTERN RAILWAY.			
Earnings	\$ 710,400	\$ 582,750	
Expenses	561,100	573,800	
Net earnings	\$ 159,300	\$ 8,950	
DETROIT, GRAND HAVEN & MILWAUKEE RY.			
Earnings	\$ 248,000	\$ 189,000	
Expenses	243,900	213,000	
Net earnings	\$ 5,100	\$ x 24,000	

x Deficit.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1 to Apr. 30,—			
	1916	1915	Increase
G.T.R.	\$13,577,901	\$11,734,513	\$1,843,388
G.T.W.R.	2,914,947	2,274,071	640,876
D.G.H.&M.R.	1,003,012	787,348	215,664
	\$17,495,860	\$14,795,932	\$2,729,928

Approximate earnings for April, \$4,685,505, against \$3,205,778 for Apr., 1915, and for two weeks ended May 14, \$2,107,204, against \$1,755,301 for same period 1915.

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section, 916 miles, for April were \$166,132, against \$210,272 for Apr., 1915. Aggregate earnings for four months ended Apr. 30, \$1,519,201, against \$923,673 for same period 1915.

Traffic Orders by Board of Railway Commissioners.

Charges for Ice and Salt in Refrigerator Cars.

General order 164. April 26.—Re tariffs of railway companies showing charges for ice and salt in refrigerator cars. Upon hearing the application at Ottawa, Mar. 21, the Canadian Pacific and Canadian Northern Railways, the Canadian Manufacturers Association, and the Montreal and Toronto Boards of Trade being represented; tariffs showing the said charges having been filed with the Board as required at the hearing: It is ordered that the following tariffs be suspended, pending further hearing by the Board, viz.: Canadian Pacific, C.R.C. no. E-3138, C.R.C. no. E-3139; Grand Trunk, C.R.C. no. E-3356, C.R.C. no. E-3357; Canadian Northern, C.R.C. no. E-768, C.R.C. no. E-769; Michigan Central, C.R.C. no. 2524; Wabash, C.R.C. no. 936; Pere Marquette, C.R.C. no. 2015; Dominion Atlantic, C.R.C. no. 476; Quebec, Montreal & Southern, C.P.R., no. 568; Essex Terminal, C.R.C. no. 310; London & Port Stanley, C.R.C. no. 77; Toronto, Hamilton & Buffalo, C.R.C. no. 1092; Thousand Island, C.R.C. no. 1092; Hull Electric, C.R.C. no. F-56; Glengarry & Stormont, C.R.C. no. 41; Windsor, Essex & Lake Shore Rapid, C.R.C. no. 177; Algoma Central & Hudson Bay, C.R.C. no. 348, C.R.C. no. 349; Central Vermont, C.R.C. no. 1101; Boston & Maine, C.R.C. no. 1705; New York Central, C.R.C. no. 719, C.R.C. no. 720; Chatham, Wallaceburg & Lake Erie, C.R.C. no. 403.

Lumber and Shingles from Eburne, B.C.

24857. April 4.—Re complaint of Hunting-Merritt Lumber Co., Ltd., of Vancouver, against the refusal of the British Columbia Electric Ry. to handle cars destined to or for furtherance via Great Northern or Northern Pacific Railways; and the rate on lumber and shingles of 1c per 100 lbs. over Vancouver rates which the complainants have to pay on shipments from Eburne to points in Canada and the United States. Upon hearing the complaints at Vancouver, June 1, 1915, the complainants and the Canadian Pacific and British Columbia Electric Railway Companies being represented at the hearing, and upon reading the further submissions filed, and the report of the Chief Traffic Officer of the Board, it is ordered that the complaints be dismissed.

Interswitching Charges at Ottawa.

24861. April 5.—Re complaint of J. R. Booth of Ottawa that the Grand Trunk Ry. charges its local mileage rates on traffic from and to the interchange with the Canadian Northern Ry., authorized to be constructed under order 24416, Nov. 5, 1915, instead of the toll prescribed by order 4988, July 8, 1908, known as the General Interswitching Order. Upon its appearing that the G.T.R. charges other than the toll prescribed by order 4988 for interswitching the Canadian Northern Ry. traffic to and from the transfer track at Ottawa, constructed under order 24416, it is ordered that the G.T.R. forthwith desist from charging for the said service any toll or tolls other than that prescribed under order 4988.

Interswitching Charges at Chatham.

24868. April 5.—Re complaint of T. H. Taylor and the Canada Flour Mills Co. of Chatham, Ont., against the interswitching charge of 2c per 100 lbs. on grain, ex lakes, milled in transit at Chatham. Upon hearing the complaint at Toronto, Feb. 22, the complainants and

the C.P.R. being represented, and upon the report of the Chief Traffic Officer of the Board, it is ordered that the complaint be dismissed.

Rates on Wood and Sulphite Pulp.

24915. April 22.—Re complaint of Price Bros. & Co., Riordan Pulp & Paper Co., Brompton Pulp & Paper Co., J. R. Booth, and the Laurentide Co., against the proposed increase in the rates on wood pulp and sulphite pulp from stations in Canada to points in the United States, it is ordered that the following tariffs be suspended, pending hearing on a date to be fixed by the Board, viz.: Canadian Pacific, C.R.C. no. E-3129; Grand Trunk, C.R.C. no. E-3345; Canadian Northern, Supplement 9 to C.R.C. no. 584.

Allowance for Slatted Floors in Fruit Cars.

24938. April 25.—Re application of Ontario Fruit Growers' Association for an allowance of 1,000 lbs. in weight to cover slatted or false floors used in carloads of fruit. Upon hearing the application at Ottawa, April 18, the complainant and the Grand Trunk and Canadian Pacific Railway Companies being represented, it is ordered that order 19570, June 13, 1913, be amended by adding thereto the following paragraph, viz.: "2. That where shippers furnish slats for the said cars, an allowance of 500 lbs. in weight per car be made."

Rates on Forest Products.

24945. May 5.—Re application of Mountain Lumber Manufacturers' Association of Nelson, B.C., complaining of proposed increase in minimum carload weights of forest products, as set forth on pg. 3 of Supplement 10 to C.P.R. Co's C.R.C., no. W. 2061; Esquimalt & Nanaimo Ry., C.R.C. no. 302, and Kettle Valley Ry., C.R.C. no. 52; it is ordered that the items above mentioned covering minimum carload weights on forest products, be suspended until further order.

Rates on Pig Lead.

24962. May 6.—Re complaint of J. W. Warren against increase by C.P.R. of rate on pig lead from Smelter, B.C., to Eastern points: It is ordered that item 20A on pg. 2 of Supplement 13 to C.P.R. Tariff, C.R.C. no. W.2110, showing rates on pig lead, spelter, and antimony, be suspended pending a hearing by the Board.

Express Shipments of Fruit.

24976. May 15.—Re complaint of Jordan Co-operative Co., Ltd., against alleged unsatisfactory handling of fruit shipments by the Canadian Express Co., at Jordan, Vineland, and other points in the Niagara District: It is ordered that the Canadian Express Co. and the Grand Trunk Ry. arrange as follows: That shipments of fruit ready to go forward be handled by the fruit special, due to leave Jordan at 2.05 p.m.; and that the Canadian Express Co. accept by train 97 from Jordan and Vineland stations, shipments of fruit for Ottawa, daily, except Sunday; and that, when necessary, train 97 be held at Vineland for three minutes to permit of express matter being loaded; the shippers to furnish the necessary help to place the shipments in the express car. That a car be placed at Jordan, daily, except Saturday and Sunday; and that shipments for the following points be accepted and loaded into each car, viz., Port Hope, Cobourg, Trenton, Belleville, Napanee, Kingston, Gananoque, Brockville, Prescott, Morrisburg, Cornwall, Lancaster, and Montreal; the said car to

be picked up by train 97 and transferred to train 20 at Hamilton, and afterwards to train 18 at Toronto, and hauled through to Montreal. That, when necessary, train 18 be held five minutes at Toronto, or until 8.35 p.m., in the event of no. 20 being late, to enable the transfer of the said car to be made. And it is further ordered that the service herein required be furnished from July 1 to Aug. 31 next, inclusive; and in the event of any crop failure or other conditions which will allow the shippers to do with a reduced service, the shippers to notify the express company accordingly.

Rates on Live Stock.

24982. May 17.—Re application on behalf of Prairie Provinces Branch of Canadian Manufacturers' Association for suspension of proposed increase in charges in connection with live stock shipments as covered by certain joint tariffs: It is ordered that the following tariffs, viz.: Canadian Pacific Ry. C.R.C. no. W-2075, Canadian Northern Ry. C.R.C. no. W-861, and Grand Trunk Pacific Ry. C.R.C. no. 100, be suspended pending a hearing by the Board.

Charges for Ice, etc., on Refrigerator Cars.

General order 165. May 16.—Re tariffs in railway companies showing charges for ice and salt in refrigerator cars, and General Order 164, suspending them in eastern Canada and from eastern Canada and from eastern to western Canada: The companies having filed tariffs covering similar service in western Canada and from western to eastern Canada: It is ordered that the following tariffs be suspended, pending a hearing by the Board, viz.: Canadian Pacific, C.R.R. no. W-2149; C.R.C. no. W-2150; Canadian Northern, C.R.C. no. W-927, C.R.C. no. W-930; Grand Trunk Pacific, C.R.C. no. 155, C.R.C. no. 156; Esquimalt & Nanaimo, C.R.C. no. 324; Kettle Valley, C.R.C. no. 80.

The London & North Western Ry. of England discontinued the use of dining cars on its trains, May 1, and has adopted the system of supplying cold luncheon baskets when required. It is not stated whether the discontinuance is merely for wartime purposes, or permanently, but the main reasons which brought about the decision, are the shortage of male labor, and the heavy cost of hauling the heavy restaurant cars. It is anticipated that other railways will follow suit. There are 543 restaurant cars in Great Britain, the first one which was run on a British railway on Oct. 25, 1879, having been built at Detroit, Mich., and operated on the Great Northern Ry. by the Pullman Co.

Halibut Shipments to United States.

A bill was introduced in the U.S. Congress, May 20, requiring all halibut reaching the United States through foreign territories to be shipped in bond. The measure has been asked for by the people of Ketchikan, Alaska, which place has lost considerable trade by halibut fishers having transferred their headquarters from there to Prince Rupert, B.C., since the opening of the Grand Trunk Pacific Ry.

A locomotive crane with generator car trailers is a novel arrangement devised by necessity. Some time ago the Pennsylvania Rd. bought four 30-ton locomotive cranes. Recently it was desired to equip two of them with lifting magnets, but there was no room on the crane car for the necessary electric generator. Consequently a small flat trailer was built and a generator set installed on board. Both of these cranes are now in service.

Electric Railway Department

Electric Railway Statistics for Year Ended June 30, 1915.

The following abbreviations are used in the names of railways:—E, electric; E.R., electric railway; E.S.R., electric street railway; S.R., street railway. The minus mark (—) in the column for net income or deficit, shows that there was a deficit in the operation of the line to the extent of the figures given. The numbers following the names of the railways, refer to the notes following the table on this page.

	First Main Track Mileage	Gross earnings from Operation	Miscellaneous Earnings	Operating Expenses	Taxes Funded Debt, etc.	Net Income or Deficit	Total Car Mileage	Fare Passengers Carried
Berlin and Waterloo S. R.	3.28	\$ 50,426	.....	\$ 35,989	\$ 9,503	\$ 4,933	211,178	975,514
Berlin and Northern Ry.	3.15	8,081	.....	7,728	1,227	—875	35,317	108,197
Berlin, Waterloo, Wellesley and L. Huron Ry.	17.81	185,195	.....	113,606	22,699	48,894	318,438	1,232,724
Brandon Municipal Ry.	8.50	35,969	.....	28,394	19,467	—11,893	269,736	782,011
Brantford and Hamilton Ry.	23.00	183,591	.....	102,482	138,706	—105,597	357,800	532,155
British Columbia E. R.	242.55	2,897,463	1,730,733	2,621,197	947,949	1,059,050	12,208,020	46,330,096
Calgary Municipal Ry.	55.00	611,826	13,660	428,797	112,711	83,979	2,822,699	14,073,278
Canadian Resources Development	1.75	1,125	.....	2,471	.....	—1,346	37,191	8,500
Cape Breton E. R.	30.52	191,736	113,613	129,493	113,885	61,972	678,271	3,636,452
Chatham, Wallaceburg & L. Erie Ry	36.94	126,557	.....	91,529	38,545	—3,581	470,991	375,955
Cornwall E. R.	4.00	29,980	115	24,493	2,024	3,617	212,145	387,911
Edmonton Interurban Ry. (1)	8.19	.....	.....	.....	.....	.....	.....	.....
Edmonton Radial Ry.	52.37	584,577	.....	429,337	331,464	—176,224	1,990,434	11,886,810
Fort William E. R.	19.88	128,820	.....	96,650	81,887	—49,717	614,772	2,723,388
Grand Valley Ry.	29.96	75,917	.....	59,728	5,000	11,188	364,801	981,475
Guelph Radial Ry.	8.50	48,086	143	35,358	1,653	11,216	246,230	1,142,699
Halifax Electric Tramway Co.	12.29	321,705	179,954	213,610	48,230	259,818	1,370,430	7,316,727
Hamilton and Dundas E. R.	7.00	60,900	.....	50,873	6,479	3,548	149,460	731,544
Hamilton, Grimsby & Beamsville ..	22.00	133,062	.....	111,383	14,477	7,201	388,523	723,856
Hamilton Radial Ry.	25.00	165,150	.....	137,083	63,943	—35,876	522,867	1,542,367
Hamilton S. R.	30.06	553,584	.....	372,773	89,922	90,888	2,347,441	14,065,104
Hull Electric Co.	15.37	154,862	28,935	118,875	75,936	—11,014	835,199	2,351,808
International Transit Co.	4.30	61,125	7,419	39,380	15,630	12,533	301,295	1,408,376
Kingston, Portsmouth & Cataraqui	8.00	39,917	1,407	34,012	518	6,794	199,680	970,904
Lethbridge Municipal Ry.	11.00	41,053	720	37,145	32,982	—28,354	304,978	871,253
Levis County Ry.	11.75	88,461	.....	69,551	22,325	—3,414	430,800	1,847,348
London S. R.	25.73	385,511	.....	266,989	28,886	79,635	1,788,850	10,408,978
London & L. Erie Ry. & Transpor- tation Co.	28.00	135,016	86	89,567	46,867	—832	400,461	671,381
Moncton Tramways Elec. & Gas Co.	4.47	16,861	.....	19,071	.....	—2,209	116,668	429,555
Montreal Tramways Co. (2)	124.26	6,525,231	.....	3,713,996	1,332,364	1,478,870	18,144,098	153,576,271
Montreal & Southern Counties Ry.	36.84	214,684	372	209,050	2,638	3,369	604,337	1,951,811
Moose Jaw E. R.	9.00	81,961	.....	101,329	335	—16,702	470,818	1,805,372
Nelson S. R.	2.13	12,472	.....	11,702	2,445	—1,674	66,015	229,645
Niagara Falls Park & River Ry.	11.91	128,119	6,137	82,592	33,496	18,248	277,229	1,277,709
Niagara, St. Catharines & Toronto	60.89	605,664	.....	439,539	8,047	158,076	1,341,477	4,771,004
Niagara, Welland & L. Erie Ry.	1.87	19,255	.....	10,506	3,656	5,093	88,920	412,603
Nippissing Central Ry.	15.37	111,426	.....	82,706	4,878	23,841	293,178	1,423,148
Oshawa Ry.	9.00	71,561	827	53,256	4,237	14,895	79,455	215,224
Ottawa E. R.	24.99	1,069,988	.....	690,634	45,772	303,577	4,970,177	25,321,547
Peterborough Radial Ry.	6.04	49,879	.....	36,357	9,337	4,184	429,093	1,108,568
Port Arthur E. R.	12.43	109,160	1,271	83,314	68,442	—41,325	632,280	2,303,855
Pictou County E. Co. (3)	9.10	.....	.....	.....	.....	.....	.....	.....
Quebec Ry. Light & Power Co. Citadel Division	19.77	483,136	.....	295,802	.....	187,334	2,089,530	11,242,483
Montmorency Division	28.60	200,015	.....	144,514	.....	55,500	426,985	1,649,073
Regina Municipal Ry.	30.85	187,068	.....	194,509	95,482	—102,923	966,866	3,937,742
Sandwich, Windsor & Amherstburg	40.27	291,798	37,202	190,466	39,141	99,392	1,034,702	5,074,297
Sarnia S. R.	8.25	58,999	.....	46,265	4,405	8,329	209,196	1,000,402
Sherbrooke Ry. & Power Co.	9.00	45,068	48,220	37,368	55,896	24	436,988	1,030,257
St. John Ry. (4)	18.00	.....	.....	.....	.....	.....	.....	.....
St. Stephen S. R.	7.00	39,488	.....	30,495	5,742	3,251	183,960	749,855
St. Thomas S. R.	7.00	23,680	.....	31,208	.....	—7,527	295,785	498,858
Suburban Rapid Transit Co.	21.02	88,655	.....	63,389	28,044	—2,779	399,594	1,029,817
Saskatoon Municipal Ry.	12.63	137,656	.....	120,679	33,532	—16,555	703,367	2,804,780
Toronto Ry.	62.29	5,877,224	.....	3,496,117	1,257,510	1,123,596	22,417,103	146,603,051
Toronto Suburban Ry.	18.79	139,470	2,734	73,856	30,390	37,957	422,313	2,463,791
Toronto & York Radial Ry.	72.43	598,644	.....	441,164	141,880	15,599	1,529,640	6,188,530
Winnipeg E. R.	108.42	2,164,505	741,583	1,477,198	549,684	879,204	9,589,702	53,630,490
Windsor, Essex & L. Shore Rapid Ry.	36.17	158,169	.....	103,760	59,915	—4,505	385,289	509,973
Winnipeg, Selkirk & L. Winnipeg Ry.	39.40	122,859	8,592	75,459	26,515	29,440	439,371	676,313
Yarmouth E. R.	3.00	37,407	200	27,024	12,771	—2,186	97,128	268,911
Total	1,617.39	\$26,922,899	\$2,923,974	\$18,131,842	\$6,166,030	\$6,176,060 —627,058	115,091,929	562,302,375
						\$5,549,002		

Notes to Electric Railway Statistics.

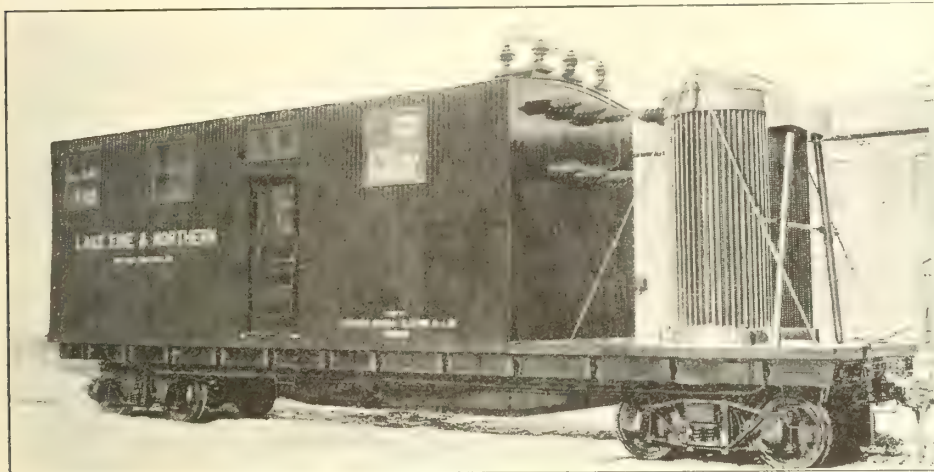
The figures in the foregoing table are compiled from the annual returns to the Railways Department, which however are

incomplete, no returns having been received from the Montreal Tramways Co., the Pictou County Electric Co. and the St. John Ry. in regard to which companies the Department has in some cases

used figures for some preceding years.
(1) The Edmonton Interurban Ry. was not in operation during the year ended June 30, 1915.

(2) The figures given for the Montreal

Tramways Co., for first main track mileage and for total car mileage, in some of the Department's tables, are stated to be for 1911, while in the table of earnings and expenses the figures are evidently taken from the company's annual report for the year ended June 30, 1915, and which were given in Canadian Railway and Marine World for September, 1915, page 355.



Portable Substation, Lake Erie & Northern Railway

(3) No figures are given by the Department for the Pictou County Electric Co. We have shown the first main track mileage as 9.1, the latest figures we have. Figures in regard to operation, etc., are not available.

(4) No figures are given by the Department for the St. John Ry. At Dec. 31, 1915, it had 18 miles of main track which we have included in our table. The gross earnings of its street railway for the year ended Dec. 31, 1915, were \$242,217.31 and the operating expenses \$250,714.34, a deficiency of \$8,497.03. The fare passengers carried were 5,541,417.

The total first main track mileage shown in the Department's report is 1590.29. Adding to this the Pictou County Electric Co., 9.1 miles, and the St. John Ry., 18 miles, as given in our table, makes a total of 1,617.39 miles.

Platforms for Interurban Railways.

At the Ontario Legislature's last session, G. H. Gooderham M.L.A. for South Toronto, introduced a bill to amend the Ontario Railway Act by adding a section as follows:

"106a.—(1) Electric railways operated on the side of a highway shall at all stopping places fixed by the bylaws or regulations of the company, or by order of the Board, construct on the side of the highway between the tracks and the line of the highway platforms for the use of passengers getting on or off any car of the company, and the company shall not allow any person to get on or off a car except from the side on which the platform is constructed.

"(2) Such platforms shall be constructed in accordance with plans and specifications approved of by the Board."

The bill was killed by the Legislature's Municipal Committee, to which it was referred.

Morrisburg & Ottawa Electric Ry.—A special general meeting of shareholders was called to be held at the company's office, Ottawa, on May 30 to forfeit all stock on which any arrears for calls or interest were due.

Portable Substation on Lake Erie and Northern Railway.

The Lake Erie & Northern Ry., which has been in operation for some little time between Galt and Brantford, Ont., and is now completed to Port Dover, has put in operation a portable substation for high voltage direct current generation, two

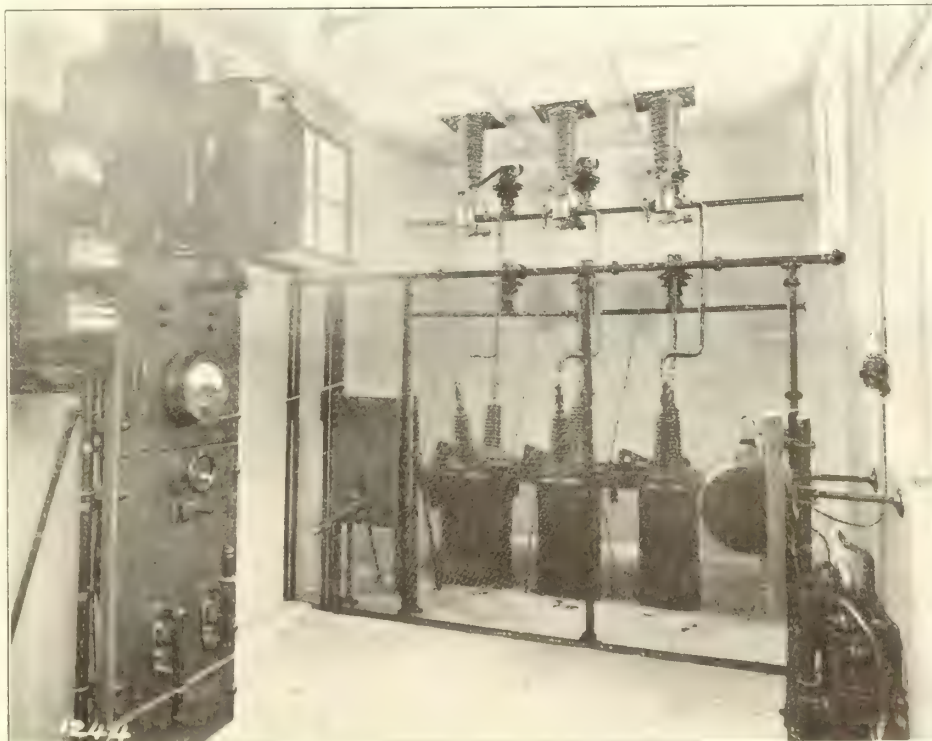
at the left of the photo.

The converter is 500 kw. capacity, 1,500 volts d.c. As it is a commutating pole rotary converter, the brushes are all raised during starting, with the exception of two narrow pilot brushes. There is, on the left of the frame of the rotary converter, a lever for raising and lowering the brushes, and a small semaphore at the top of the frame indicates the position of the brushes, so that the operator can tell at a glance whether the brushes are raised or down. The field break up switch is mounted, for convenience, as the bearing pedestal. The complete rotary converter is mounted on an adjustable base, which permits of ready adjustment for levelling in case the portable substation is standing on a grade.

The portable substation was built by Canadian General Electric Co. at Peterborough, Ont. When it was completed the railway company was not ready to take delivery and it was necessary to leave it standing outside during extremely cold weather. Although no attempt was made to supply excitation to the outdoor transformer during that period, it was found to be in excellent condition when instructions were received for shipment.

illustrations of which are given herewith. The substation is built on a standard steel, 42 ft. flat car, of 60,000 lbs. capacity. The 555 k-v-a, three phase transformer is of the outdoor type, self cooled, and is mounted in the open. The primary

Snow Removal in Montreal.—At the recent Good Roads Congress in Montreal recently, Chief Engineer Mercier of that city read a paper on "Snow Removal in Montreal." He said that the average snow fall for 41 years had been 119 in., and there was snow on 79 days in 1915, with rain on 28 of these days. Mr. Mercier described the methods by which the



Interior of Portable Substation, Lake Erie & Northern Railway

of the transformer is arranged for a supply of 25 cycle energy at 6,600, 13,200 or 26,400 volts. The secondary leads are carried in conduit. The interior view shows the main oil switch and oil switch operating panel, together with the series relays; the high tension a. c. portion of the apparatus being separated from the rest of the cab by a wire screen. The starting switch for the rotary converter is shown to the right of the illustration, and the rotary converter panel is shown

city and the Montreal Tramways co-operated to clear the streets, and referred to the organization under A. Gaboury, Superintendent of the railway, as "wonderful." The cost of cleaning sidewalks was 7½c. a running foot, and clearing the roads cost \$2,500 a mile.

The G.T.R. sued the Sarnia St. Ry., at Sarnia, Ont., May 16, for damages to a train which left the track at a crossing of the street railway. Judgment was reserved.

Union Electric Railway Station for Brantford.

The Lake Erie & Northern Ry., a subsidiary of the C.P.R., and the Brantford & Hamilton Ry., a subsidiary of the Dominion Power & Transmission Co., entered into an agreement recently to build a joint station in Brantford, Ont., and, as already stated in Canadian Railway and Marine World, the contract for its erection was let to Schultz Bros. Co., contingent on satisfactory arrangements being made with the city council and subject to the Board of Railway Commissioners' approval.

The plans as shown in the accompanying illustration provide for a one story building, located over the tracks at the southwest corner of Colburn and Water Streets, with 38 ft. frontage on Colburn St. and 76 ft. on Water St., and tracks to pass beneath the main floor of the

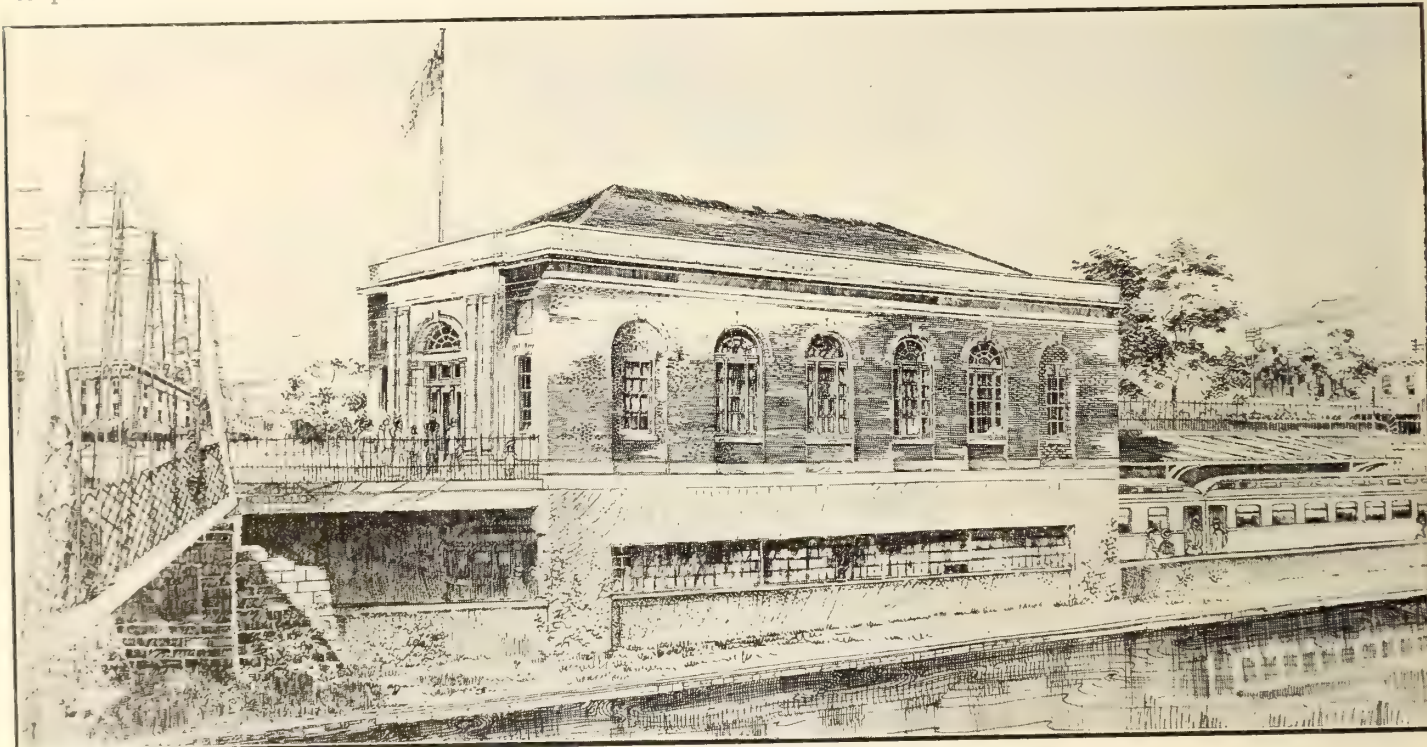
The Brantford City Council approved of the station plans, with a stipulation that the Lake Erie & Northern Ry. buy a strip of land opposite the station site. This the company refused to do, holding that it was not necessary, and the starting of work was deferred in order to bring the matter before the Board of Railway Commissioners.

One-Man Car Operation in Lethbridge.

The Lethbridge Municipal Ry. for the year 1913 showed a net loss on operating of \$4,147.75, and after providing for debenture and other interest and sinking fund there was a total deficit for the year of \$30,831.22. For the year 1914 the loss on operating was \$3,477.14, and after providing for debenture interest, sinking fund, taxes and fire insurance there was a total deficit for the year of \$37,202.33.

Increase of Toronto Railway Co's Capital.

A special general meeting of shareholders was held in Toronto, May 29, to sanction a proposed increase of capital stock by the creation of 30,000 new shares of \$100 each, making the aggregate capital stock \$15,000,000. The circular calling the meeting states that the increase is necessary to provide funds to meet the company's financial requirements and for financing the requirements of subsidiary companies for necessary extensions and betterments of their properties, in accordance with the company's statutory powers and for reasons more particularly indicated in accompanying memorandum. It is the directors' intention to have the new shares available for subscription pro rata by the shareholders, and if not subscribed, the same to be offered to the public.



Station for Lake Erie and Northern and Brantford & Hamilton Railways at Brantford, Ont.

building, with platforms, express and baggage accommodation at the lower level. The design is New England, Colonial style; red brick, with limestone trimmings and green slate roof. The main floor, at street level, with entrance from Colbourn Street, is to contain a main waiting room 35 x 50 ft., women's retiring room and lavatory, men's lavatory and ticket and telegraph offices. Two stairways will lead from the main floor to the track platforms. Baggage and express rooms and steam heating equipment will be located in a separate extension 14 x 76 ft. on the lower or track level. This extension will abut the retaining wall of Water St. and will be accessible for teams at the lower end of the street. The interior of the building will be finished in Canada ash; the walls and ceilings of main waiting room to be plastered and finished with plastered cornice. The floors will be concrete. The lavatories will have a marble wainscot 6 3/4 ft. high. Seats will extend the full length of the two outside walls in the waiting room, except in space occupied by the ticket and telegraph offices. The approximate cost is stated as \$25,000.

For the year 1915 there was a surplus from operating of \$3,677.64, and after providing for debenture interest, sinking fund, taxes and insurance, which totalled \$33,383.37, there was a net deficit of \$29,705.73 for the year.

Commissioner Freeman informs us that the change in operating results from a deficit to a surplus was undoubtedly owing to the one-man car operation which was started June 1, 1914. Financial conditions generally were worse in 1915 than in the previous year and had not the one-man car operation been started, the service would probably have had to be discontinued.

Peterborough Radial Ry. — As announced in Canadian Railway and Marine World for April, the Ontario Government bought the Electric Power Co., Ltd., properties in Eastern Ontario, including the Peterborough Radial Ry. By an order in council passed May 5, the control, administration and management of the properties has been vested in the Hydro Electric Power Commission of Ontario, which is to carry on the undertakings as a separate branch of its business.

The accompanying memorandum above referred to states that the Toronto Ry. Co. has express power by statute to acquire the shares and securities of the following companies and to lend its credit to them or guarantee their bonds or other securities or obligations, viz., Toronto & Mimico Ry. Co. (now Toronto Power Co., Ltd.), Toronto & Scarboro Electric Ry., Light & Power Co., Metropolitan Ry. Co., Schomberg & Aurora Ry. Co., Toronto & York Radial Ry. Co.

In reference to the various bonds issued the memorandum states that among other purposes part of their proceeds were used to purchase the Toronto & York Radial Ry.'s share capital, to build extensions and make betterments to its various divisions; also to purchase the Schomberg & Aurora Ry. Co.'s share capital and to build and equip the line.

The memorandum adds: "In addition to accomplishing the main object—i.e., assuring an adequate supply of power for the Toronto Ry.—steady progress has been made in the sale of power. In 1915 the gross sales of power were \$1,463,639, and in 1914 these are expected to reach a total of \$1,800,000. The gross revenue

from power sales in 1909—the first year of operation, and previous to the expenditures set forth were \$651,830.

"In acquiring the several properties now forming the Toronto & York Radial Ry. Co. and the Schomberg & Aurora Ry., the chief object of the directors was to foster the growth of suburban traffic, to feed the Toronto Ry. Co.'s city system. The resultant advantage to the shareholders of the Toronto Ry. Co. is that should the City of Toronto elect to purchase the Toronto Ry. system they will have left in 1921 a continuing enterprise, including a suburban electric railway system and an extensive and profitable plant for the production and distribution of electricity for light and power purposes."

Regulation of Vehicle Traffic for Protection of Electric Car Traffic.

Two important amendments to statutes were passed at the Ontario Legislature's last session, at the instigation of G. H. Gooderham, M.L.A. for South Toronto. The Motor Vehicles Act, Revised Statutes 1914, chap. 207, provided as follows:

"15. When a motor vehicle meets or overtakes a street car which is stationary for the purpose of taking on or discharging passengers, the motor vehicle shall not pass the car on the side on which passengers are getting on or off until such passengers have got on or off safely to the side of the street as the case may be."

In 1914 two persons were charged at Ingersoll, Ont., with driving an automobile past a Woodstock, Thames Valley & Ingersoll Electric Ry. car at Beachville. The magistrate dismissed the case, holding that the requirement that automobiles do not pass standing electric cars only applied to street railways in a city or town or within a mile and a half of urban limits, and not to interurban lines. The Canadian Electric Railway Association has ever since that decision urged that the act be amended, and at the Ontario Legislature's last session, Mr. Gooderham introduced a bill to carry the suggestion into effect. Its principle was approved of and with a slight amendment it was incorporated in a general bill to amend the Motor Vehicles Act, introduced by the Minister of Public Works, the section being passed as follows:

"8. Section 15 of The Motor Vehicles Act is amended by adding after the words 'street car' in the first line the words 'or a car of an electric railway which is operated in or near the centre of the travelled portion of the highway,' and by inserting after the word 'car' in the third line the words 'or approach nearer than 6 feet measured back or forward from the rear or front end, as the case may be, of the car.'"

Section 15 of the Act as amended therefore now reads as follows:

"When a motor vehicle meets or overtakes a street car, or a car of an electric railway which is operated in or near the centre of the traveller portion of the highway, which is stationary for the purpose of taking on or discharging passengers, the motor vehicle shall not pass the car or approach nearer than six feet, measured back or forward from the rear or front end as the case may be, of the car, on the side on which passengers are getting on or off, until such passengers have got on or got safely to the side of the street as the case may be."

The Highway Travel Act was amended by adding the following section:

"9a. Where a person travelling or being upon a highway in charge of a vehicle,

other than a motor vehicle, or on a bicycle or tricycle, or on horseback or leading a horse, meets or overtakes a street car or a car of an electric railway, operated in or near the centre of the travelled portion of the highway which is stationary for the purpose of taking on or discharging passengers, he shall not pass the car or approach nearer than 6 feet measured back or forward from the rear or front end, as the case may be, of the car on the side on which passengers are getting on or off until such passengers have got on or got safely to the side of the street, as the case may be."

Attempted Confiscation of Sandwich, Windsor and Amherstburg Ry. Rights.

Among several most unjustifiable bills introduced at the Ontario Legislature's last session was one promoted by the city of Windsor. The Sandwich, Windsor & Amherstburg Ry. Co. has a perpetual franchise to supply electric energy in the city for light, power and motive purposes. The city has installed a distribution system and takes power from the Hydro Electric Power Commission of Ontario. The bill referred to provided that the company's rights in regard to supplying power should cease on Dec. 31, 1922, on which date its franchise for the operation of a street railway in the city will expire. No provision was made in the bill for any compensation, and the company's rights were to be absolutely confiscated. When the bill came before the Private Bills Committee, Sir Adam Beck, Chairman of the Hydro Electric Power Commission of Ontario, appeared in support of it, but it was unanimously thrown out, the committee considering that to pass it would be a gross violation of undoubted vested rights.

Then the city had another bill presented, providing that it should have the power to expropriate the Sandwich, Windsor & Amherstburg Ry. Co.'s electric light and power business, and that in default of agreement as to price, it be determined by the Hydro Electric Power Commission of Ontario. No provision was made for arbitration, the Commission being named as the sole judge as to the price. This arbitrary and utterly unjustifiable proposal was also rejected by the committee and the second bill was also unanimously thrown out.

The Legislature is to be congratulated on its action in preserving the inviolability of a contract and for preventing the passage of legislation which would absolutely destroy the rights of investors.

Jitney Traffic Notes.

Winnipeg city authorities are having trouble with some jitney men who put a sign "Anywhere" on their cars, and then charge any fare they please instead of 5c, which is the standard jitney charge.

An auto service was started May 2, by V. N. Lawrence, between Moncton and Hillsboro, N.B., on Tuesdays, Thursdays and Saturdays, leaving Moncton at 8 a.m., and Hillsboro at 10.30 a.m.

The jitney service in Toronto shows signs of increasing, now that the weather is brightening, and riding in open cars is not prejudicial to health. The jitney cars now all carry a label in front marked "Jitney No. —."

The Winnipeg City Board of Trade, on May 10, extended the area within which jitneys may not stop to pick up passengers by including both sides of Notre

Dame, from Portage Ave. to Albert St.

About 60 jitney cars were reported to be operating in Hamilton, Ont., Mar. 20, half of them running on King and Barton Streets. The Hamilton Jitney Association has assigned for the benefit of its creditors, and the jitney men are operating individually.

The Vancouver Jitney Protective Association has been formed in Vancouver, B.C., to look after jitney men's interests. The association is preparing a statement for submission to the city council, and proposes to act in conjunction with the Victoria Jitney men's Association in all matters where joint action can be taken.

The British Columbia Electric Ry. has complained to the authorities that jitney men are not obeying the regulations requiring them to come to a stop 10 ft. behind a street car. The complaint was made as a result of an accident to an employee of the company, who was knocked down by a jitney as he was stepping off a street car, and sustained a fractured skull.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry., and allied companies:—

	Mar. 1916	Mar. 1915	July 1, 1915 to Mar. 31, 1916	July 1, 1914 to Mar. 31, 1915
Gross....	\$485,117	\$557,135	\$4,982,147	\$5,755,041
Expenses	486,819	484,565	4,325,461	4,755,490
Net.....	91,298	72,570	656,686	1,229,551

Cape Breton Electric Co.—

	Feb. 1916	Feb. 1915	Jan. 1 to Feb. 29, 1916	Jan. 1 to Feb. 28, 1915
Gross....	\$28,638.44	\$23,439.01	\$62,458.80	\$52,493.07
Expenses	18,579.05	15,059.10	37,768.61	32,841.48
Net.....	10,059.39	8,379.91	24,690.19	19,651.59

Detroit United Ry. directors have declared a dividend of 1 1/4 % for the current quarter, payable June 1, to shareholders of record May 16. This is at the rate of 7 % a year, and is the largest dividend ever paid by the company, which also owns the Sandwich, Windsor and Amherstburg Ry. in Canada.

Grand Valley Ry.—In connection with the winding up of the affairs of this company, which included the Brantford Street Ry., the G.R.Ry. from Brantford to Galt, and the Woodstock, Thames Valley & Ingersoll Ry., an order was made by Justice Latchford, May 4, for the payment into court by the Receiver, of \$64,176. An application for the discharge of the Trusts and Guarantee Co., as trustee, and of E. R. Stockdale, as receiver, was not granted.

Toronto Civic Ry.—In the estimates prepared for the city council's consideration, the four isolated civic cars lines show an expected deficit for the year of slightly over \$250,000. The general maintenance account is placed at \$296,952, debt charges \$149,636; and claims for damages \$5,000. The estimated revenue is \$200,000.

Toronto Ry.—

	1916	City percentage	1915	City percentage
Jan.	\$173,754	\$68,847	\$171,236	\$69,486
Feb.	470,764	70,614	440,313	66,047
Mar.	518,556	97,237	488,368	93,141
Apr.	496,172	99,234	467,701	93,540
	\$1,959,275	\$335,932	\$1,867,708	\$323,214

Toronto Ry., Toronto & York Radial Ry., and allied companies:—

	Mar. 1916	Mar. 1915	July 1, 1915 to Mar. 31, 1916	July 1, 1914 to Mar. 31, 1915
Gross....	\$910,969	\$820,750	\$2,663,575	\$2,431,427
Expenses	477,031	456,755	1,408,863	1,309,088
Net.....	433,938	363,995	1,254,712	1,122,339

Winnipeg Electric Ry.:—

	Mar. 1916	Mar. 1915	Jan. 1 to Mar. 31, 1916	Jan. 1 to Mar. 31, 1915
Gross....	\$296,000	\$200,000	\$88,714	\$88,714
Expenses...	114,600	197,050	558,685	605,820
Net.....	111,900	106,159	328,525	362,729

Electric Railway Projects, Construction, Betterments Etc.

British Columbia Electric Ry.—A press report states that spur line is being built on the company's Fraser Valley line, between Mount Lehman and Gifford, to Cook's Mill, for logging purposes. The hauling will be done from the landing stage at Mount Lehman, over the main line and spur, at night. (April, pg. 156.)

The British Columbia Electric Ry. is completing the construction and equipment of an electrical receiving station near Horne-Payne station, on its Burnaby Lake line, the construction of which was temporarily discontinued about two years ago. (April, pg. 156.)

Buffalo, Fort Erie Ferry & Rd. Co.—The Ontario Legislature has passed an act incorporating this company. (April, pg. 156.)

Charlottetown Street Car Co.—The Prince Edward Island Legislature was asked recently to incorporate a company with this title to establish a line of street cars to be operated by gasoline and electric power or either and to be motor busses or passenger vans, with a carrying capacity of 15 passengers or upwards and to be operated in the streets of Charlottetown and Common, including Victoria Park Roadway, the roads of the Royalty of Charlottetown and such other roads in the province as might be from time to time available by law. Vehicles to be run every day in the week. It was also stated that the city of Charlottetown be empowered to exempt the company from civic taxation for 20 years and that the exclusive right to operate such vehicles or those of a like nature, be granted in the City and Royalty for 25 years. The provisional directors named were:—D. J. Riley, A. A. Alley, J. McKenna, B. Rogers and C. MacLure. After some discussion the bill was dropped May 3.

The Calgary Municipal Ry.'s temporary line of 2½ miles of single track to the Sarcee military camp is being completed rapidly and was expected to be opened on May 15. The Calgary Corporation had on hand 150 tons of rails and bought 100 tons 60 lb. 60 ft. rails which had been obtained from the receivers of the South East Calgary Corporation. (May, pg. 200.)

Lake Erie & Northern Ry.—A contract is reported to have been let to Schultz Brothers & Co., Ltd., Brantford, for the erection of a brick station on Colburn St., 36 x 76 ft., to be used jointly by the L. E. & N. R., and the Brantford & Hamilton Ry.

The electric installation on the section of the line from Brantford to Port Dover was expected to be completed as far as Simcoe by May 30, and the line to be ready for opening for traffic some time in June. (April, pg. 156.)

Montreal & Southern Counties Ry.—The extension from St. Cesaire to Granby, Que., was opened for traffic April 29. This gives the company a line of 46.63 miles, in addition to about 9 miles in St. Lambert, Montreal South and Longueuil. The first line built by the company extended from McGill St., Montreal, to St. Lambert, and was opened for traffic Nov. 1, 1909. Subsequently the Central Vermont Ry. Chambly Branch, was taken over and electrified, and the present extension from St. Cesaire to Granby has been built on an independent right of way. The principal points on the line

outside the Montreal South area are:—Chambly Basin, mileage 15.91 from McGill St.; Chambly Canton, mileage 17.27; Richelieu, mileage 18.14; Marieville, mileage 22.48; Rougemont, mileage 27.56; St. Cesaire, mileage 31.27; Abbottsford, 38.03; Granby, mileage 46.63. Sub power stations have been erected at St. Lambert, Chambly, Rougemont and Granby. It is proposed later on to extend the line to Sherbrooke, and to other points in the Eastern Townships. (April, pg. 156.)

Montreal Tramways Co.—The Board of Control has asked the company to extend its service from Park Ave. to the C.P.R. station at Mile End, over the tracks already laid but not utilized. (Feb., page 73.)

Nelson St. Ry.—Early in the year the Nelson, B.C., City Council instructed H. P. Thomas, City Electrical Engineer, who acts in a supervisory capacity in connection with the Street Railway Department, to prepare plans and estimate for extending the city car lines along Baker St. from Josephine to Cedar St., and on Vernon St. from Cedar to Josephine St., a total distance of about half a mile. We are officially advised that it has been decided not to go on with the proposed extension at present.

Niagara Falls Park & River Ry.—The work being done to ensure safety, which was undertaken in consequence of the serious accident at Queenston Heights, Ont., July 7, 1915, is reported to be largely completed. A. B. Ingram, Vice Chairman, Ontario Railway and Municipal Board, made a trip of inspection over the line, May 11, and is reported to have stated that the work so far was satisfactory, and that it would be fully completed before the summer traffic commenced. The Board will issue an order thoroughly covering the whole matter.

The Mount McKay & Kakabeka Falls Ry. has been granted permission by the Ontario Legislature to use steam as an alternative motive power to electricity on its railway, and has been given an extension of time to build the uncompleted portion. (April, p. 156.)

Ottawa Electric Ry.—We are officially advised that the laying of a new asphalt pavement on Rideau St., between Sussex and Waller streets, has been commenced by the city council. As a part of this work the company is relaying the section with T rails, 108 and 115 lbs. (May, pg. 200.)

Toronto Civic Ry.—The Toronto City Council has accepted the United States Steel Products Co.'s tender to supply a 3-track car barn special track work layout for St. Clair Ave. civic car barn extension at \$2,120. The City Council has also accepted J. J. Gartshore's tender for purchase of old rails and switches as follows: about 200 long tons of 30 lb. rail at \$21 a ton; 20 no. 5 30 lb. switches at \$6 each; 4 long tons of fish plates at \$28 a ton.

Toronto Civic Ry.—The Toronto City Council has given a contract to the General Railway Signal Co. of Canada, to install a signal system in connection with the operation of the Toronto Civic Ry's Lansdowne Ave. branch, at its crossings with the Toronto Suburban Ry's Davenport Road branch at Lansdowne Ave., for \$2,400.

We are officially advised that a new double track, 0.615 of a mile, is being

laid on Lansdowne Ave extension from St. Clair Ave to the C.P.R. tracks.

Winnipeg Electric Ry.—The West Kildonan, Man., Municipal Council was informed May 12, that the company would proceed immediately to lay a second track on its line from the city limits to Kildonan Park. (April, pg. 156.)

Brandon Municipal Railway Construction Costs.

The following figures show the cost of constructing 1.27 miles of track in 1915, using 60 lb. rail with gravel ballast, the work being done under the supervision of T. Boden, Superintendent:—

113.57 gross tons 60 A.S.C.E. rails....	\$ 5,337.80
Tamarac ties	1,938.00
Angle bars	172.20
10 in. rail bonds.....	176.00
62 in. rail bonds.....	16.00
Spikes.....	165.00
Bolts.....	28.00
Special work	2,995.00
Miscellaneous	25.00

Total cost of track material.....	\$10,853.00
Ballast, excavation, tracklaying, tamping and surfacing.....	3,034.00
Supervision	200.00

Total cost of track construction.....	\$14,087.00
Total cost of track material per mile, not including special work.....	\$ 6,680.00
Labor and construction.....	2,370.00

Total cost of track construction per mile	\$ 9,050.00
---	-------------

The following figures show the cost of overhead construction, including special work, for 1.34 miles:—

Material	\$ 1,343.00
Labor pay	497.00
Supervision	32.00

Total cost of overhead construction..	\$ 1,872.00
Total cost of track and overhead construction	\$15,959.00
Cost of electric line material per mile, not including special work and feeder	\$ 900.00
Labor and supervision.....	370.00

Total per mile.....	\$ 1,270.00
Cost of labor and supervision for electric line and track per mile.....	\$ 2,740.00
Total cost of electric line and track construction per mile, not including special work	10,320.00

At the end of 1913 the Brandon Municipal Ry. had 3.12 miles of track in concrete and 5.92 miles in gravel ballast, a total of 9.04 miles, the cost of labor and supervision to construct which was \$54,460. This does not include the cost of putting in concrete, which was done by contract. On the basis of cost of construction 1914 and 1915, which is the same as previous construction, the cost would have been as follows:—

LABOR AND SUPERVISION TO CONSTRUCT ELECTRIC LINE AND TRACK.

Concrete foundation, 3.12 miles.....	\$ 5,000.00
Gravel ballast, 5.92 miles.....	16,220.00
	\$21,220.00
Contingencies and extra labor on specials	5,000.00
	\$26,220.00

These figures are significant and show apparently that a large amount of money was wasted in the original construction.

W. H. Dinsmore, whose appointment as Traffic Superintendent, British Columbia Electric Ry., Vancouver, was mentioned in our last issue, entered the company's service Feb. 1, 1901, as a conductor; on Nov. 1, 1909, was appointed inspector, and on Nov. 1, 1915, Chief Inspector.

The Toronto Board of Control received tenders to May 23, for the supply of one single truck, double end city car, completely equipped; one car body, double end, single truck; equipment for two single truck cars, all for the Toronto Civic Ry.'s Bloor St. Division.

Answers to Questions on Electric Railway Topics.

The following replies have been received to questions asked, regarding electric railway operation, etc., through the American Electric Railway Association's question box.

Grinding Joints.—What is a fair estimate of the cost of grinding joints, on new track and on old track? Give investment in grinding machinery, number of grinders used, men employed per grinder, whether work is done at night or during daytime, and if at night, whether an increase of wages is paid.

W. F. Graves, Chief Engineer, Montreal Tramways Co.—Have not kept the costs of grinding joints on old and new track separate. However have arrived at an average figure of \$1.18 per joint on a total of 2,622 joints. This includes overhead, machinery repairs, depreciations, renewals, interest, insurance and taxes. Investment in grinding machinery, \$4,500; grinders used, two; men per grinder, three; practically all night work except on construction work where track is dead. Two cents an hour extra is paid to ordinary laborers and 5c. an hour to the men in charge of machines.

Repairing Cup Joints.—How are cup joints repaired and what is the approximate cost?

W. F. Graves, Chief Engineer, Montreal Tramways Co. for the past two years we have been making a practice of repairing cupped joints by pouring mild steel which has been melted with a machine similar to the welder put out by the Indianapolis Frog and Switch Co., with considerable success. In fitting 674 joints in this manner during the past three months we used 510 lbs. of this mild steel or approximately 0.76 lb. per joint.

Traffic Counts.—What are the methods used in making traffic counts, what direct and tangible results are secured from such counts, and what determines the frequency with which they are made?

F. L. Hubbard, Assistant to General Manager, Toronto Ry. Co.—We maintain a staff of traffic counters attached to the transportation department, and independent of divisional inspection forces. Our regular counting is done by routes, the men being stationed at the point of maximum traffic and a count taken of passengers in each car passing that point in both directions. The count is forwarded to transportation department and graphically charted. Special counts are made of transfer passengers at intersections and to secure statistics relating to the trend of traffic, running time of cars, cars laying in at the end of the line, etc. The counts enable the management and officials of transportation department to keep in touch with actual traffic conditions, independent of the reports of traffic inspectors. We use the information in a follow up system of the outside supervising forces by daily sending typewritten extracts of special features from such counts to divisional superintendents. Counts are invaluable to transportation department in checking up requisitions for new time tables sent in by divisional superintendents. The charts form a handy record of traffic and service in dealing with complaints from individuals or before traffic commissions. We keep the staff regularly employed on a circuit of the different lines. The special counts are made as required.

Elimination of Time Points.—Have any companies experience with elimination

of time points and what has been the results?

F. L. Hubbard, Assistant to General Manager, Toronto Ry., No, but we have our doubts of the system proving a success. Even if scheduled time points were abolished, it would seem to us that the individual motor man would divide the route into time sections to guide him in arriving at the terminal on time, and if this assumption be correct, it is better to have this division of time uniform and scheduled for all the men rather than that it should be left to the individual. The lack of time points would prove a handicap to inspectors in checking the running time of cars, and in straightening the line after a block.

In accident prevention work, in schools and among the public generally, have better results been obtained by a organization controlled by the railway itself, or by contributing to and working with safety organization outside of the company?

F. L. Hubbard, Assistant to General Manager, Toronto Ry. Co.—We have obtained better results by contributing to and working with an independent public safety league, composed of representatives from the Ontario Railway and Municipal Board, Government Factory Inspection Bureau, City Council, Police Department, Board of Education, Manufacturers' Association, Trades and Labor Council, Motor League and railway companies. The League being a representative public body has a much broader field to work in than it is possible for the company to cover. Its educational work is not confined to street railway accidents, but covers accidents of all kinds and this is carried on with an entire absence of prejudice or anti corporation feeling on the part of the public.

Equipment Maintenance Cost.—What should be the cost of equipment maintenance: 25% city service, average rate of speed 9 miles an hour, and 75% inter-urban service, average rate of speed 22 miles an hour?

G. Gordon Gale, General Manager, Hull Electric Co., Hull, Que.—The cost of equipment maintenance as specified should be 2½c a car mile.

Repairs after Collisions.—In case of collision and wagon accidents, is it, as a general proposition, more expensive to repair a steel car than a wooden one?

M. Power, Master Car Builder, Toronto Ry., Toronto.—The steel car is the more expensive to repair.

Inspection of Freight Trailers.—What is considered the most efficient way of inspecting freight trailer cars on a property operating 30 trail cars, and where they are not available for daily inspection, being distributed over a line of 150 miles?

M. Power, Master Car Builder, Toronto Ry., Toronto.—This is a question hard to answer without a knowledge of the conditions. It may be quite possible that a system of inspection could be arranged at different points of such a system.

Good Intentions.—A contemporary states, "The Montreal & Southern Counties Ry. has been intended as far as Granby, Que." We have heard that the road to a certain place is laid with intentions, but, as far as memory serves, that place is not Granby.

The Canadian Northern Ex. Co. has placed its service in effect between Inwood and Hodgson, Man., 50 miles.

Hydro Electric Power Commission of Ontario Legislation.

The Ontario Legislature at its recent session passed three acts affecting the water powers of the Province and the Hydro Electric Power Commission of Ontario's powers in respect thereto. The first is an act to regulate the use of provincial waters for power development purposes. It declares that it shall be the duty of the owner of a water power to ensure as far as possible the economical and efficient use of the water by him; and provides for the appointment of an inspector to examine into the manner in which the water power is being developed and used. Upon reports of the inspector, the Government may make order as to the power, and in the event of the owner feeling himself aggrieved, he may be granted compensation. Under this act it would appear that the Government may restrict and limit the development of water powers, and the distribution of electrical energy by private owners or by municipal corporations.

The second act deals with the development of water power in the vicinity of Niagara Falls, and authorizes the Hydro Electric Power Commission of Ontario to divert the Niagara River, Welland River and tributary waters, and convey them by aqueduct or canal or in any other manner from any point on the Welland River, or on the Niagara River above the Cataract and discharge their waters into the Niagara River, for the purpose of the production of electric energy, and for such purpose to use all the powers conferred by the Power Commission Act. The cost of such works is to be defrayed out of funds appropriated for that purpose by the Legislature, and to be designated the Niagara Power Development Works account. Until this power is developed the commission may secure such additional power as is necessary to meet the requirements of the municipalities over and above the 100,000 h.p. required under existing contracts, upon the best terms available, and the additional cost of such power to the municipalities shall be included in the price per horse power payable by municipal corporations under existing contracts.

The third act is an amendment of the Power Commission Act, in which the authority of the commission was specifically set out in regard to certain matters. Bylaws confirming agreements as to power between the commission and a number of municipalities, and other contracts, which are set out in the schedules are ratified and confirmed.

During the discussion upon these bills, it was stated on behalf of the Government that it is not proposed to encourage any expenditure upon radial electric railways under the Hydro Electric Ry. Act of 1914, during the continuance of the war. Preparations for the construction of such railways will, however, be continued.

The Toronto Ry. and Subway Construction.—The Supreme Court of Canada dismissed the Toronto Ry. Co.'s appeal, May 2, against an order of the Board of Railway Commissioners assessing the company with 10% of the cost of building a subway under the C.P.R. at Avenue Road. The chief grounds of the appeal were the question of the Board's power to assess a provincial railway in regard to a subway under a Dominion railway, and also the rights of the company to the use of city streets. The amount to be paid by the company is \$8,000.

Mainly About Electric Railway People.

Percy Lewis has been appointed Purchasing Agent, British Columbia Electric Ry., vice C. A. Lee, transferred to electrical engineering department.

J. P. McKenzie, heretofore Master Mechanic, has been appointed Assistant Superintendent, Saskatoon Municipal Ry., Saskatoon, Sask. This is a new position.

Capt. Guy Boyer, of the 22nd Battalion, C.E.F., and formerly a Montreal St. Ry. official, is reported as under eye treatment in England owing to lachrymose gas effects.

F. D. Burpee, Superintendent, Ottawa Electric Ry., who is on leave of absence for military service, has been promoted from captain to major in the 207th Battalion, now stationed at Ottawa.

F. S. Woodcock, Traffic Manager, Saskatoon Municipal Ry., Saskatoon, Sask., having resigned on enlistment for service with the Canadian Expeditionary Force, the position has been abolished.

D. L. Welch, heretofore General Freight Agent, Chatham, Wallaceburg & Lake Erie Ry., is reported to have been appointed Travelling Auditor, London & Port Stanley Ry., London, Ont.

L. G. Ireland, heretofore Manager, Brantford Municipal Ry., has been appointed Assistant Engineer, Hydro Electric Power Commission of Ontario, in charge of operation of distribution systems, Central Ontario Power System.

Nugent M. Clougher, who was in Ottawa some two years ago, attempting to promote the Ottawa Rideau Lakes & Kingston Ry., has been granted a temporary commission as lieutenant in the Royal Naval Volunteer Reserve, and has been appointed to the s.s. President, additional for Royal Naval Air Service.

Wilford Phillips has been appointed General Manager, Winnipeg Electric Ry. Co., instead of Manager as heretofore. He returned to Winnipeg recently, after four months leave of absence, which he spent in California, being a large part of the time in the open air and doing a great deal of motoring in the Los Angeles district, which improved his health very much.

J. M. Ahearn, heretofore Assistant Master Mechanic, Ottawa Electric Ry., has been appointed Assistant Superintendent in charge of equipment, with control of the repair shop and car barns, and of matters dealing with rolling stock. He has worked in street railway electrical departments for some 15 years and had considerable experience on the Pacific Coast.

W. G. Ferguson, Local Manager, Peterborough Radial Ry., which has been bought by the Ontario Government with other Electric Power Co. property, and transferred to the Hydro Electric Power Commission of Ontario for management, remains in the same position as heretofore, reporting to L. G. Ireland, who has been given charge of operation of distribution systems, Central Ontario Power System.

Major Norman C. Pilcher, General Manager, Sherbrooke Ry. & Power Co., Sherbrooke, Que., who went on active service a little more than a year ago, has been killed in action in France. He was appointed General Manager, Sherbrooke Ry. & Power Co., Sept. 1, 1910, and for some time prior to that had acted as Manager of the Fort William and Port Arthur Electric Railways, then being

operated jointly. He is survived by a widow and one son, both of whom are at present in England.

D. L. Welch, who is reported to have been appointed Travelling Auditor, London & Port Stanley Ry., London, Ont., was born at Clinton, Ont., Feb. 29, 1892, and entered railway service, Nov. 24, 1909, since when he has been, to June, 1911, relieving agent, Buffalo Division, Pere Marquette Rd.; June, 1911, to May, 1913, cashier, same road, Wallaceburg, Ont.; May, 1913, to Feb., 1916, local freight and passenger agent, Chatham, Wallaceburg & Lake Erie Ry., Chatham, Ont.; Feb. 20 to May 13, 1916, General Freight and Passenger Agent, same road, Chatham, Ont.

Electric Railway Notes.

The Winnipeg Electric Ry. is carrying all soldiers in uniform, during all hours of all days, on workingmen's tickets, 8 of which are sold for 25c.

The Dominion Power & Transmission Co., Hamilton, Ont., has had 120 employees enlist for overseas service with the Canadian Expeditionary Force.

The City of Calgary, Alta., has passed a daylight saving bylaw, and the Calgary Municipal Ry. has been operated under the new time since May 7.

The Manitoba Public Utilities Commission has heard considerable further argument as to the expediency of compelling the Winnipeg Electric Ry. to operate its cars across the Arlington bridge, and decided May 10, to take the whole matter again into consideration. The question hinges upon what are adequate safety appliances on the cars.

The Winnipeg City Council, on April 24, adopted the daylight saving plan, and passed a bylaw declaring it in operation. The Winnipeg Electric Ry. started operating its cars in accordance therewith April 26. The Winnipeg, Selkirk & Lake Winnipeg Ry. cars to Selkirk and Stonewall continued to be operated on standard time.

The British Columbia Electric Ry. put a new time table in force April 10, between New Westminster and Chilliwack, the principal features of which are the allowance of more trains at the terminal, the last trains leaving each end an hour later than formerly, and the running of one train a day in each direction through between Vancouver and Chilliwack.

The Ontario Legislature has authorized the city of Windsor, and the towns of Walkerville, Sandwich, Ford City and Ojibway, to join in the formation of one public utilities commission to supervise all public utilities within their boundaries. It is claimed that this will effect some saving of expense, and that the unity of policy over a large area, will be of very great benefit to the area involved.

The Quebec Appeal Court, gave judgment, May 29, affirming the decision imposing a penalty of \$1,000 on M. Martin, Mayor of Montreal, for ignoring an interlocutory injunction restraining him, and the Montreal Board of Control from dealing with any proposed contract between the city of Montreal Tramways Co. The proposal referred to was the Hebert contract, which was before the Board in June, 1915.

The hearing of the case of Moodie against the Cataract Power Co., was concluded before an Ontario Supreme Court judge at Hamilton, Ont., May 6, the action being dispensed with costs. The

plaintiff, John Moodie, sought to recover \$6,624 alleged unpaid dividends on shares held by him. The Cataract Power Co., is one of the constituent companies of the Dominion Power and Transmission Co. The judge held that the plaintiff had failed to justify his claim.

The British Columbia Electric Ry. is substituting clear for ground glass windows in the partition between the motor-men's vestibule and the passenger section of its cars. Some 20 cars had been altered up to May 8, and if the experiment is approved by the public, the remainder of the cars will be altered accordingly. The opaque glass was put in some years ago because of a government order, but W. G. Murrin, General Superintendent, says it has many disadvantages.

An arrangement is reported to have been made between the British Columbia Government and the British Columbia Electric Ry., under which the company's employees are to have one day off work in every eight days, the agreement to come into effect June 15. The men are, as far as possible, to have short days on Sundays, but the entire working force is to hold itself in readiness for work on all holidays in addition.

A joint committee representing the municipal councils of Windsor and Walkerville, Ont., met May 18, to discuss a proposal to run motor busses on the streets in opposition to the Sandwich, Windsor & Amherstburg Ry.'s electric cars. Council has advised that a motor bus line is not a railway within the meaning of the agreement between the councils and the railway company, and may be operated by them without violating the franchise.

Brantford Municipal Ry. employees have asked the Department of Labor for the appointment of a conciliation board to enquire into conditions of service. Among other things which the men desire are one week holiday with pay, seniority in runs, abolition of outside running board on open cars, bi-weekly inspection, increased pay, shorter hours after the war, free uniform after one year of service, and abolition of charge for first \$10 worth of tickets.

The Manitoba Court of Appeal reserved judgment recently in the Winnipeg Electric Ry.'s appeal against an order of the Manitoba Public Utilities Commission, granted on the application of Winnipeg City Council, requiring the company to prevent the escape of electric current into the city's water pipes. The grounds on which the appeal were based were that the Public Utilities Act is unconstitutional, the Commissioners having the powers of a Superior Court judge, which powers can only be exercised by an officer appointed by the Dominion Government; and further, provided the Act were constitutional, then that the Commissioner exceeded his powers in making the order, the company's railway having been built in accordance with plans approved by the city.

Sale of International Transit Co.—The Algoma Steel Corporation has sold to the Great Lakes Power Co. its power plant and also the International Transit Co.'s street car line and ferry franchise at Sault Ste. Marie, Ont., but not the Trans St. Marys Traction Co.'s street car line in Sault Ste. Marie, Mich. The latter is still being handled by the Lake Superior Corporation's interests. James Heyworth, Harvester Building, Chicago, is the principal person interested in the Great Lakes Power Co.

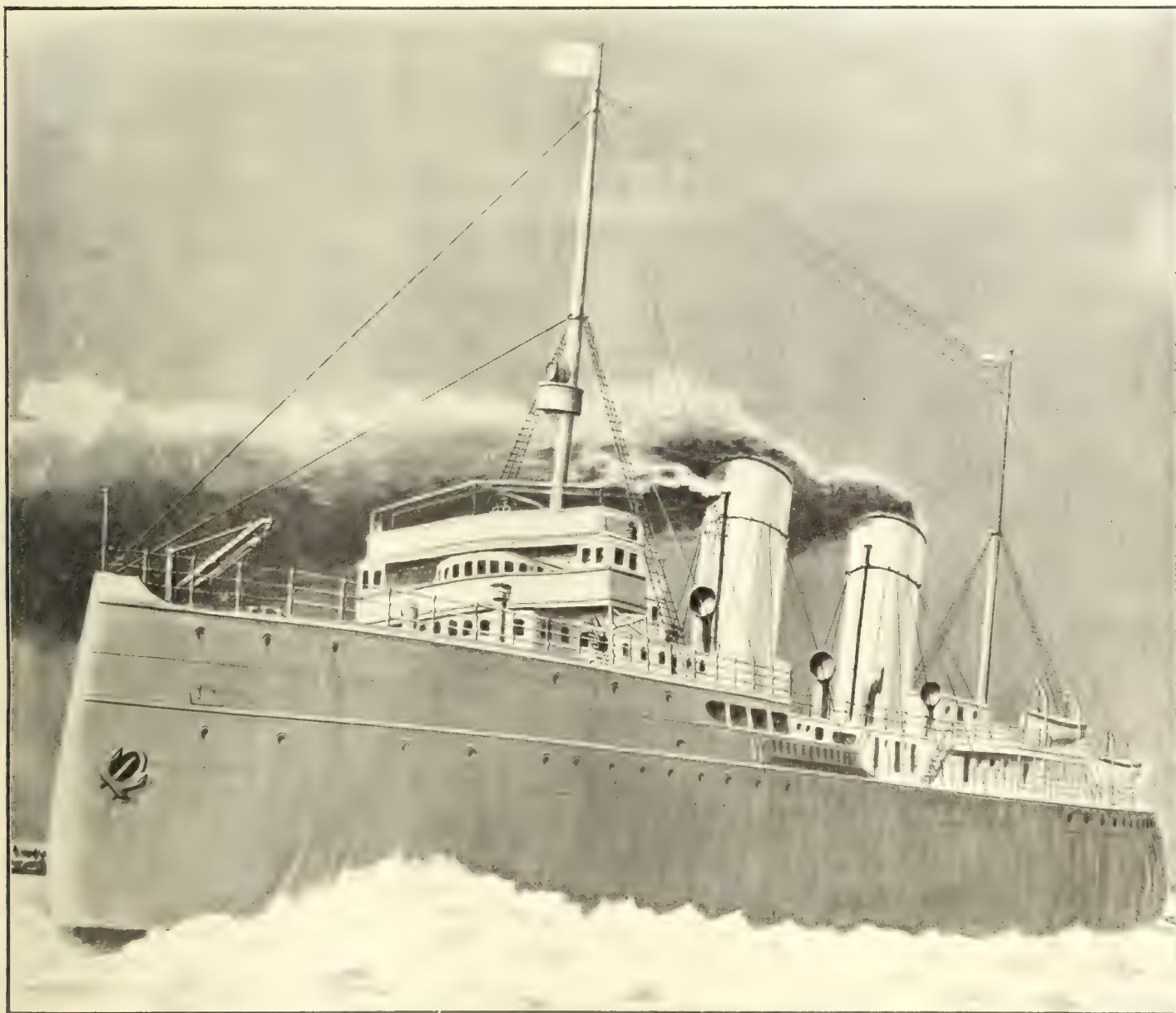
Marine Department

Launching of Icebreaking Steamship J. D. Hazen.

The Dominion Government icebreaking steamship, J. D. Hazen (named after the Minister of Marine), which was very fully described, with plans, in Canadian Railway and Marine World for May, was most successfully launched at Canadian Vickers, Ltd., works at Longue Pointe, Montreal, on May 15, at 2.30 p.m. The

two mechanical triggers, which were kept in position by an arrangement of levers and connected with two cords which led up to the launching platform. When Lady Borden cut the ribbons on the platform, this operated to release the two cords which held the triggers. The latter dropped, and the vessel started down the

Lewis referred to the fact that the building they were in had only a few years ago been a part of the St. Lawrence River's course, from which more than 36 acres had been reclaimed and filled in by dredging. He spoke of the work already accomplished in repairing a British cruiser and in building a number of submarines



Icebreaking Steamship J. D. Hazen.

christening was performed by Lady Borden, who was accompanied by the Prime Minister, Sir Robt. Borden, in the presence of a large company of invited guests. Lady Borden was presented by Canadian Vickers, Ltd., with a gold chain with a large diamond attached.

All the arrangements for the launching were carried out most successfully. At 7 a.m. the keel blocks on which the vessel was sitting were removed, so that she rested on her launch ways. On the arrival of the launching party, two bilge blocks on each side of the vessel were removed, and she was then held only by

ways. No hydraulic power was used. A novel checking arrangement was introduced. The vessel was checked, when off the ways, by chain drags fastened to one side of her only by flexible wire cables. This was arranged so that when the strain was taken on the ropes the vessel would not be deflected from her normal course.

After the launching the invited guests were entertained at luncheon in the moulding room, speeches being made by F. Orr Lewis, President of Canadian Vickers, Ltd., Sir Robt. Borden and Hon. C. J. Doherty, Minister of Justice. Mr.

for the British Navy.

Sir Robt. Borden referred, among other things, to the ancient pre-eminence of Canada in shipbuilding, more especially to what had been done in his native province of Nova Scotia. He saw no reason why Canada should not go forward to the undertaking of building steel ships, and why she should not rival in the future the record made by Nova Scotia in the past in building wooden vessels. He quoted a remark made to himself in Great Britain by the manager of one of the greatest shipbuilding companies there, that as the years roll by the cost of build-

ing steel ships in Canada will more and more approximate to the cost in the United Kingdom. He pointed out the great benefit to other industries which would result from the fact that a flourishing shipbuilding industry is nearly always associated with the products of iron and steel. The development here of a large shipbuilding industry would also be a great asset for Canada and the Empire should another great war occur.

P. L. Miller, General Manager, and H. Driver, Secretary-Treasurer, Canadian

Vickers, Ltd., who were in general charge of the arrangements for the launching, and for the entertaining of the guests, succeeded admirably, everything passing off most successfully and without a single hitch.

As stated in previous issues, the J. D. Hazen was intended for icebreaking work on the St. Lawrence River, particularly at Cap Rouge, but it is now said that she is to be transferred to the Russian Government. The vessel was designed by C. Duguid, Architect, Marine Department.

Canada Steamship Lines Ltd. Notes.

The s.s. Natironco, which was bought last year, has been thoroughly overhauled and had new boilers installed at the company's works at Sorel.

The s.s. Rosedale, which was given an extensive overhaul at Port Arthur recently, left Quebec May 16 for London with a cargo of deals.

The company is building a tug at Sorel for towing barges through the Welland Canal. She will be 65 ft. long, with 18 ft. beam, and will have fore and aft compound engines.

In consequence of the fire which occurred last autumn, a new electric power plant has been installed at the Manoir Richelieu, Murray Bay, and the entire hotel has been rewired.

The s.s. Syracuse, which will run this season between Quebec and Chicoutimi, on the Saguenay Division, has been fitted for salt water service at the company's works at Sorel by putting in surface condensers and fresh water tanks.

On account of the abnormally high price of fuel oil, owing largely to the

Dominion Canal Statistics for 1915.

The total traffic through Canadian canals during 1915, was 15,198,803 tons, a decrease of 21,824,434 tons from 1914.

The distribution among the various canals was:—

	Tons.	Increase Tons.	Decrease Tons.
Sault Ste. Marie..	7,750,957	.....	19,848,227
Welland	3,061,012	.....	799,957
St. Lawrence	3,409,467	.....	982,026
Chambly	478,707	41,802	.....
St. Peters	2,895	.....	51,285
Murray	30,728	.....	53,179
Ottawa	272,370	.....	62,762
Rideau	120,781	.....	30,958
Trent	49,904	.....	17,811
St. Andrews	21,982	.....	20,031

Total 15,198,803 41,802 21,866,236

The decrease at Sault Ste. Marie, which was equal to 91% of the whole, was 19,984,227 tons, and of this, 18,798,986 tons, or 94.9%, was U.S. traffic. The opening of a new lock on the U.S. side led to the diversion of a large amount of business which had in previous years taken the Canadian channel. This was particularly true during the autumn, when extreme pressure prevailed in the movement of Canadian wheat.

Following is a comparison of the freight movement, by months, in 1914 and 1915:—

	1914 Tons.	1915 Tons.
January	494	.....
April	554,111	398,350
May	5,307,123	1,426,805
June	6,136,657	1,472,670
July	6,339,831	1,587,611
August	6,261,380	1,829,021
September	6,069,946	2,424,717
October	4,660,484	3,354,829
November	1,470,471	2,278,245
December	222,740	426,555

Total 37,023,237 15,198,803

The net tonnage in 1915, eliminating all duplication, was 12,334,779. Of this, 4,931,954 tons were Canadian, and 7,402,825 tons U.S. Having regard, however, to Canadian traffic which passed through the U.S. canal at Sault Ste. Marie, the actual net tonnage of Canadian commerce was 6,734,223.

Traffic in 1915 was distributed among the various classes of commodities as follows:—

	1914 Tons.	1915 Tons.
Products of agriculture..	8,522,327	5,182,525
Animal products	19,301	11,289
Products of the forest...	1,678,925	1,096,111
Products of the mine...	39,951,661	1,494,778
Manufacturers	1,881,699	7,414,100

Total 37,023,237 15,198,803

The tonnage of Canadian and U.S. traffic in 1914 and 1915 was:—

	1914 Tons.	1915 Tons.
Canadian	9,282,206	6,789,423
United States	27,641,031	8,409,380

The foregoing figures apply to traffic through Canadian canals. A considerable volume of Canadian commerce has always passed through the U.S. canal at Sault Ste. Marie. In 1915 it amounted to 1,802,269 tons, which, added to the 6,789,423 tons transported through Canadian canals, creates a final total of 8,591,-

692 tons. As a matter of fact, the net tonnage of Canadian traffic was 144,183 tons greater in 1915 than in 1914.

In 1914 Canadian traffic through Canadian canals was equal to 25.3%. In 1915 it was 44.7%.

The proportions of the Canadian and U.S. tonnage through the Canadian canals were:—

Canals.	Total Traffic	Canadian Tons.	Per Cent.	U.S. Tons.	Per Cent.
Sault Ste. Marie.....	7,750,957	2,561,734	33.0	5,189,223	67.0
Welland	3,061,012	1,426,256	46.6	1,634,756	53.4
St. Lawrence	3,409,467	2,024,755	59.3	1,384,712	40.7
Chambly	478,707	292,191	61.0	186,516	39.0
St. Peters	2,895	2,895	100.0	.....	.....
Murray	30,728	27,942	90.9	2,786	9.1
Ottawa	272,370	267,406	98.1	4,964	1.9
Rideau	120,781	114,358	94.7	6,423	5.3
Trent	49,904	49,904	100.0	.....	.....
St. Andrews	21,982	21,982	100.0	.....	.....
Total	15,198,803	6,789,423	44.67	8,409,380	55.33

Cargoes of Canadian wheat moved eastward by water in 1915 totalled 170,117,861 bush., compared with 95,032,066 bush. in 1914. This passed the Sault canals as follows:—

	1914 Bush.	1915 Bush.
Through Canadian canal..	77,467,833	48,727,911
Through U. S. canal....	17,564,233	121,389,950

Total 95,032,066 170,117,861

There were also 9,967,941 bush. of Canadian wheat brought down in the form of flour making the final aggregate 180,085,802 bush.

The distribution of Canadian wheat in 1915 and 1914:—

	1914 Bush.	Per cent.	1915 Bush.	Per cent.
From Port Arthur, Fort William and Duluth.	10,283,166	10.8	4,025,010	2.4
To Montreal	24,864,466	26.2	25,315,999	14.9
Georgian Bay Ports.....	34,350,700	36.2	33,067,613	19.4
Other Canadian Ports.....	25,533,734	26.8	107,709,239	63.3
Buffalo .....	.....	.....	.....	.....
Total	95,032,066	...	170,117,861	...

For 1915 and 1914, freight rates on Canadian waterborne wheat were:—

	1914.	1915.
To Montreal:	.....	.....
Per ton per mile.....	0.124c.	0.132c.
Per bushel	4.58 c.	4.99 c.
Per ton	\$1.52	\$1.66
To Georgian Bay ports:	.....	.....
Per ton per mile.....	0.095c.	0.282c.
Per bushel	1.46 c.	3.54 c.
Per ton	48.61 c.	\$1.18
To other Canadian ports:	.....	.....
Per ton per mile	0.065c.	0.123c.
Per bushel	1.48 c.	2.84 c.
Per ton	49.29 c.	94.80 c.
To Buffalo:	.....	.....
Per ton per mile.....	0.061c.	0.159c.
Per bushel	1.63 c.	3.97 c.
Per ton	53.72 c.	\$1.32

The New Brunswick Telephone Co. held its annual meeting at Fredericton, May 18, when the report showed that the business had been satisfactory for the year, although the general growth had not been up to the standard shown before the war. It was decided to continue the payment of the 8% dividend as hitherto.

demand from the munition factories, the company will use coal instead of oil on its St. Lawrence River steamships, Rapids King and Rapids Prince, this season.

The s.s. Acadian and the s.s. D. A. Gordon are being overhauled at Longue Pointe, Montreal, after 12 months charter on the Atlantic coast. They and the s.s. Glenellah, which have been carrying coal from New York to St. John's, Nfld., will load in Montreal with deals for London.

The company is fitting up a dock at Quebec for handling coal for its vessels, which, owing to the shortage of ocean going tonnage, will this year use Ohio

coal instead of being supplied from the Maritime Provinces. A Brown hoisting machine, heretofore in use at Sarnia, Ont., is being transferred to Quebec and a similar one will be installed at Sarnia.

Dominion Assistance for Shipbuilding.
An Ottawa press dispatch says that a subcommittee of the cabinet is to be appointed to deal with the question of the advisability and the means of federal assistance for the development of a shipbuilding industry in Canada. This question was discussed on several occasions during the recent session, principally on behalf of Canadian shippers, who have been encountering difficulties through the shortage of ocean tonnage. The appointment of a ministerial committee to deal with the question will be followed by a careful study of the problems surrounding the building up of a Canadian shipbuilding industry.

Sale of Canadian Northern Steamships to Cunard Steamship Co.

The Canadian Northern Steamships, Ltd., a subsidiary of the Canadian Northern Ry., has sold its interests to the Cunard Steamship Co., the arrangement having been negotiated by D. B. Hanna, Second Vice President, C. N. Steamships, and Sir Alfred Booth, Chairman of the Cunard Co., much of the work in connection with the negotiations having been carried out in England by the C.N.R.'s European Traffic Manager, W. Phillips, acting under Mr. Hanna's instructions. The following announcement was made by Mr. Hanna early in May:—

"An agreement of great importance to the development of trade and passenger traffic with Canada has been concluded between the Canadian Northern Ry. and the Cunard Steamship Co., which provides for a very close working arrangement between the two parties. The Cunard Co. will take over the steamships which were running before the war from Avonmouth and Rotterdam, and will maintain service between Canada and ports in the United Kingdom and on the European Continent. The C.N.R. throughout the vast territory covered by its railway lines from the Atlantic to the Pacific coast will direct its efforts in favor of the Cunard Line, while the Cunard Line will in the same way work in favor of the C.N.R. The various Canadian services of the Cunard Line and the C.N.R. will thus in effect become a single transportation unit between Europe and Canada. Steamship services on the Pacific Ocean are also in contemplation. The agreement becomes operative at once, but its full effect will not be seen until after the conclusion of the war. The C.N.R. will be on land, what the Cunard Steamship Co. is on water, in the formation of a complete system of freight and passenger transportation to and from the Dominion, and ports in the United Kingdom and the European continent."

Canadian Northern Steamships Ltd. was incorporated under the Dominion Companies Act in Oct., 1909, with an authorized capital of \$2,000,000, and office at Toronto, with the following provisional directors, all of whom are connected in various capacities with the Canadian Northern Ry. Co.: F. H. Phippen, K.C., G. G. Ruel, G. F. Macdonnell, R. H. M. Temple and A. J. Reid. Early in 1910, three steamships were acquired, the *Helipolis*, *Cairo* and *Volturno*. The first two named were built at Glasgow, Scotland, for the Egyptian Mail Steamship Co., and had been operated between Marseilles, France, and Alexandria, Egypt. They were sister vessels, of the following dimensions,—length over all 545 ft., breadth 60 ft. 3 ins., depth to shelter deck 33 ft., tonnage 11,000, i.h.p. 18,000. They were equipped luxuriously, and were each driven by three sets of Parsons' compound steam turbines, and after a thorough overhauling and some slight alterations to make them suitable for Atlantic travel, were renamed *Royal George* and *Royal Edward*, respectively, special permission having been granted for the use of the word *Royal*.

The *Volturno* was purchased from the Northwest Transport Line, a concern in which Sir William Mackenzie was interested. She was built at Glasgow, Scotland, in 1906, and was of steel. Her dimensions were, length 340 ft., breadth 43 ft., depth 20.7 ft. tonnage 3,581 gross. She had been operated under charter by

the Uranium Steamship Co., between Halifax, New York and Rotterdam.

The company's Atlantic steamship service was inaugurated between Canada and England, May 13, 1910, when the s.s. *Royal Edward* sailed from Avonmouth, which place had been selected as the British port, for Montreal. She arrived at Quebec early in the morning of May 19, and at Montreal during the evening of the same day. This service was continued regularly, with Montreal and Halifax, as the summer and winter ports respectively, until the outbreak of war, except during the winter of 1913-14, when St. John was the winter port.

The s.s. *Royal George*, when making her last trip up the St. Lawrence before the winter of 1912, ran aground about a mile east of Point St. Lawrence, Island of Orleans, Nov. 5, and was considerably damaged in the bows. This however was soon repaired and she was replaced in service. The s.s. *Volturno* was burned at sea Oct. 10, 1913, and a number of passengers and some of the crew lost their lives, the captain being very highly commended for bravery. In Dec., 1913, the s.s. *Principe di Piedmonte*, built at Sunderland, Eng., in 1907, with a tonnage of 6,365 gross and 4,044 register, was purchased, renamed *Principello* and leased to the Uranium Steamship Co. in place of the *Volturno*, and in May 1914, *Principello* Steamships Ltd., was incorporated under the Dominion Companies Act, with \$150,000 authorized capital, to own the s.s. *Principello*.

On the outbreak of war in Aug. 1914, the steamship business carried on by the Uranium Steamship Co., of which company the Mackenzie and Mann interests were practical proprietors, came to an end; the s.s. *Uranium* was chartered to Canadian Northern Steamships Ltd., and *Campanello* Steamships Ltd. was incorporated under the Dominion Companies Act with, \$100,000 authorized capital, to take over the s.s. *Campanello*. The *Royal Edward* and *Royal George* were requisitioned by the Admiralty, thus leaving the company with three steamships, *Campanello*, *Principello* and *Uranium* in its service. The s.s. *Royal Edward*, which was first utilized in the transportation of Canadian troops to Europe, was later used as a prison vessel for interned Germans, off the English coast, and later again served as a transport for troops between England and the Dardanelles, and while on her second voyage as such, was torpedoed and sunk in the Aegean Sea, Aug. 14, 1915, when about 1,000 lives were lost, including the captain, Lieutenant Wootton, R.N.R., who had been in command of her ever since her acquirement by Canadian Northern Steamships Ltd.

Canadian Lights and Fog Signals.—

The Marine Department has issued three books of lists of lights and fog signals along the Atlantic Coast, including the Gulf of St. Lawrence to the head of ocean navigation; on the inland waters of the Dominion between Montreal and British Columbia, and on the Pacific Coast and the rivers and lakes of British Columbia. The lists are corrected to Apr. 1, and are distributed free to mariners on application.

G. D. Curtis, heretofore Manager, Western Department, Adams Ex. Co., has been appointed Vice President and General Manager.

Stranding of s.s. *Camosun* Investigated.

An investigation into the stranding of the Union Steamship Co. of British Columbia's s.s. *Camosun*, near Lima Point, Digby Island, B.C., Mar. 7, was held at Victoria recently, by Capt. J. D. Macpherson, Wreck Commissioner for British Columbia, assisted by Capt. R. Ridley and H. Parsons as nautical assessors. The court found that the stranding was entirely due to an abnormal current setting to the northward after a succession of southeast winds, and that in no sense can the master, E. A. Dickson, or any member of the crew, be blamed for the accident, and returned them their certificates with a considerable amount of satisfaction. The court also expressed its appreciation of the manner in which the Managing Director of the owning company spoke of the master of the *Camosun*, and stated that if those occupying the important and responsible position of steamship managers would take similar action, it might probably mean that accidents to steamships on British Columbia waters would be less frequent. The court also recommended that owing to this accident, a notice to mariners should be issued warning them that after a continuation of southeast or southerly winds, a set to northward must be expected along the shores of Digby Island. This, to the knowledge of the court, is a well known fact among the local fishermen in that district.

The s.s. *William C. Moreland*, which was formerly owned by the Interstate Steamship Co., Cleveland, Ohio, has been purchased by Canada Steamship Lines, Ltd., and is being repaired and overhauled at Superior, Wis. She was built there in 1910, and on her second trip, when downbound with iron ore, went ashore near Eagle River in Lake Superior, Oct. 18, 1910. The loss on the hull was \$420,000 and on the cargo \$40,000. At the time of the loss it was stated that she had been broken in two in two places, and that while wrecking operations might succeed in floating a portion of her, it was unlikely, the water being about 200 ft. deep within 30 ft. of where she stranded. She was abandoned to the underwriters, and later sold to the Reid Wrecking Co., Sarnia, salvaged and taken to Port Huron, where she was patched up sufficiently to allow of her being towed to Superior. Her dimensions were, length 580 ft., breadth 58 ft., depth 32 ft.; tonnage, 7,514 gross, 5,803 register. She was equipped with triple expansion engines with cylinders 24, 39 and 65 ins. diam. by 42 ins. stroke, supplied with steam by a single Scotch boiler 11½ by 16 ft.

The Dominion Government and Neutral Vessels.—The United States Secretary of State has officially announced that the Dominion regulations regarding the searching of neutral vessels are not intended by the Dominion Government to be applicable to vessels at river and lake ports, and any instructions that may have been issued in that behalf have been cancelled, but the rules will be enforced at all seaports.

The Dominion Government s.s. *Quadra*, which was sunk in collision with the C.P.R. s.s. *Charmer*, Feb. 26, off the entrance to Nanaimo harbor, has been raised by the Vancouver Dredging & Salvage Co., which bought the wreck. She was taken to Vancouver after raising, for examination.

Steel Shipbuilding and a Mercantile Marine for Canada.

In an address to the Canadian Manufacturers Association's Montreal Branch recently, Thos. Cantley, President and General Manager, Nova Scotia Steel & Coal Co., New Glasgow, N.S., dealt with the extraordinarily increased freight rates for ocean traffic, owing to the steadily decreasing tonnage available, and stated that so long as the war continued, no relief could be expected from outside sources. He pointed out that Canadian shipping only carried a small fraction of the lake freights, about one tenth of the whole of the produce sent from Canadian ports. He outlined the history of the up-building of the railways in the Dominion, and deplored the fact that the Government had not carried out a similar policy of assistance in regard to marine transportation. The canal system had cost over \$100,000,000 since confederation, but it was open to competitors, and over four-fifths of the traffic passing through the canals originated in the United States, while less than one-third of the vessels were Canadian. The Dominion had also spent \$150,000,000 on aids to navigation on the coast and inland waters, which were used by all in common, but the Government had done practically nothing towards building up the shipbuilding industry. There are a few Canadian ship yards equipped for the building of steel vessels, but they are all on the Great Lakes, and none on the Atlantic seaboard. He made comparisons in the output of wooden ships in the Maritime Provinces from 1874, when 190,756 tons were built in a year, and the tonnage on the register was 1,158,363, down to 1914, when the vessels built in the year were 43,436 tons, and the tonnage on the register was 932,422. He declared that he had no faith in any scheme for providing greater or more efficient transportation either through Government ownership, time charter or operation of a tramp steamer fleet, or by any other form of attempted control of ocean traffic by the Government, but considered that the Government would be justified in making a considerable expenditure by way of aiding in the development of shipbuilding at present. The iron and steel industry of Canada could never have reached the present output capacity save for the fostering influence of the combination of tariff protection and bounty. Steel shipbuilding on a comprehensive scale can be

developed if the Government is prepared to grapple with the matter in a broad and statesmanlike way. It is generally admitted that it requires from five to ten years to build up any good manufacturing organization, and this makes it necessary that any plan of assistance should be guaranteed for a period long enough for any new yards to get their organization established. Assistance might take the form of a rebate of duties paid on materials entering into the construction of a vessel, direct aid by way of bounty, or a combination of both. If vessels built outside Canada are to be admitted free to Canadian registry and trade, then at least an amount equal to the duty imposed on the material entering into the construction of Canadian built vessels should be returned to the builder. If the Government were to adopt the plan of ordering naval vessels and at the same time encourage mercantile construction, shipbuilding would expand rapidly, and Canada would the sooner be able to build naval tonnage at prices closely approaching those of other countries. Other matters dealt with were, marine insurance, inspection of machinery, re-casting of navigation laws, etc.

The question of aid to shipbuilding came up for discussion in the House of Commons, May 16, when immediate action by the Government was advocated in order to establish the building of steel vessels as a permanent industry. It was urged that the bonusing of steel vessel building was a natural corollary of bonusing the steel industry. The Prime Minister stated that the matter was being considered by the Government, but if a start were made now, either by way of subsidy or by Government ownership and construction, by the time manufacture was actually started the war might be over and the present premium on shipping be discounted by the return to normal conditions. He stated that from information he had received in England, he thought that in about 15 years vessels could be built as cheaply in Canada as in Great Britain. Several suggestions had been put forward by various companies interested in shipbuilding, but the Government did not feel justified in presenting any definite proposal to Parliament.

The name of the s.s. Onaping, no. 88,623, registered at Windsor, as owned by John Charlton, Lynedoch, Ont., has been changed to Lucknow. She was formerly a sailing vessel, and was built at Saginaw, Mich., in 1870.

Steamship Service Between Prince Edward Island and the Mainland.

Canadian Railway and Marine World for May gave very full particulars of the withdrawal from business and of the new Charlottetown Steam Navigation Co.'s arrangements for steamship service between Prince Edward Island and the mainland. Some further particulars are now available. As stated in our last issue, the s.s. Northumberland, which formerly ran between Summerside and Pointe du Chene, and latterly between Charlottetown and Pictou, has been sold by the C. S. N. Co. to the Dominion Trade and Commerce Department, which has transferred her to the Canadian Government Railways, under whose management she will run between Summerside and Pointe du Chene as long as that route can be navigated this year. She will be under command of Capt. A. Cameron, who was in command of the s.s. Empress last year, and prior to that vessel being built commanded the s.s. Northumberland, having been in the service for many years.

The service between Charlottetown and Pictou, N.S., heretofore performed by the s.s. Northumberland, will be performed by the Canadian Government Railways car ferry s.s. Prince Edward Island and the D.G.S. Stanley. The s.s. Prince Edward Island, as previously stated, has been built to run all the year round between Carleton Point, P.E.I., and Cape Tormentine, N.B., as soon as the terminals at those places are finished, which is expected to be before next winter.

The steamships Prince Edward Island, Stanley and Northumberland will be under the immediate charge of Capt. C. T. Knowlton, Superintendent of Ferries, Canadian Government Railways, Moncton, N.B., who reports to the General Superintendent there, J. K. McNeillie. The business handled by these vessels will be attended to by Canadian Government Railways departmental officials.

The s.s. Empress, heretofore on the Summerside-Point du Chene route, has been sold by the Charlottetown Steam Navigation Co. to the C.P.R., and was taken recently from Charlottetown to Halifax, N.S., where she was put in dry-dock. She will be run across the Bay of Fundy, between Digby, N.S., and St. John, N.B., replacing the s.s. Yarmouth and giving a faster service. Captain Walsh, Assistant Manager, Canadian Pacific Ocean Services, Ltd., Montreal, is in charge of the Bay of Fundy service.

List of Steam Vessels Registered in Canada During April, 1916.

List of Steam Vessels Registered in Canada During 1915											
No.	Name	Port of Registry	Where and When Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
126198	Case	Windsor, Ont.	Cleveland, Ohio	1889	286 0	42 5	22 0	2309	1347	130 sc.	W. N. Gatfield and Maisey, Sandwich, Ont.
126199	Henry B. Hall	Montreal	Detroit, Mich.	1881	220 0	35 0	17 6	1190	618	95 sc.	A. H. Lomer, Montreal
127000	M. Stewart (1)	Toronto	Buffalo, N.Y.	1899	58 0	16 0	6 0	52	32	27½ sc.	G. Osler and M. Lash, Toronto
127001	Modello	"	Kingston, Ont.	1915	66 4	12 2	4 8	46	29	6 sc.	Lake Simcoe Navigation Co., Toronto
127002	Riverton (2)	"	Bay City, Mich.	1896	451 0	46 6	23 1	4423	2684	196¾ sc.	Mathews Steamship Co., Toronto
127003	W. B. Morley	Montreal	Marine City, Mich.	1892	248 0	42 2	23 0	1913	1087	107½ sc.	A. Robineau, Montreal
127004	Willrose	Collingwood, Ont.	Collingwood, Ont.	1915	60 5	15 8	6 3	49	30	10½ sc.	W. Rose, Meaford, Ont.
(1) Formerly A. M. Stewart.			(2) Formerly L. C. Waldo.								

(1) Formerly A. M. Stewart.

(2) Formerly L. C. Waldo.

List of Sailing Vessels and Barges Registered in Canada During April 1916.

List of Sailing Vessels and Barges Registered in Canada During 1916										
No.	Name	Port of Registry	Rig	Where and When Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
131210	Gwendolen Warren	Liverpool, N.S.	Schr.	Liverpool, N.S.	1916	125 0	30 8	10 7	274	F. K. Warren, Halifax, N.S.
132135	Josephine	Quebec, Que.	Schr.	St. Romuald, Que.	1900	76 5	24 0	6 8	72	W. Guimont, Matane, Que.
137990	Lobnitz Rock Breaker No. 2	Vancouver, B.C.	Dredge	Matane, Que.	1915					Minister of Public Works, Ottawa
134178	Winnifred Lee	Shelburne, N.S.	Schr.	Vancouver, B.C.	1913	100 4	38 0	8 8	512	G. A. Buffett, Grand Bank, Nfld.
				Shelburne, N.S.	1916	106 5	24 0	10 3	77	

Atlantic and Pacific Ocean Marine.

The New Zealand Shipping Co.'s s.s. *Matatua*, which was damaged by fire and explosion at St. John, N.B., recently, has been refloated and temporary repairs have been undertaken locally.

The British s.s. *Ennisbrook*, from Quebec outward bound, was caught in the ice near Glace Bay, N.S., May 16, and driven ashore. She was floated May 19 and proceeded to Sydney, N.S., in tow of the *Douglas H. Thomas*.

The British s.s. *Hendon Hall*, which sailed from Louisburg, N.S., Apr. 11, for Rotterdam, has been sunk. She was owned by the West Hartlepool Steam Navigation Co., and has been on the Canadian route for some time.

The Oceanic Steam Navigation Co. (White Star Line) reports a very successful year during 1915, with a surplus of \$9,841,425. This is in addition to the certain profits in excess of a certain percentage, payable to the British Government. The dividend of 65%, which dropped to 35% in 1914, has been resumed.

The Canadian Ex. Co. has been given judgment for \$10,800 due, and \$7,200 in lieu of notice, against the Hamburg-American Steamship Co., for rent of offices in the Canadian Express Building, Montreal. The company ceased to do business in Canada on the outbreak of war, and closed its offices.

The White Star s.s. *Cymric*, while en route from New York to a British port, was torpedoed off the Irish coast, May 8. An attempt was made to run her into an Irish port before she sank, but this was not successful. Five lives were lost in the explosion of the torpedo, but all the other members of the crew were saved.

The C.P.R. s.s. *Empress of Asia* arrived at Vancouver, May 6, from Hong Kong, on her first trip since being released from Admiralty service, in which she has been constantly engaged since the commencement of war. She was actually released about the beginning of the winter, and has since been thoroughly overhauled and refitted.

The Dollar Steamship Co. is reported to have purchased the British s.s. *Strathardle* from Burrell & Sons, Glasgow, Scotland, for operation on the Pacific Ocean between Vancouver, B.C., and the Orient. The company's s.s. *Robert Dollar* is reported to have been sold to Japanese parties for \$1,000,000 and delivered to the new owners at Vladivostok.

A press dispatch from Copenhagen, Denmark, states that owing to the exceptional shortage of shipping, any vessels, so long as they float, are being pressed into service between Scandinavian ports. Two sailing vessels, it is said, which were built, one in 1776 and the other in 1786, have been overhauled and rigged and placed in service.

The s.s. *Bayern* opened the St. Lawrence navigation season, when she arrived at Montreal, May 1. She was formerly German owned, but was captured by the Italians in the early stages of the war, and is now being operated under the Italian flag as a freighter. The Allan Line s.s. *Sicilian* was the first passenger vessel to arrive in the St. Lawrence, landing passengers at Quebec, May 2.

The Battle Line s.s. *Eretria* was sunk, presumably by a torpedo, near France, May 12. She was owned by the Steamship *Eretria* Co., Ltd., Rothesay, N.B., controlled by Wm. Thomson & Co., and was one of a number of vessels controlled by this firm, all with Grecian names. She

was built at Glasgow, Scotland, in 1901, and was screw driven by engine of 303 n.h.p. Her dimensions were, length 341 ft., breadth 47½ ft., depth 23.5 ft.; tonnage, 3,464 gross, 2,255 register. She was operated from Canadian ports to Great Britain, and has latterly been engaged in war transport service.

Maritime Provinces and Newfoundland.

The s.s. *Cissy*, under charter to the Dominion Coal Co., ran aground near St. Esprit, N.S., when en route to Sydney, May 1.

The Nova Scotia Steel & Coal Co. is establishing a shipbuilding plant at New Glasgow, the first vessel to be built at which will be for the company's own service.

The exports passing through St. John, N.B., for the fiscal year ended Mar. 31, were \$120,048,580, against \$43,872,932 for the previous year. The increase is largely due to the shipment of war supplies.

Liverpool, Eng., cablegram, May 23:—A provisional agreement for the amalgamation of the Cunard and the Commonwealth and Dominion Steamship Lines is officially announced. This extended the Cunard influence to Australia and New Zealand.

The Dominion Government has granted a subsidy to the St. John River Steamship Co., for a service to be given by the s.s. *Elaine*, between Gaspe Basin, Dalhousie and Campbellton. The report that the Government purchased, or chartered the vessel, is incorrect.

An order in council has been issued restoring the compulsory payment of pilotage dues in the pilotage district of Parrsboro, N.S. The original order in council providing for such compulsory payment was made in 1881, and cancelled in 1900.

The old shipping agency business of S. Cunard & Co., Halifax, N.S., has been transferred to the Robert Reford Co., Montreal, who will continue to act as agents for the Cunard Line, as well as the Donaldson, Thomson, Cairn and Crown Lines. S. Cunard & Co. were the first agents for the Cunard Line, which originated in Halifax.

The s.s. *Hampstead*, owned in St. John, N.B., will probably be placed on the Fredericton-Gagetown route this year, under a new ownership. It is reported that J. Williams, formerly chief engineer on the s.s. *Victoria*, destroyed by fire recently, will be the purchaser, and that the Dominion Government has promised a subsidy of \$800 for service over the route named.

Some attempts were made recently to salve the s.s. *Desola*, formerly owned by the Reid-Donald Steamship Co., Montreal, which was practically destroyed by sulphuric acid and fire, and sunk, at St. John's, Nfld., some time ago. On account of the condition of the hull, which was found to be so corroded by the acid that it would not be able to stand any pressure, the attempts were abandoned.

The exports through St. John, N.B., by the C.P.R. for the winter season closed recently, were 916,103 tons, against 486,668 for the previous winter season. The total for April was 199,229 tons, against 66,084 tons in Apr., 1915. The imports by the C.P.R. for the same periods were: winter season 1915-16, 61,232 tons; for 1914-15, 59,107 tons; Apr., 1916, 14,410 tons; Apr., 1915, 8,816 tons. These fig-

ures do not include exports of grain and lumber.

The Shepody Navigation Co., which, as announced in our last issue, was offering its s.s. *Wilfrid C.* for sale, is requesting that the City of Moncton, N.B., pay the full subsidy for 1915, instead of only \$250 as suggested. It is claimed that the company performed the full service in the expectation of receiving the subsidy. F. W. Sumner, President, urged that the service be continued, as communication between the city and down river points was necessary.

The wooden vessel which is under construction at Meteghan, N.S., for A. B. Mackay, Hamilton, Ont., will be of the four masted schooner type and about 500 net tons, built to register 12 years in the American Bureau of Shipping. Her dimensions will be, length of keel 150 ft., beam 36 ft., depth of hold 13 ft.; tonnage, about 500 tons. She will be completed by about November. Construction is being carried on under the supervision of Capt. G. L. Wetmore, Yarmouth, N.S.

The Minister of Trade and Commerce announced in the House of Commons recently that he had been able to secure the s.s. *Elaine* for service between Campbellton and Gaspe ports, and that she would make fortnightly trips from Campbellton to Gaspe and from Campbellton to Paspébiac, one service through to Gaspe, and one service through to Paspébiac each week. The s.s. *Elaine*, which is registered as being owned by the St. John River Steamship Co., was built in 1888, and is screw driven by engine of 31 n.h.p. Her dimensions are, length 112.7 ft., breadth 23.8 ft., depth 7.8 ft.; tonnage, 272 gross, 156 register.

The C.P.R. has purchased the Charlottetown Steam Navigation Co.'s s.s. *Empress*, for its Bay of Fundy service. She was built at Newcastle upon Tyne, England, in 1906, and was operated by the company between Prince Edward Island and the mainland, from that time until the retirement of the company from business, as announced in our last issue. She is equipped with engine of 365 n.h.p. driving a screw, and her dimensions are, length 235 ft., breadth 34.2 ft., depth 20 ft.; tonnage, 1,342 gross, 612 register. She is said to have a speed of about 16½ knots, which is considerably faster than the s.s. *Yarmouth*, at present in the St. John-Digby service.

Province of Quebec Marine.

The Lachine Canal was refilled May 3, after having been empty for five days for repairs to water mains crossing under it.

A pontoon, 200 ft. long by 42 ft. deep, is to be placed at the Napoleon wharf, Quebec, this summer, for the safe mooring of steamships.

The name of the steamship *William A. Haskell*, no. 138,108, and *William J. Averell*, no. 138,108, of Montreal, have been changed to *Joyland* and *Oatland* respectively.

The Quebec & Levis Ferry Co.'s annual meeting was held at Quebec, May 16. Following are the directors for the current year:—C. H. Shaw, President; J. S. Thom, Vice President; A. Gourdeau, G. E. Allen Jones and L. C. Webster.

Steamer *Colin W. Ltd.* and steamer *Marion W. Ltd.*, have been incorporated under the Quebec Companies Act, each with \$10,000 capital and office at Quebec, to carry on a general shipping business. The incorporators are L. C. Webster, H. Aird, Montreal, and W. Q. Stobo, H. C. Thorn and C. St. J. Griffiths, Quebec.

The entrance piers to the graving dock under construction at St. Joseph de Levis, have been completed, and the excavation of the dock proper has commenced. The excavation will be to a depth of 60 ft., and the area will be about 138,000 sq. ft. The completed dock will be 1150 ft. long by 120 ft. wide at the base and 144 ft. at the top.

An order in Council has been passed approving a number of amendments to the bylaws for the Quebec pilotage district, the chief of which is the confirmation of the Minister of Marine as the pilotage authority, with power to appoint a Superintendent and Assistant Superintendents, who shall have immediate control of pilotage affairs under the direction of, and responsible to, the Minister.

An addition to the Montreal Harbor Commissioners' elevator 1, which was completed recently, was officially opened and machinery started, by Lady Borden, May 15. With this addition, Montreal has now the largest seaport elevator in the world. After the opening, a silver tray, with an engraving of the elevator on it, was presented to Lady Borden by W. G. Ross, Chairman of the Commissioners.

The Dominion Iron and Wrecking Co. has acquired the rights to the derelict s.s. Bavarian, formerly owned by the Allan Line Steamship Co., and which was wrecked at Indian Cove, Que., in 1906. J. G. Mayer, Quebec Manager of the company, is reported to have said that it is the intention to float and remove the wreck. The company has been successful in larger undertakings, notably in clearing the wreckage of the partially built Quebec Bridge which collapsed in 1907.

Ontario and the Great Lakes.

Canada Steamship Lines, Ltd., started its Toronto to Niagara service, May 8, with the s.s. Cayuga.

The Public Works Department received tenders May 30, for dredging at Port Maitland, the greater portion being required to be done by hydraulic dredge.

The Canadian Shipping Co.'s s.s. John B. Ketchum 2nd, which ran ashore on the

canal bank near Cardinal, Ont., May 7, was released May 10 with little damage.

The Bassett Steamship Co.'s s.s. Mariska lost her rudder during a heavy gale off Saginaw, Mich., May 11. She was taken into Detour, and later to Collingwood for repairs.

The Northern Navigation Co.'s s.s. Noronic has been chartered for a trip between Detroit, Mich., and the Georgian Bay, June 13, by a party of automobile engineers.

Canada Steamship Lines s.s. Aletha, which ran aground near Bath, May 1, on her first trip this year, to Picton, was released with comparatively small damage on the following day.

The service which has been in effect between Bay of Quinte ports and Charlotte, N.Y., for over 30 years, has been withdrawn, and the s.s. Caspian, now owned by Canada Steamship Lines, Ltd., has been transferred to other service.

The s.s. Centurion, owned by the Hopkins Transportation Co., Cleveland, Ohio, sank in the Livingstone Channel, Detroit River, May 17, after striking a bank some two miles above. She was refloated May 20, and was taken to Cleveland by the tug A. C. Harding.

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater for April, as follows:—Superior, 602.38; Michigan and Huron 579.92; Erie, 572.42; Ontario, 246.40. Compared with the average April levels for the past ten years, Superior was 0.84 ft. above; Michigan and Huron, 0.34 ft. below; Erie, 0.04 ft. above, and Ontario, 0.03 ft. above.

A deputation of business men from Chatham waited on the Minister of Public Works recently, to urge the dredging of the River Thames to a depth of 14 ft. from Chatham to the mouth of the river. A survey was made by the Government some time ago, and it was understood that the work was to be undertaken, but it is presumed that the war has postponed it for a time.

Press reports state that the Northern Navigation Co. will not operate a vessel on the through run between Georgian Bay ports and Cleveland, Ohio, this year. In

previous years, this service was given by the s.s. City of Midland, which was destroyed by fire last autumn, and for the current year, arrangements had been made with Canada Steamship Lines, Ltd., that the s.s. Rochester would take her place, but it is now stated that the Rochester will not be in service for the present owing to a lawsuit.

With the return of summer, the proposal to establish a dry dock at Owen Sound, is again to the fore. In the spring of 1915, F. F. Wood of Niagara Falls, since deceased, stated that a company to be named the Canadian Drydock & Shipbuilding Co. was to be organized for the purpose of locating a plant at Owen Sound, and that all the necessary financial arrangements had been completed, and negotiations were then proceeding with the Dominion Government with regard to a subsidy in aid being granted for a dock of the first class, instead of a second class type, as previously proposed. The ratepayers of Owen Sound have already passed a bylaw granting \$200,000 for the scheme. Since the death of F. F. Wood, the matter is being taken up afresh and hopes are being entertained in Owen Sound that something will be done.

Manitoba, Saskatchewan and Alberta.

The Peace River Tramway & Navigation Co.'s s.s. D. A. Thomas, was expected to be launched towards the end of May. She was built at Peace River Crossing, Alta., for operation during the summer, between Peace River and Vermillion Rapids. She has accommodation for 110 cabin passengers and about 300 tons of freight, and is equipped with engine of 800 n.h.p., with cylinders 20 by 84 ins. She is 165 ft. long with 35 ft. beam. J. P. Bucey has been appointed captain, and H. J. Hutchinson, chief engineer. The company is controlled by Baron Rhondda (D. A. Thomas), and its affairs are managed in Canada by C. F. Law, Vancouver, B.C.

British Columbia and Pacific Coast.

The Western Shipping Co., Ltd., has been incorporated under the British Columbia Companies Act, with \$40,000 authorized capital and office at Victoria, to build, own and operate steam and other vessels and to carry on a general navigation and transportation business.

Navigation has been reopened on the Fraser River between Prince George and Quesnel, a service between given by the motor boats Rounder and Circle W., each making two round trips a week. An automobile stage line is run by the Inland Express Co. between Quesnel and Barkerville twice a week.

It is reported that the Grand Trunk Pacific Coast Steamship Co. is providing stateroom accommodation for second class passengers on its steamships Prince George and Prince Rupert. Each vessel is to have 6 four-berth and 1 two-berth second class staterooms. The change is stated to have been made on the Prince Rupert, and to be in progress on the Prince George.

The Vancouver Shipmasters' Association is urging the installation of additional aids to navigation at various points along the coast. Among these are a fog signal at Kinnahan Islands, a lighted beacon on the rock at the entrance to Secret Cove, and a lighted beacon on the ledge of rock before Pender Harbor. It

Saulte Ste. Marie Canals Traffic.

The following commerce passed through the Saulte Ste. Marie Canals during April.

ARTICLES		U. S. CANAL	CANADIAN CANAL	TOTAL
Copper.....	Eastbound			
Grain.....	Short tons			
Building stone.....	Bushels	2,144,744	1,430,880	3,575,624
Flour.....	Short tons		25,260	25,260
Iron ore.....	Barrels	693,591	181,716	875,307
Passengers.....	Short tons			
General merchandise.....	M. ft. b.m.		754	754
Passengers.....	Bushels	16,207,085	4,654,832	20,861,917
General merchandise.....	Short tons	19		19
Passengers.....	Number		15	15
Coal, hard.....	Short tons	100,800		100,800
Coal, soft.....		477,798	27,800	505,598
Flour.....	Barrels			
Grain.....	Bushels			
Manufactured iron.....	Short tons	5,822	227	6,049
Iron ore.....	Short tons			
Salt.....	Barrels	31,999	14,000	45,999
General merchandise.....	Barrels	19,762	9,438	29,200
Passengers.....	Short tons		34	34
Passengers.....	Number			
SUMMARY				
Vessel passages.....	Number	530	168	698
Registered tonnage.....	Net	1,721,949	378,445	2,100,394
Freight—Eastbound.....	Short tons	1,216,228	350,687	1,566,915
—Westbound.....		608,982	39,465	648,447
Total freight.....		1,825,210	390,152	2,215,362

The Canadian canal opened April 18 and the U.S. canal opened April 20.

is suggested that the grounding of the s.s. Camosun on Digby Island recently might have been prevented if a signal had been placed on Kinnahan Islands.

Seamen employed on steamships sailing out of British Columbia are agitating for increases in pay and improvements in working conditions. They are asking as follows: deck hands \$55 a month for a 9 hour day, and 50c an hour overtime, Sunday and holiday work to be outside of ordinary duty; firemen, \$60 a month; stewards, an increase of \$10 a month. The matter is under consideration, and it is stated that the decision of Capt. J. W. Troup, Manager, B.C. Coast Service, C. P.R., will be accepted by the vessel owners.

Vancouver Island Marine, Ltd., has been incorporated under the B.C. Companies Act, with \$250,000 authorized capital and head office at Victoria, to carry on a general shipbuilding business, under the bill by which the Province is to grant aid to vessels built locally. C. J. V. Spratt, Victoria, is chiefly interested in the company, and it is stated that the building of one or more vessels for the off-shore lumber trade will be proceeded with as soon as possible. Plans have been prepared for a four masted barquentine, which type is considered the best for the trade. This is the first company formed to take advantage of the legislative aid.

The s.s. *Algonquin*, which was purchased recently from the Port Colborne and St. Lawrence Navigation Co., Toronto, a subsidiary of the Maple Leaf Milling Co., by A. B. Mackay, Hamilton, Ont., has been sold to the Wasis Steamship Co., Ltd., a subsidiary of the Nova Scotia Steel & Coal Co., New Glasgow, N.S. She is now being reclassified and refitted, but, at the time of writing, it has not been decided as to what route she will be operated over. She was built at Yoker, Scotland, in 1888, for Thomas Marks & Co., Port Arthur, Ont., and was sold in 1893 to the St. Lawrence & Chicago Steam Navigation Co., Toronto, and lengthened to her present full Welland Canal size. The latter company sold her to the Port Colborne & St. Lawrence Navigation Co. in 1913. She is of steel, divided into three compartments, and has hatches 24 ft. centres, and is equipped with triple expansion engines with cylinders 21, 33 and 54 ins. diam. by 36 ins. stroke, 1,000 i.h.p. at 70 r.p.m., and supplied with steam by two Scotch boilers under forced draught at 160 lbs. Her dimensions are, length 245 ft., breadth 40 ft. 1 in., depth 20½ ft.; tonnage, 1,806 gross, 1,172 register.

Wooden Shipbuilding in the Maritime Provinces.—Recent enquiries for the construction of six ocean going wooden barges of 3,000 tons dead weight capacity each within three months of placing the order, elicited the fact that owing to the difficulty of securing materials and labor, this could not be undertaken, but that three vessels of this type could be built. The cost was given as \$100 a registered ton, which is considered extremely high, and a further offer to build at cost plus 5% is under consideration.

The Buffalo & Fort Erie Steamship Co., Ltd., has been incorporated under the Ontario Companies Act, with authorized capital of \$100,000 and office at Fort Erie, to build, own and operate steam and other vessels, and to carry on a general merchandise and transportation business. The incorporators are, A. Fasken, D. McArthur, G. H. Sedgewick, J. O. Buckley and A. T. Struthers, Toronto.

Mainly About Marine People.

Richard Clancy, who has been in the Allan Line service for 32 years, has been appointed Port Agent, Canadian Pacific Ocean Services, Ltd., Quebec, Que.

D. R. Campbell, shipbuilder, Sydney, N.S., who died there recently aged 51, had been associated with the shipbuilding trade in Sydney for about 18 years.

W. C. Casey, General Agent, Passenger Department, Canadian Pacific Ocean Services, Ltd., Winnipeg, left during May for a two months trip to China and Japan.

James A. Allan, whose death was announced in our last issue, was a grandson of Capt. Alex. Allan, the founder of the Allan Line, and was connected with the service from early life. He was a director of the Allan Line from 1884 to 1909, and after the latter date took no active part in the business.

Capt. Edwin Dunn, a prominent lake navigator, for several years in command of Dominion Government fisheries protection steamships, died recently after a long illness. He was buried at Owen Sound, May 22. The last vessel under his command was the *Vigilant*, stationed on Lakes Ontario and Erie, and he retired to occupy a shore position for the Ontario Government, in 1907.

Joseph M. Shea, who has been appointed New England Passenger Agent, Canada Steamship Lines, Ltd., Boston, Mass., was born at Springfield, Mass., Feb. 14, 1879, and entered transportation service, June 24, 1899, since when he has been, to June 10, 1900, ticket agent, Boston and Maine Rd. and Central Vermont Ry., Brattleboro, Vt.; June 10, 1900, to Sept. 24, 1904, City Ticket Agent, G.T.R. and Central Vermont Ry., Boston, Mass.; Sept. 24, 1900, to May 1, 1916, Travelling Passenger Agent, same railways, Boston, Mass.

A. J. Blaisdell, who was appointed General Agent, Passenger Department, Canadian Pacific Ocean Services, Ltd., Shanghai, China, in January, died at Washington, D.C., May 10. He had been in C.P.R. service for several years, and prior to Oct., 1908, was City Passenger Agent, St. Louis, Mo.; Oct., 1908, to Mar., 1913, General Agent, Passenger Department, Cincinnati, Ohio; Mar., 1913, to July, 1914, General Tourist Agent, Montreal; July, 1914, to Jan., 1916, General Agent, Passenger Department, Railway and Steamship Lines, St. Louis, Mo.

J. F. Dolan, who has retired from the position of General Agent, Passenger Department, Canada Steamship Lines, Ltd., Boston, Mass., to enter private business in Montreal, was entertained to luncheon and presented with a silver tea set by a number of transportation representatives at Boston, May 2. He entered steamship service in 1893, as City Passenger and Ticket Agent, Richelieu and Ontario Navigation Co., Toronto, and in 1901 was appointed Passenger and Stock Transfer Agent, same company, Montreal. From 1913 to 1914, he was District Passenger Agent, same company at Boston, Mass., since when he has been General Agent, Passenger Department, Canada Steamship Lines Ltd., there.

C. E. Croft, recently appointed Chief of the Commissary Department, Canada Steamship Lines, Ltd., Toronto, was born at Cobourg, Ont., Aug. 26, 1882, and entered steamship service in Apr. 1904, since when he has been, to 1907, stenographer, Passenger Department, Richelieu & Ontario Navigation Co., Montreal; 1907 to 1911, secretary to Traffic Manager, same company, Montreal; 1911 to

1913, chief clerk, Traffic Department, Montreal; 1913 to 1914, chief clerk to Manager, Eastern Lines, same company, Montreal; 1914 to 1915, chief clerk to Operating Superintendent, Canada Steamship Lines, Ltd., Montreal; 1915 to March 1916, General Agent, same company, Toronto.

The Imperial Oil Co.'s s.s. Iocolite was launched at Collingwood, Apr. 29. This is the second of three vessels which the company is having built there. They are of steel, 258 ft. long, 43 ft. beam and 18 ft. deep to main deck, with an expansion trunk 7½ ft. above the deck running fore and aft. The hull is fitted with closely spaced bulkheads athwartships, and a continuous longitudinal bulkhead to divide the hold spaces into 10 tanks for crude or refined oil, and 4 tanks for carrying lubricating oil. A cross bunker for fuel oil is fitted forward of the boiler room, and the pump room is located at the fore end of the foremost tank. The vessel is to have a speed of 8 knots an hour when fully loaded.

British Government War Risk Insurance.—The British Government, in connection with the insurance of ships' cargoes against war risks, has adopted a new method of dealing with these insurances, which effects a considerable saving in clerical work, and at the same time is of advantage to merchants and brokers in the expedition of their business. Under the old system, a policy to cover war risk was issued for each insurance, but under the present scheme, a floating policy for a very large amount has been effected, and the slips, that is, the detailed applications for insurance, are themselves validated as certificates entitling the holders to the benefit of the floating policy.

Rules of the Road for the Great Lakes. The Marine Department has issued a booklet containing the rules of the road for the Great Lakes, as adopted by order in council, Feb. 4. They cover the territory including Georgian Bay and connecting and tributary waters and the St. Lawrence River as far east as the lower exit of the Lachine Canal, and the Victoria Bridge, Montreal, and are a revision of former rules, with no changes of importance with regard to the lights and signals to be used. Special regulations for the operation of motor boats are included in the new edition.

Quadra-Charmer Collision.—Subsequent to the delivery of the judgment on the collision between the Dominion Government s.s. *Quadra* and the C.P.R. s.s. *Charmer*, near Nanaimo, B.C., Feb. 26, in which the former vessel was lost, it was announced, as stated in our last issue, that the master of the *Quadra* intended, on the advice of counsel, to appeal to the Minister of Marine against the judgment, on the ground that the finding was opposed to the trend of the evidence. We were advised recently that the Department of Marine had received no intimation of an appeal. One of the nautical assessors dissented from the judgment rendered.

Coasting Voyages Extended.—The Dominion Parliament has amended the Canada Shipping Act, extending the definition of a coasting voyage, to mean a voyage between any port in Canada and any other port in Canada, Newfoundland, Labrador, St. Pierre-Miquelon, United States, Mexico, Central America, the West Indies or the eastern coast of South America, and on the coast of Alaska, or the western coast of South America, not farther south than 40 deg. south latitude.

Stranding of the s.s. Kenkon Maru Investigated.

An investigation was held at Victoria, B.C., recently, into the causes of the stranding of the Japanese s.s. Kenkon Maru No. 3, on the Belle Chain reef, on the south side of the Gulf of Georgia, Jan. 12. Capt. J. D. Macpherson, Wreck Commissioner for British Columbia, presided, and was assisted by Capt. Ridley and Parsons as nautical assessors. The judgment stated that the evidence, so far as the captain, officers and crew of the Kenkon Maru were concerned, was clear and convincing, but that the reverse was the case with the only British witness examined, viz., J. E. Butler, a pilot belonging to the Nanaimo District, to whom the vessel had been entrusted. The court regretted to say that it had rarely heard evidence of a more evasive and contradictory nature, and it was evident that it was given for the sole purpose of misleading and deceiving the court as much as possible as to what were really the causes of the stranding. It was successful to a great extent, but as is generally the case in evidence of this character, it was too transparent, and proved the witness's undoing. The court therefore, after having studied the evidence, which, with the exception of Butler's, had all been translated from Japanese, found that the sole blame for the stranding must be imputed to J. E. Butler, the pilot in charge at the time. Instead of taking every precaution under the circumstances then existing, he navigated the vessel in a most careless and casual manner, taking no notes of time, courses or anything else, and when the weather became densely thick with snow, he, with absolute disregard of article 16, and uncertain of his position as he must have been, went on blindly at full speed, without even the engine room telegraph at stand by, until

the vessel struck the rocks. As this was not his first accident, and as a warning to others, he was fined the costs of the investigation, \$230. No blame was attached to the officers and crew of the Kenkon Maru, as they were strangers on the coast, and naturally had an instinctive respect for, and confidence in, a British pilot. There was no excessive deviation in the vessel's compasses, and any such did not contribute to the stranding.

We are advised that an appeal against the court's decision has been decided upon.

Rumored Sale of Montreal Transportation Co.'s Business.

In the early part of May, rumors were current to the effect that A. B. Mackay, formerly of R. O. & A. B. Mackay, Ltd., Hamilton, Ont., who has lately been dealing considerably as a vessel broker, in conjunction with "a prominent Chicago financier," had secured control of the Montreal Transportation Co., and that the Nova Scotia Steel & Coal Co. held the balance of the stock. A. B. Mackay's investment was mentioned as being in the neighborhood of \$500,000.

Montreal Transportation Co. officials were reported, May 8, to have declined to discuss the report more than to say that while there had been negotiations, nothing had been consummated. The Nova Scotia Steel & Coal Co. issued a statement, May 9, to the effect that the company was not interested in a syndicate which was stated to be negotiating for the control of the Montreal Transportation Co., and we were officially advised that the press reports that A. B. Mackay had secured control of the company were not correct. The facts appear to be that A. B. Mackay obtained an option on the M. T. Co.'s stock, or nearly the whole of

it, and the impression is that he will exercise it. The "prominent Chicago financier" referred to is said to be J. S. Norris, of the Norris Grain Co. A Montreal report mentions Sir Herbert Holt and L. C. Webster, of the Nova Scotia Steel & Coal Co., as being interested.

The Montreal Transportation Co., Ltd., is an old established business, and until 1903, had an authorized capital of \$300,000. In that year the company was reorganized with a capital of \$1,000,000. The paid up capital is about \$913,000, and there are no bonds outstanding. The steamships owned are: Advance, Glenmount, India, Kinmount, Rosemount, Simla, Stormount and Windsor; tugs, Bartlett, D. G. Thomson, Emerson, Glide, H. F. Bronson, M. P. Hall and Mary; lake barges, Augustus, Burma, Dunmore, Hamilton, Hiawatha, Kingston, Lapwing, Melrose, Muskoka, Quebec, Selkirk, Thrush, Ungava, Valencia and Winnipeg. In addition to this, the company owns the entire capital stock of the Prescott Terminal Co., \$500,000. The chief officials are, B. McLennan, President; Farquhar Robertson, Vice President; L. L. Henderson, Managing Director; A. Kingman, A. G. Thomson, H. A. Calvin and A. E. Ogilvie, other directors.

The International Mercantile Marine Co., which has been in the receiver's hands for some time, will, it is reported, pass under the American International Corporation's control shortly. This corporation was formed a few months ago, with an authorized capital of \$50,000,000, with the object of promoting U. S. trade in foreign fields. The Pacific Mail Steamship Co. has been acquired, and it is stated that control of the International Mercantile Marine Co.'s stock has been purchased in the open market.

Cost of Levis Car Ferry.—Hon. Mr. Loughheed stated in the Senate, May 4, that the total cost to date of the car ferry steamship plying between Quebec and Levis, was \$601,231.03. In January it made 62 trips across the river, carrying 904 cars and 9 locomotives, and in February, 63 trips, carrying 883 cars and 2 locomotives. The cost of operation was \$4,839.32 in January, and \$4,828.85 in February. The cost per car for ferriage was \$5.37.

Grain Trade Enquiry.—R. Magill, W. D. Staples and J. P. Jones, of the Dominion Grain Commission, have been appointed by the Dominion Government as a commission to investigate the handling and marketing of grain in Canada, and particularly its grading and weighing, shipment from country elevators, financing and shipment to lake and ocean ports.

The rule established during the war, in Great Britain, that blinds on the windows and doors of railway carriages, must be kept lowered when travelling with lights burning, is being strictly enforced. Several passengers have been fined for infractions recently.

J. S. Dennis, Assistant to President, C. P.R., Calgary, Alta., advised the Lethbridge Board of Trade, recently, that if the Alberta Government decided to erect a school for agriculture in that district, the company would consider making a grant of land for a site.

E. Pope, Superintendent, Dominion Government Telegraphs, Quebec, Que., is reported to be about to place a new multiplex telegraph system on the market. He has been actively engaged in telegraphy since 1855, and has held his present position since 1863.

Grain in Store at Terminal Elevators, Interior Terminal Elevators and at Public Elevators in the East.

Week ending May 12, 1916.	Wheat. bushels.	Oats. bushels.	Barley. bushels.	Flax bushels.	Totals. bushels.
Fort William—					
C.P.R.	1,924,004	403,242	314,453		2,646,699
Consolidated Elevator Co.	726,199	132,565	25,281	131,383	1,015,428
Empire Elevator Co.	1,109,390	323,667	72,640	199,080	1,704,777
Ogilvie Flour Mills Co.	897,961	121,727	40,273		1,059,961
Western Terminal Elevator Co.	542,145	220,017	7,857	197,454	967,473
G. T. Pacific	1,800,468	687,900	166,886	140,061	2,795,315
Grain Growers' Grain Co.	945,755	280,648	24,590		1,250,993
Fort William Elevator Co.	302,740	181,291	65,008	7,035	556,074
Eastern Terminal Elevator Co.	414,757	194,739	26,755		636,251
Port Arthur—					
Port Arthur Elevator Co.	2,292,375	640,377	270,203	129,317	3,332,272
D. Horn & Co.	132,058	58,971	32,046	230,288	453,363
Dominion Government elevator.	1,004,311	347,935	38,341	82,340	1,472,927
Grain afloat.					
Total terminal elevators	12,097,163	3,593,079	1,084,333	1,116,958	17,891,53
Calgary Dom. Govt. Elev.	667,294	411,072	11,854	1,069	1,091,283
Saskatoon Dom. Govt. Elev.	2,135,167	867,787	50,571	141,140	3,194,669
Moose Jaw Dom. Govt. Elev.	2,416,856	271,781	22,771	57,036	2,768,445
Total interior terminal elevators	5,219,317	1,550,640	85,196	199,245	7,054,398
Depot Harbor	477,206				477,206
Midland—					
Aberdeen Elevator Co.	445,873	181,860			627,733
Midland Elevator Co.	765,734	49,870			815,604
Tiffin, G.T.P.	1,422,894	596,018	58,032		2,076,944
Port McNicoll	611,116	746,812		9,985	1,368,513
Collingwood					
Goderich Elevator & Transit Co.	351,716	11,350			362,466
Kingston—					
Montreal Transportation Co.					
Commercial Elevator Co.					
Port Colborne	517,441	182,186	186,318	8,000	893,945
Prescott					
Montreal—					
Harbor Commissioners no. 1	1,185,701	765,725	18,786		1,970,212
Harbor Commissioners no. 2	606,664	1,485,471	23,992	25,332	2,141,459
Montreal Warehousing Co.	829,998	950,248	18,890	32,389	1,831,525
Quebec Harbor Commissioners	638,999	149,448	11,168		799,615
West St. John, N.B.	827,161	260,938	37,094		1,125,193
Halifax, N.S.					
Total public elevators	8,680,503	5,379,926	354,280	75,706	14,490,415
Total quantity in store	25,996,983	10,523,645	1,523,809	1,391,909	39,436,346

Marine Votes for 1916-17.

Marine votes for the fiscal year ending Mar. 31, 1917, recently dealt with by the House of Commons, include the following:

CHARGEABLE TO CAPITAL ACCOUNT.

		Revotes.
Welland Ship Canal.....	\$4,500,000	\$ 500,000
Canals.....		
Lachine.....	30,000	
Rideau.....	40,000	40,000
Trent.....	1,000,000	200,000
	\$1,070,000	\$ 240,000

Harbors and Rivers—		
Halifax dry dock.....	\$ 250,000	\$ 250,000
St. John harbor.....	1,000,000	
Quebec harbor.....	495,000	495,000
Lauzon dry dock.....	1,500,000	
St. Charles River.....	700,000	
Toronto harbor.....	600,000	600,000
French River waterway..	400,000	400,000
Port Arthur and Fort		
William.....	1,000,000	
Vancouver harbor.....	350,000	
Victoria harbor.....	1,000,000	
Esquimalt dry dock.....	200,000	200,000
	\$7,495,000	\$1,945,000

CHARGEABLE TO INCOME ACCOUNT.

Canals.....		
Chambly.....	\$ 5,000	\$ 5,000
Cornwall.....	9,500	9,500
Quebec.....	14,000	
Rideau.....	30,000	
St. Peter's.....	163,000	101,000
Soulanges.....	1,500	900
Trent.....	40,000	
Welland.....	30,000	
Williamsburg.....	2,500	
	\$ 295,500	\$ 116,400

Harbors and Rivers—		
Nova Scotia.....	\$ 736,150	\$ 425,150
Prince Edward Island....	66,400	41,800
New Brunswick.....	425,000	280,000
Maritime Provinces		
generally.....	5,000	5,000
Quebec.....	853,150	468,900
Ontario.....	1,051,800	880,500
Manitoba.....	93,100	65,000
Saskatchewan and		
Alberta.....	29,500	9,500
British Columbia.....	578,000	48,700
Yukon.....	5,000	
General.....	40,000	
Dredging.....	1,730,000	20,000
	\$5,613,100	\$2,244,550

Mail Subsidies—		
Atlantic Ocean.....	\$1,844,167	
Pacific Ocean.....	487,142	
Local services.....	310,625	
	\$2,641,934	

Mail service, authorized by statute		
Canada, China and Japan.....	\$ 121,667	
Canada and France.....	200,000	
	\$ 321,667	

Naval service.....	\$2,250,400	
Ocean and river service.....	1,305,800	
Marine Department.....	2,134,715	
Lighthouse and coast service.....	2,409,700	
Scientific institutions.....	489,713	
Marine hospitals.....	78,000	
Steamboat inspection.....	79,170	
Authorized by statute—		
Collingwood dry dock, No. 1.....	\$ 15,000	
Collingwood dry dock, No. 2.....	9,209	
Montreal floating dock.....	105,000	

Progress on Welland Ship Canal Construction.

J. L. Weller, M.Can.Soc.C.E., Engineer in Charge, Welland Ship Canal, is reported to have said at St. Catharines, May 10, that notwithstanding the war, most satisfactory progress had been made on the four sections under contract, and that three of the sections at least, will be finished within the time limit of four years from the placing of the contract in 1913. The work on sections 1 and 2 is about 50% completed.

Sec. 1 extends from Lake Ontario for about three miles, and includes pier and trestle work at the entrance to the canal, the construction of lock 1, and canal work to bridge 2. The contract was awarded Aug. 1, 1913, and the date for completion set at Apr. 1, 1917. The amount of the contract as based on schedule rates is

\$3,487,727, and the contractors are the Dominion Dredging Co.

Sec. 2 covers the work from bridge 2 to bridge 5, about 4½ miles, including locks 2 and 3. This contract was awarded to Baldry, Yerburch & Hutchinson, Dec. 31, 1913, for completion by Apr. 1, 1917, and the amount based on schedule rates is \$5,377,185.75.

Sec. 3, from bridge 5 to about half way between bridges 9 and 10, covers the heaviest portion of the whole route, and includes the erection of twin guard gates at Thorold, the single lock 7, the construction of a short stretch of canal below lock 7, and also the three twin locks 6, 5 and 4 in flight, one flight for down bound vessels and the other for up bound vessels, overcoming a descent of 139½ ft. The contract was awarded to O'Brien & Doheny, Oct. 4, 1913, for completion by Apr. 1, 1917, and the amount based on schedule rates is \$9,540,050. This work is about 25% completed, and it is not expected that it will be finished on schedule time, but will be at least a year behind time. The work done has been very heavy, in some places rock having been blasted down to 80 ft. Some little labor difficulty has also been experienced, but it is stated that this has now been settled and the laborers, mostly foreign, have all returned to work.

Sec. 5, from just above bridge 12 to just above bridge 13, about 2¾ miles, is reported to be about 50% completed. This contract was awarded to the Canadian Dredging Co., for completion by Apr. 1, 1918, and the amount based on schedule rates is \$1,945,788.

The acting Minister of Railways and Canals has stated that no further contracts will be let this year.

The Venture-Wakena Collision Investigated.

An investigation was held recently at Vancouver, B.C., by Capt. J. D. Macpherson, Wreck Commissioner for British Columbia, assisted by Commander Unwin, R.N.R., and Capt. H. S. Hilton, as nautical assessors, into the collision between the Union Steamship Co. of British Columbia's s.s. Venture, and the Clatskanie Transportation Co.'s s.s. Wakena, from Portland, Ore., in the first narrows of Burrard Inlet, Feb. 26. The evidence produced, was, owing to the fact that witnesses for the Venture alone were present, necessarily one sided. For some unexplained reason after having made all arrangements to be present, the witnesses for the Wakena failed to appear. The evidence adduced was, however, clear and convincing, and the court's opinion was that there can be no doubt that the Wakena's master, in the thick fog then prevailing, lost his bearings when entering the first narrows, and while endeavoring to get his vessel into midchannel, collided with the Venture. No blame can be attached to those in charge of the Venture, the master, John Park, being justified in entering the narrows, though undoubtedly the weather was very thick at the time, not only because he knew where his vessel was, but also because there are very efficient aids to navigation in that locality to meet the requirements of navigation under the conditions then prevailing. The Venture was handled in a proper and seamanlike manner, and the master had verified his position off Prospect Bluff, was going dead slow and sounding his whistle at proper intervals, was as close to the starboard side of the channel as he could be with safety, and

kept an efficient lookout. The court therefore absolved him from all blame. The court surmised that the non appearance of witnesses for the Wakena, implied that they knew they would not be held blameless.

Welland Canal Lock Accident.

On May 2, the wooden steamship W. J. Averell, Capt. Patterson, formerly owned by the Rutland Transit Co., Ogdensburg, N.Y., and now owned by the Canada Shipping Co., Montreal, while upbound to Cleveland with a small cargo of package freight, struck and carried out the two headgates at lock 8 in the Welland Canal. The rush of water from lock 8 level carried the vessel and towpath gate out into the lower reach. The heelpath gate remained near the head gate of the lock, clinging to its anchorage. The level above lock 8 is a short one and the reach below is about 1¼ miles long; consequently very little water overflowed the banks and there was no damage to the latter. The vessel was not damaged. It was necessary to place two spare gates before navigation could be resumed. Locking was resumed in the afternoon, navigation having only been delayed about eight hours. The damage is estimated to be \$3,000, which is said to be fully covered by insurance. The accident was caused by the steel hawser getting caught in the vessel's compressor and it was not even placed on the snubbing post on the lock wall to check her speed. The vessel's engines were reversed too late to avert the collision with the lock gates. We are indebted to L. D. Hara, Superintending Engineer, for these particulars.

Improvements to C. P. R. Great Lakes Steamships.

During the past winter, in addition to the usual overhaul, the steamships Kewatin and Assiniboia, of the C.P.R. Great Lakes fleet, have received a number of improvements. The most important of these is an extension of the upper and promenade decks right to the stern. This provides, abaft the verandah cafe, a roomy, covered in and sheltered space for evening dances. Immediately above, the promenade deck has been extended, giving a clear space of 50 x 36 ft., which, without interfering with the promenade, gives accommodation for quoits, shuffle deck and other shipboard games.

The dining saloons have been entirely remodelled, and have been fitted with a number of small tables to accommodate parties of two to six people. The windows have been enlarged, and now measure 4 ft. wide by 3 ft. deep, with a leaded glass top sash, which provides ventilation without draught. The new windows will provide a good view from any seat in the saloon. The smoking room windows have also been increased in size.

In addition to the original suites de luxe, several rooms have been fitted with connecting shower baths. The main entrance hall has been enlarged, and made adaptable for a quiet smoke or game of cards in the evenings. A new barber shop and news stand have been built off the entrance hall.

The Fort William Grain Co., Ltd., has been incorporated under the Dominion Companies Act, with \$40,000 authorized capital and office at Fort William, Ont., to carry on a general grain dealing business, and to own and operate steam and other vessels, wharves, docks, elevators, etc.

Reported Appeal of Quadra-Charmer Collision Decision.

Subsequent to the judgment on the causes of the collision between the Dominion Government s.s. Quadra and the C.P.R. s.s. Charmer at the entrance to Nanaimo Harbor, B.C., Feb. 26, it was stated that Capt. LeBlanc, master of the s.s. Quadra, had decided to appeal against the decision on the ground that it was opposed to the trend of the evidence. One of the nautical assessors dissented from the judgment rendered. We were officially advised early in May, that the Department of Marine at Ottawa had received no intimation of an appeal, and we were also officially advised that the Wreck Commissioner of British Columbia had not heard anything about an appeal and did not think there would be one.

In writing to the Victoria Times, May 10, regarding the report of an appeal, Capt. J. D. Macpherson, Wreck Commissioner for British Columbia, stated that Capt. LeBlanc, master of the s.s. Quadra, never appealed, never intended to do so, and had nothing to appeal about.

Interviewed by a representative of that paper, the solicitors representing Capt. LeBlanc, are reported to have said that immediately the judgment was made public, they asked the Marine Department at Ottawa for a rehearing before a disinterested and independent tribunal. They also claimed that the finding was not delivered in a legal manner, as it should have been made in open court.

The court dealing with the case consisted of the Wreck Commissioner for British Columbia, Capt. J. D. Macpherson, assisted by Capt. Ridley and Gardner as nautical assessors. The judgment delivered by the Commissioner was concurred in by one of the assessors, the other dissenting. It is being claimed on behalf of Capt. LeBlanc, that the judgment was not legally delivered, as it was not given in open court, and a section of the Canada Shipping Act is quoted, which has no bearing on the present case, as neither the suspension nor the cancellation of the master's certificate was in question, and under the circumstances the delivery of judgment in open court does not appear to be a legal necessity. The Act provides that the Minister of Marine may order a rehearing, "if new and important evidence which could not be produced at the investigation has been discovered, or if for any other reason there has been in his opinion ground for suspecting that a miscarriage of justice has occurred."

In arriving at a decision on such a matter, the Minister would be guided by the evidence submitted, the report of the Commissioner and assessors, and if one of the assessors dissented, his reasons for so doing would be considered with the evidence. In the present case, there seems to be no indication of new and important evidence for a proposed rehearing, and the reasons for Capt. Gardner's dissent chiefly refer to a possible contributory negligence on the part of the s.s. Charmer, while they confirm the wrongdoing of the s.s. Quadra in giving certain signals, which he admits are not international signals, but are the outcome of custom and long usage and recognized by local masters.

Dredging is proceeding in the Lake St. Clair channel, by the U. S. Government, and a loading draught of 19 ft. 5 ins. has been recommended for this year. This is an increase of 5 ins. since the reopening of navigation.

Aid for Shipbuilding in British Columbia.

The British Columbia Legislature is considering a bill to aid the development of the shipbuilding and shipping industries in the province. Two schemes are embodied, one providing for assistance in the building of wooden ships, and the other a bonusing of cargoes taken from B.C. ports for ten years after the conclusion of the war. A commission of three is to be appointed for the administration of the act, one of whom is to be the Minister of Finance, who will be unpaid, the other two being salaried. The scheme for providing financial assistance for shipbuilding covers advances to the extent of 55% of the value of the plant and of whatever ships may be built, and will be for a period to be determined by the commissioners, who will exercise considerable control over the construction and subsequent operations of vessels so built, which will remain under the commissioners' control in the same manner until the loans are repaid in full. The second form of assistance is designed to keep the vessels under the commissioners' control returning to British Columbia, to ensure an outlet for B.C. products. It is proposed to grant a bonus of \$5 a ton for ten years on all cargoes, based on the dead weight, taken from B.C. ports. The administration of the act, when it becomes effective, will be almost solely under the Government control, as practically every act of the commissioners is subject to an order in council.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Canuck Supply Co., Ltd., railway material and supplies, Montreal, has removed from 404 St. James St. to spacious new offices at 418 St. James St.

The Brown Hoisting Machinery Co., Cleveland, Ohio, announces the appointment of its Vice President, Alex. C. Brown, as General Manager, succeeding R. B. Sheridan, who has resigned to accept another position.

Telegraph, Telephone and Cable Matters.

The Dominion Government Telegraph Lines are valued at \$2,411,550, showing a general average of \$244 a pole mile for the whole system.

The Grand Trunk Pacific Telegraph Co. estimates the average cost per mile of telegraph lines on the Lake Superior Division at \$291.22, with two wires to each pole, and on the Prairie Division at \$343 a mile, with four wires to a pole. On its Mountain Division, with two wires to a pole, the average cost per mile was \$606.93. For branch line construction, with an average of 1.12 wires to a pole, the average cost per mile was \$189.27.

The Canadian Northern Telegraph Co., which is now in working agreement with the Great North Western Telegraph Co., in giving figures to the Board of Railway

Commissioners recently, stated that at June 30, 1911, it had 4,440 miles of pole line estimated to be worth \$1,021,200, and 13,550 miles of telegraph wire worth \$273,500, making a total for pole lines and wires of \$1,294,700, which averages \$291 a mile.

The Great North Western Telegraph Co. has opened offices at St. Jean l'Evangeliste, Que.; Beaumaris, Cardinal Canal, Gogoma, Hagersville and Kashbaw, Ont.; Eriksdale, Man.; Errington, Jasper, Lavoy, Stanmore and Tollerton, Alta.; Ashcroft, Blue River, Boston Bat, Chilliwack, Hope, Kamloops Jct., Langley, Lucerne, Lytton, Matsqui, Port Mann, Rosedale and Spences Bridge, B.C. Its offices at Marmora, Ruel and Stackpool, Ont., have been closed.

The C.P.R. telegraph plant was valued recently at \$6,696,421.40, made up as follows: pole line and equipment, \$3,897,238.39; wires, \$2,190,968.37; cables, \$275,044.11; call box system, Toronto, Montreal, etc., 4,865 boxes at \$7, \$34,055; 105 linemen's equipment at \$138.25, \$14,378; 37 gangs' equipments at \$646.49, \$23,920.13; instruments, \$119,149.40; batteries and dynamos, \$50,559; furniture, \$41,109; material in stock, \$50,000. The gross operating revenue of the C.P.R. telegraphs for the financial year ended June 30, 1915, was \$2,504,241.50, and the net operating revenue, \$1,121,734.34, against \$2,991,273.06 and \$1,377,585.42 respectively for the year ended June 30, 1914. The cost of the company's telegraph system is \$6,696,421. The number of messages sent was 3,842,779, received 3,596,07, for the year ended June 30, 1915, against 4,038,505 sent, and 3,694,784 received for the previous year. The company's telegraph system has been constructed, and is being operated, as a part of the railway, although a general commercial telegraph business is conducted.

Among the Express Companies.

C. H. S. Hammond has been appointed agent, Dominion Ex. Co., Weyburn, Sask., vice J. L. Weir, transferred.

B. P. Tretwell has been appointed cashier, Dominion Ex. Co., Windsor, Ont., vice E. Anderson, transferred.

L. I. Watts has been appointed agent, Canadian Northern Ex. Co., Moose Jaw, Sask., vice A. G. Douglas, transferred.

E. Anderson, heretofore cashier, Dominion Ex. Co., Windsor, Ont., has been appointed cashier at Peterborough, Ont.

F. S. Cox, a former employee of the Canadian Northern Ex. Co. at Saskatoon, Sask., has been awarded the distinguished conduct medal for services to the wounded at the front.

The Dominion Ex. Co. has placed its service on the Canadian Government Railways branch from Dartmouth to Upper Musquodoboit, N.S., 69 miles, and has opened offices at Musquodoboit Harbor and Middle and Upper Musquodoboit.

The Board of Railway Commissioners passed order 24976, May 15, requiring the Canadian Express Co. to provide an improved service for freight from the Niagara Peninsula. It is given in full under "Traffic Orders by Board of Railway Commissioners," on an earlier page of this issue.

The Marine and Fisheries Committee reported to the House of Commons, May 4, on the matter of the prices at which fish was sold at various points inland, and made certain recommendations for the widening of the market. Among these, were: the improvement of express

facilities to ensure daily transportation from the east coast in refrigerator cars; improvement of the refrigerator car service so that it may be available on east trains; and the inauguration of an exclusive express service to be operated by the Government over the Canadian Government Railways, as a preliminary of a general scheme for the nationalization of the express business.

Transportation Conventions in 1916.

June 14-17.—Master Car Builders' Association, Atlantic City, N.J.
 June 19-22.—American Railway Master Mechanics' Association, Atlantic City, N.J.
 June 20.—Train Despatchers' Association of America, Toronto, Ont.
 June 20-22.—Association of Railway Telegraph Superintendents, St. Paul, Minn.
 June 20-23.—American Association of Freight Agents, Cincinnati, Ohio.
 June 21.—Train Despatchers' Association of America, Toronto.
 June 21.—American Association of General Baggage Agents, Boston, Mass.
 June 27.—American Society for Testing Materials, Atlantic City, N.J.
 June 27-28.—Association of Transportation and Car Accounting Officers, Boston, Mass.
 June 28.—Association of American Railway Accounting Officers, Detroit, Mich.
 July.—International Railway General Foremen's Association.
 August.—International Railroad Blacksmiths' Association, Chicago, Ill.
 August 29.—International Railway General Foremen's Association, Chicago, Ill.
 Aug. 16 to 18.—American Association of Railroad Superintendents, Memphis, Tenn.
 Sept. 5 to 8.—Traveling Engineers' Association, Chicago, Ill.
 September 12-14.—Master Car and Locomotive Painters' Association of United States and Canada, Wilmington, Del.
 September.—Railway Signal Association, Mackinac Island, Mich.
 September 19-22.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
 October.—Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.

October 3-5.—Railway Fire Protection Association, New York.

October 17-19.—American Railway Bridge and Building Association, New Orleans, La.

October 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Philadelphia, Pa.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated:

Canadian Car Service Bureau—J. Reilly, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.

Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Associations—E. de la Hooke, London, Ont.

Dominion Marine Association—F. King, Counsel, Kingston, Ont.

Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.

Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.

Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.

Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.

International Water Lines Passenger Association—M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee—James Morrison, Montreal.

Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.

Quebec Transportation Club—A. F. Dion, Quebec.

Shipping Federation of Canada—Thos. Robb, Manager, 42 St. Sacrament Street, Montreal.

Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.

Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.

Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.

Western Canada Railway Club—Louis Kon, Box 1707 Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Winnipeg Traffic Club—James Gehrey, Bannatyne Avenue, Winnipeg, Man.

THE CANADA SOUTHERN RAILWAY COMPANY.

The Annual General Meeting of the Shareholders of The Canada Southern Railway Company, for the election of Directors, and other general purposes, will be held at the Company's Head Office in the City of St. Thomas, Ontario, on Wednesday, the 7th day of June, at 11 o'clock in the forenoon.

DWIGHT W. PARDEE,

Secretary.

St. Thomas, Ont., May 8th, 1916.

CANADIAN PACIFIC RAILWAY CO. Dividend Notice.

At a meeting of the Board of Directors, held to-day, a dividend of two and one-half per cent. on the Common Stock for the quarter ended 31st March last, being at the rate of seven per cent. per annum, and three per cent. per annum from Special Income Account, was declared payable on 30th June next to Shareholders of record at 3 p.m. on 1st June next.

By order of the Board,

W. R. BAKER,

Secretary.

Montreal, 8th May, 1916.

NIAGARA TO THE SEA



A Magic Chain of Delightful Scenes

Makes this famous 800 mile trip through America's greatest, and most interesting Waterway the Vacation Trip without parallel.

The service on our palatial steamers is unexcelled. The Falls of Niagara, the Thousand Islands, the Rapids of St. Lawrence, quaint old Quebec, Murray Bay, Tadousac and the Saguenay—all these attractions combine to make an ideal vacation trip.

The Saguenay River with its wealth of scenic beauties—its exhilarating atmosphere—is a never-ending source of enjoyment. Shorter trips at proportionate rates.

WRITE for our beautifully illustrated booklet "Niagara to the Sea". It tells about a vacation trip every minute of which you will enjoy. Enclose 6c. to cover postage.

5-Day Tour to Montreal and return including meals and Berth **\$25.**

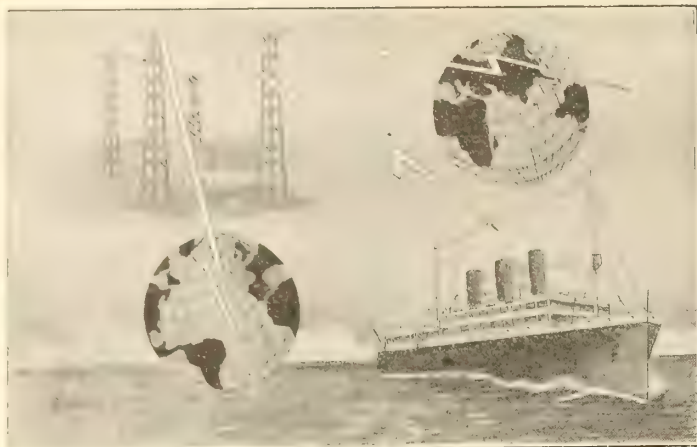
6-Day Tour to Quebec and return including meals and Berth **\$34.**

8-Day Tour to Chicoutimi and return including meals and Berth **\$47.**

15-Day Tour to Nova Scotia and return including meals and Berth **\$87.65**

Canada Steamship Lines, Limited

46 Yonge St., TORONTO
 R. & O. Bldg., MONTREAL
 or any Ticket Agent.



OF THE WORLD'S WIRELESS
STATIONS 80% ARE ON THE MARCONI SYSTEM.

LET US SUBMIT SUGGESTIONS !

Marconi Wireless Telegraph Apparatus

MADE IN CANADA.

Wireless equipment of all kinds supplied: Land, ship, railway and aeroplane sets with ranges of from 50 to 2,000 miles.

Have you considered the advantages of connecting up factory or mine to head office by wireless telegraphy?

SHIP SETS—Suitable for liners, yachts, tugs and freight boats and scows—our specialty.

Our stations may be hired or bought outright.

The Marconi Wireless Telegraph
Company of Canada, Limited

Shaughnessy Building, MONTREAL

Dominion Iron & Wrecking Company LIMITED

Railway Equipment, Rails and Machinery

Dismantlers of BRIDGES, PLANTS, STEAMERS, MILLS
Dealers in IRON, STEEL, SCRAP METALS

General Offices: Transportation Building
TORONTO

QUEBEC

MONTREAL, QUE.
ST. JOHN, N.B.

Car Ventilation

Expert Advice is as needful in this as in other matters of Car Construction. Is not the experience of twelve years, devoted exclusively to this field, worth anything to you? We have it, and it is yours for the asking.

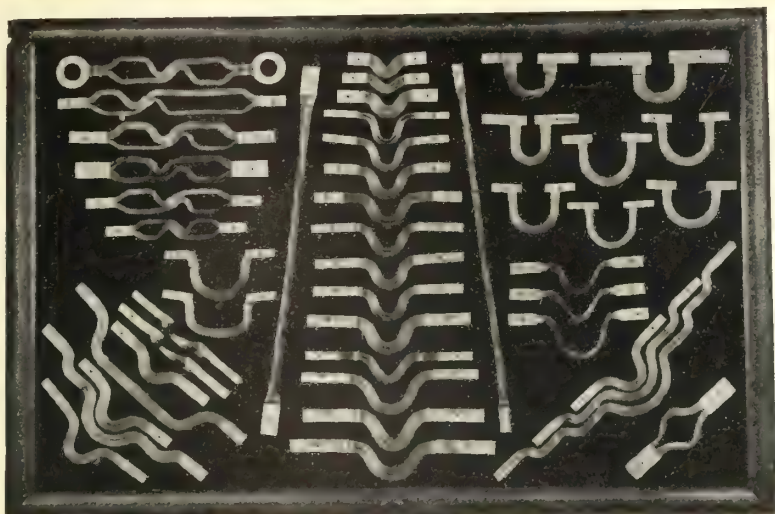
CAR VENTILATORS of all types at prices from \$1.50 up.

For information address

Automatic Ventilator Company

No. 2 Rector Street

New York, N.Y.



Electric Weld Rail Bonds

meet every condition.

Neither do they corrode at the terminals.

The Electric Railway Improvement Co.

Cleveland, Ohio

Columbia Batteries

The Versatile Power Units

These little energy producers are indeed versatile. They can be used for any one of a multitude of different uses with the assurance of satisfactory operation in each instance. Use them in telephone and telegraph service, train dispatching, signals, etc.

For steady, sure operation of bells and annunciators they are ideal. Splendidly adapted as a source of energy for the lighting of battery operated lamps and lanterns.

As a source of ignition current of gasoline engines they are unapproachable. In fact for every battery-use it will pay to specify the famous

Columbia Batteries. Cost no more—Last longer.

Write for Catalog.

Canadian National Carbon Co., Limited

99 Paton Road, Toronto, Ont.

Manufacturers of Columbia Track and Signal Cells, Helios Storage Batteries, Carbon Brushes, Lighting Carbons and manufactured carbon in every form.



Are You in the Market for Trolley Catchers, Retrievers, Bases or Head Lights

We manufacture Knutson No. 5 Trolley Retriever, Knutson No. 2 Trolley Retriever, The Ideal Trolley Catcher, The Simplex Trolley Base, The Peerless No. 10 Roller-bearing Trolley Base, The Peerless Check Valve, The Peerless Junior Head Light, The Perfect Head Light, The Hollis Safety Fender, No. 3 Detachable Fender.

Write our Canadian Representatives Allen General Supplies, Limited they will be pleased to give you complete information as to any of the above as well as our other lines.

Trolley Supply Company, Canton, Ohio

Address all correspondence to Allen General Supplies, Limited, 205 Yonge St., Toronto



Minarets and Mountain Peaks

at luxurious Banff—in the very heart of the

Canadian Pacific Rockies

At Banff are all the fine touches of social life, good table, good service, every possible comfort at moderate cost. From the stone pillared verandah or from the wide windows of the hotel, lies spread the great panorama of Alps and river.

Reached only by the world's greatest transportation system—the

Canadian Pacific Railway

which maintains hotels at Banff, Lake Louise, Field, Glacier, Balfour.

Everything Canadian Pacific Standard—None Better.

For further information apply to any Canadian Pacific Ticket Agent or W. B. Howard, District Passenger Agent, Toronto.



Rails, Cars, Locomotives

and Contractors' Equipment

IMMEDIATE
SHIPMENT

John J. Gartshore

58 Front St. West
TORONTO

The Ottawa Car

Manufacturing Co., Limited

Builders of

Electric Cars, Snow
Sweepers and Plows

Also

Producers of Brass
Castings of Every
Description.

Slater Street - Ottawa

ENAMELED IRON SIGNS

The ideal signs for
Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.

We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc,

Guaranteed not to
fade or be affected
by the weather in
any way.

Acton Burrows
Limited

Enameled Iron Signs

70 Bond Street - Toronto



Copyrighted by International News Service.

Why?

A defective signal wire might easily cause just such an awful wreck as this.

Why take the chance?

To safeguard your road against such catastrophes you should not only have the best signalling equipment but you must use

Northern Electric Railway Signal Wire

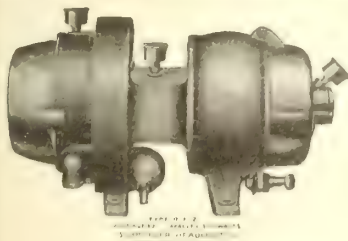
No conditions impose a severer test on wire than those used in connection with a railroad signalling system.

Northern Electric R.S.A. wire meets the R.S.A. specifications in every particular and goes a step further—it meets the more rigid Northern Electric specifications which gives you, the user, double protection.

Buy your wire and cable from the largest makers in Canada.

Northern Electric Company LIMITED

MONTREAL HALIFAX TORONTO WINNIPEG
REGINA CALGARY VANCOUVER



70 Schroeder Incandescent Headlights

In Service
270 days without any expense for repairs.
As a result of this exceptional service
150 more have just been ordered.

The HIRAM L. PIPER CO., Limited

MONTREAL, Sole Agents for Canada

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. BABBITTS. Miscellaneous Brass Castings for Railroads.
Works and Office: 69 Delorimier Avenue, MONTREAL, QUE.



You Can Bridge This Gulf

In life there is a gulf. On one side live the untrained who work for small wages in jobs that thousands can fill. On the other side live those men who have trained themselves in skilled trades or professions which bring them independence and good salaries.

On which side of the gulf are you? If you are on the wrong side, you don't have to stay there. The International Correspondence Schools have helped tens of thousands of men to travel over to the right side on the bridge called "training." This bridge is open to you.

All you have to do now is to use this coupon. In return the I. C. S. will explain how they can help you to prepare, without losing a minute's time from your work, for a position of real earning power.

Wherever you live, whatever you do, no matter how limited your education, the I. C. S. can fit you for the position you want, in the work you like best. Mark and mail the coupon now.

I. C. S., Box 8405, Scranton, Pa.

TEAR OUT HERE International Correspondence Schools Box 8405, SCRANTON, PA.

Explain, without obligation, how I can qualify for the position, or in the subject, before which I mark X.

- | | |
|---|---|
| <input type="checkbox"/> Locomotive Engineer | <input type="checkbox"/> R. R. Agency Accounting |
| <input type="checkbox"/> Locomotive Fireman | <input type="checkbox"/> R. R. Gen'l Office Acct'g |
| <input type="checkbox"/> Traveling Engineer | <input type="checkbox"/> Bookkeeper |
| <input type="checkbox"/> Traveling Fireman | <input type="checkbox"/> Stenographer and Typist |
| <input type="checkbox"/> Air Brake Inspector | <input type="checkbox"/> Higher Accounting |
| <input type="checkbox"/> Air Brake Repairman | <input type="checkbox"/> Mathematics |
| <input type="checkbox"/> Round House Foreman | <input type="checkbox"/> Good English |
| <input type="checkbox"/> Trainmen and Carmen | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> Railway Conductor | <input type="checkbox"/> Advertising Man |
| <input type="checkbox"/> Mechanical Engineer | <input type="checkbox"/> Civil Service |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> Railway Mail Clerk |
| <input type="checkbox"/> Machine Shop Practice | <input type="checkbox"/> Electrical Engineer |
| <input type="checkbox"/> Boiler Maker or Designer | <input type="checkbox"/> Electrician |
| <input type="checkbox"/> Steam Engineer | <input type="checkbox"/> Electric Wiring |
| <input type="checkbox"/> Steam Electric Engineer | <input type="checkbox"/> Electric Lighting |
| <input type="checkbox"/> Civil Engineer | <input type="checkbox"/> Telegraph Expert |
| <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> Mine Foreman or Engineer |
| <input type="checkbox"/> R. R. Constructing | <input type="checkbox"/> Metallurgist or Prospector |
| <input type="checkbox"/> Bridge Engineer | <input type="checkbox"/> Chemical Engineer |
| <input type="checkbox"/> Architect | <input type="checkbox"/> Agriculture |
| <input type="checkbox"/> Architectural Draftsman | <input type="checkbox"/> Poultry Raising |
| <input type="checkbox"/> Contractor and Builder | <input type="checkbox"/> Automobiles |
| <input type="checkbox"/> Structural Engineer | <input type="checkbox"/> Auto Repairing |

Name _____

Occupation
or Employer _____

Street
and No. _____

City _____

State _____

Dominion Bridge Company, Limited

Head Office and Works,
MONTREAL, P.Q.

Branch Offices and Works,
TORONTO, OTTAWA and WINNIPEG



Lachine Bridge

Engineers, Manufacturers and Erectors of Steel Structures.
CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

Large Stock of Standard Structural Material at all Works.



Showing the construction of our geared jacks.

Celebrated "H & E" Lifting Jack

Our Patent Ball-Bearing Geared Jacks are Ideal in Railroad and Heavy Construction Work.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

SHERBROOKE, QUE.

Sole Agents for Brakeshoes for Canada outside of B.C., Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for B.C., The B.C. Equipment Co., Vancouver, B.C. Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.

High Grade Electric
STEEL CASTINGS
MANGANESE STEEL
For Crusher Jaws and Heavy Wear Parts

BRONZE
M.C.B. Standard Journal Bearings and Engine Bearings

Improved Reinforced Steel-Backed
BRAKESHOES
Locomotive Driver and Truck Shoes. Freight and Passenger Car and Electric Car Shoes.

STANDARD

Colonial Copper Clad Wire

TRADE **C.C.C.** MARK

has satisfactorily met the requirements of large and discriminating buyers for many years. Its economy in installation and maintenance has therefore been proven by years of exacting service tests. There may be many places in your electric systems where C. C. C. Wire can be economically employed.

For further information write our nearest office for new C. C. C. Bulletin No. 202.

Standard Underground Cable Co. of Canada, Limited

General Offices & Works:
Hamilton, Ont.

Montreal, Que.
Hamilton, Ont.

Winnipeg, Man.
Seattle, Wash.

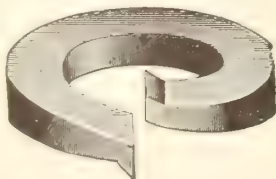
The Preston Car & Coach Co., Limited

Preston, Ont.

Manufacturers of
Steam and Electric
Railway Cars and
Special Cars.

The Positive Lock Washer

is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks

The Positive Lock Washer Co.
Sole Mfrs., Newark, N.J.

F. H. HOPKINS & CO., Agents, Montreal



Capital Authorized \$10,000,000
Capital Paid up 7,000,000
Reserve Fund 7,000,000

Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the World.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.

Insist on having

DREWRY'S American STYLE RICE BEER

The best beer—
without exception

E. L. Drewry, Ltd., Winnipeg

"STERLING" Hack Saws



Sterling
HIGH SPEED POWER SAW

A Combination that will save money for you.

Manufactured by

Diamond Saw & Stamping Works,
Buffalo, N.Y., U.S.A.



Which Method

prevails in your plant? Does it take two men to do one man's work.

Why don't you replace that old antiquated tool with a new up to date

Reece's New Screw Plate

These pictures do not exaggerate conditions as you can actually see them, if you will visit Machine Shops throughout the country.

Lessen your cost by giving your mechanics a REECE'S NEW SCREW PLATE.

Butterfield & Co., Inc.
Rock Island, Que.

ESTABLISHED 1849.

BRADSTREET'S

Capital and Surplus, \$1,500,000.
Offices throughout the Civilized World.

Executive Offices:
NOS. 346 and 348 BROADWAY,
N.Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA:

Halifax, N.S.; Hamilton, Ont.; London, Ont.;
Montreal, Que.; Ottawa, Ont.; Quebec, Que.;
St. John N.B.; Toronto, Ont.; Vancouver, B.C.;
Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.;
Victoria, B.C.

THOS. C. IRVING,
Gen. Man. Western Canada, Toronto.

John Morrow Screw & Nut Co., Limited.

BUSINESS AS USUAL

Set Screws
Cap Screws
Nuts, every variety
of finish
Twist Drills, etc.

Customers are requested to place their specifications with us as far ahead of their actual needs as possible so that we may give them good service.

INGERSOLL - ONTARIO

Consolidated

600 volt—Switches—1800 volt

ARE
MECHANICALLY AND ELECTRICALLY
CORRECT

Write us for further information.

Consolidated Car-Heating Co.

New York — Albany — Chicago

DAWSON & CO., AGENTS
148 McGill Street, MONTREAL, QUEBEC.

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Celebrated Wheel Truing Brake Shoe.
Best Wheel Grinders in the World.

"BEATTY" HOISTS

For situation where the work is severe and the service exacting—"a Beatty always fills the bill"



Derrick car engined with an 8 x 12 four drum Beatty Hoist placing an 80 foot deck plate girder span in Skugog River Bridge.

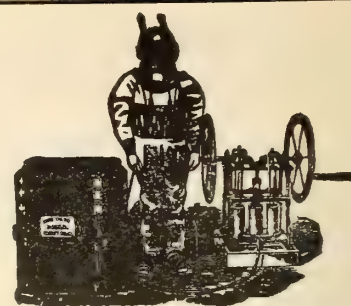
Let us know your requirements for
Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell
Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

We will gladly send full information.

M. Beatty & Sons Limited - Welland

Toronto Office—Goodyear Bldg. Telephone Adelaide 208.

Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg, Winnipeg.



JOHN DATE

Manufacturer of

Diving Apparatus

For Sale or Hire

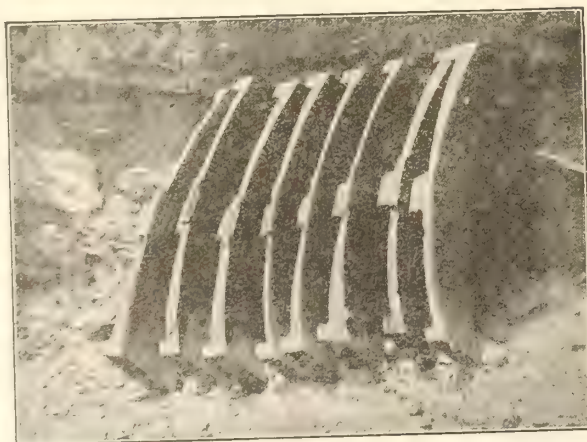
Brass Founder and Coppersmith
13-15 Concord St., Montreal

Electric Railway Supplies

Detroit Controller Checks.
Peerless Check Valves.
Hollis Safety Fender.
Bakalite Arch-leaves, Brush holders
Yokes and Rods.
Bakalite Washers and Asbestos
Board.
Gongs, Bells and Air Whistles.

Allen General Supplies, Ltd.
205 Yonge Street Toronto

Reinforced Brake Shoes



wear as shown above, before they are scrapped and they wear safely, too. You get your full money's worth in satisfactory service from them always.

Reinforced Car, Coach and Driver Shoes are absolutely essential for safe and economical operation in all classes of railway service.

Manufactured in Canada.

Dominion Brake Shoe Company, Limited

350-356 St. James Street, Montreal.

The Holden Co., Limited, Agents

Car Closets

Flush or Dry

DUNER CO. 101 S. CLINTON ST.
CHICAGO

TORONTO, HAMILTON AND BUFFALO RAILWAY COMPANY.

NOTICE IS HEREBY GIVEN that the Annual General Meeting of the Shareholders of this Company, for the election of a Board of Directors, and for the transaction of such other business as may be brought before meeting, will be held at the office of the Company, in the city of Hamilton, Province of Ontario, on Tuesday, June 6th, 1916, at 11 o'clock in the forenoon.

DWIGHT W. PARDEE,
Secretary.

Hamilton, Ont., May 6th, 1916.

THE VICTORIA ROLLING STOCK AND REALTY CO. OF ONTARIO, LTD.

NOTICE is hereby given that a dividend of 4% on the paid-up capital stock of the Company for the six months ended May 31st, 1916, has been declared payable June 1st, 1916, to the shareholders of record as of the 31st of May, 1916.

By order of the Board,
G. T. CHISHOLM, Secretary.
Toronto, May 8th, 1916.

Engineers and Contractors**ANGUS SINCLAIR, C.E.***Railway Contractor*Office: Imperial Bank Building,
King and Sherbourne Sts., Toronto.**Locomotive COALING STATIONS****ROBERTS AND SCHAEFER CO.**ENGINEERS AND CONTRACTORS
CHICAGO U.S.A.Edward F. Terry
PresidentFrederick Tench
V. P. & Treas.**The TERRY & TENCH CO., Inc.***Bridge Builders*General Contractors, Engineers and Designers
Grand Central Terminal NEW YORK**JACOBS & DAVIES, Inc.**
Consulting Engineers

MONTREAL LONDON NEW YORK

Foundations, Subaqueous and Land Tunnels, Subways, Railways, Harbours, Waterpower Development, Examinations, Reports.

Montreal Office: Eastern Townships Bank Building

THE ARNOLD COMPANYENGINEERS—CONSTRUCTORS.
ELECTRICAL—CIVIL—MECHANICALREPORTS, DESIGN AND CONSTRUCTION
Complete Railway Shop and Terminal Properties—
Electrification of Steam Railroads.
OUR EXPERIENCE COVERS THIRTY-FIVE PLANTS
Chicago, Illinois.**Patent Solicitors****PATENTS**

HERBERT J. S. DENNISON

Mechanical Engineer, Patent Attorney and Expert.
Patents, Trade Marks, Designs, Copyrights, and
Infringements. 20 Years experience in Patents
and Practical Engineering.Star Building, 18 King Street West, Toronto
WRITE FOR BOOKLET.**PATENTS SECURED OR OUR FEES RETURNED.**

Being next door to the Patent Office; we have personal interviews with Examiners, thus earlier allowance of your Patents. We have access to all Records and solicit the business of Manufacturers, Engineers and others who realize the advisability of having their Patent business transacted by Experts.

HAROLD C. SHIPMAN & CO.

Reg. Patent Attorneys. Ottawa, Canada

VAN-HALLEN & O'NEAIL

REGISTERED ATTORNEYS

at Washington and Solicitors of Canadian and Foreign Patents, Copyrights, Trade Marks, Searches.

Head Office, 103 Farmer Building, 333 Main Street.
WINNIPEG, MAN., Canada**FOR TICKET CASES AND COMMERCIAL FURNITURE**of all descriptions to stock
or special design, apply toThe Canadian Office and School Furniture Co.
Limited

Preston - Ontario

Hunt-Spiller Gun Iron

IN

Locomotive Castings

SAVES MONEY

INCREASES: Engine Efficiency—Engine Mileage.

DECREASES: Engine Failures—Engine Repairs.

MADE ONLY BY

Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.J. G. Platt,
Sales Manager.Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.ROBERT W. HUNT
THOS. C. IRVING, JR.CHARLES WARNOCK
JAS. W. MOFFAT**Robert W. Hunt & Co., Limited****Consulting and Inspecting Engineers
Chemists and Metallurgists**Expert examination and tests of all steel and metal products;
Bridges, Buildings, Cement; Electrical and Mechanical Plant
Equipment; Rails and Fastenings; Cars; Locomotives; Pipe;
Castings; Forgings; Lumber; Paving Materials.Resident inspectors at all important manufacturing centres in
Canada, the United States and Great Britain.

REPORTS ON PROPERTIES AND PROCESSES.

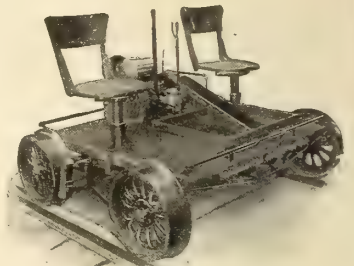
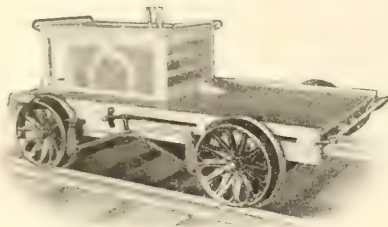
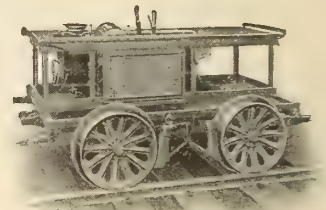
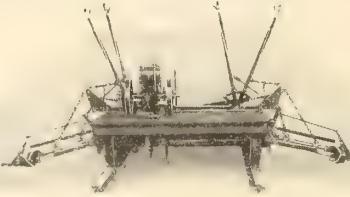
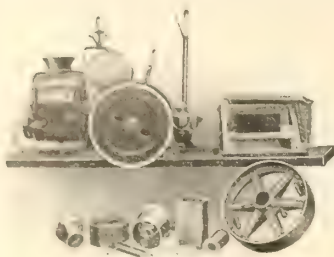
Head Office and Laboratories:

McGill Building, - - - MONTREAL, QUE.

Branches: TORONTO VANCOUVER LONDON, ENGLAND

Complete Hydraulic Equipment**For Railway and Shipbuilding Plants**Wheel Presses, Keel Plate Bending Presses, Riveters, Shears,
Presses, etc. Centrifugal Pumps, Pumping Engines, Gas Plants, Gas
Power Plants, Cast Iron Pipe, Hydrants, Valves and Fittings, etc.**R. D. WOOD & CO. Philadelphia, Pa.**

FAIRMONT WINS GOLD MEDAL



The excellence of FAIRMONT Railway Motor Cars is attested by their receiving the highest competitive award, a gold medal, at the Panama-Pacific International Exposition, San Francisco.

Years of good service on Canadian railroads has proven the justice of this award. When you need a motor car, specify "FAIRMONT". Instalment terms to private buyers.

FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

Formerly Fairmont Machine Co.

445 N. MAIN ST., FAIRMONT, MINNESOTA, U.S.A.

KINNEAR

STEEL ROLLING DOORS & SHUTTERS
BI-FOLDING & SLIDING DOORS
APPROVED FIRE DOORS

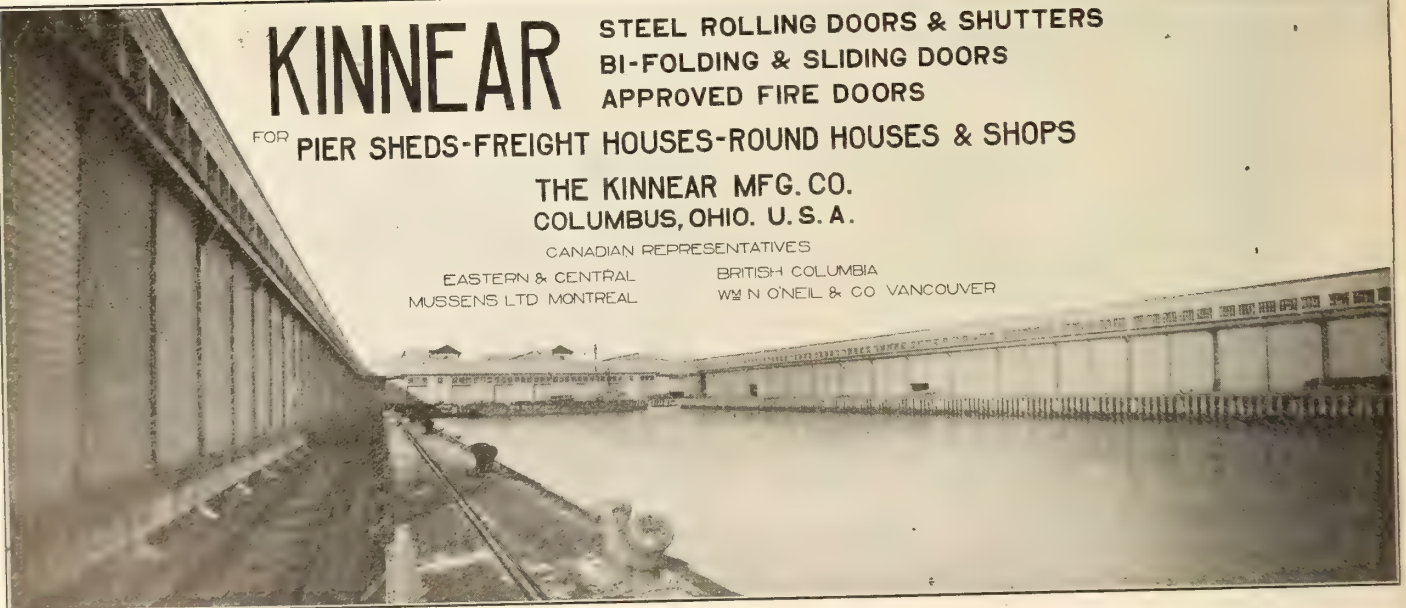
FOR PIER SHEDS-FREIGHT HOUSES-ROUND HOUSES & SHOPS

THE KINNEAR MFG. CO.
COLUMBUS, OHIO. U. S. A.

CANADIAN REPRESENTATIVES

EASTERN & CENTRAL
MUSSENS LTD MONTREAL

BRITISH COLUMBIA
W. N. O'NEIL & CO VANCOUVER



NICKEL

Shot—High and low carbon.

Ingots—Two sizes, 25 lbs., 50 lbs.

Electrolytic Nickel—99.80 p.c.

Prime Metals for the Manufacture of Nickel Steel, German Silver, Anodes and all remelting purposes. Our Nickel is produced as Rods, Sheets, Strip Stock, Wire and Tubes.

We are **SOLE PRODUCERS** of this natural stronger-than-steel, non-corrodible alloy. Manufactured forms are Rods, Flats, Castings, Tubes, Sheets, Strip Stock and Wire.

Send Inquiries Direct to Us.

The International Nickel Co., 43 Exchange Place, N.Y.



MONEL
METAL

It Pays to carry an advertisement in the Canadian Railway and Marine World every issue of the year because you obtain proportionately better **Results**

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies.

- ACETYLENE**
Commercial Acetylene Ry., Lt. & Sig. Co.
- AERATED WATERS**
E. L. Drewry
- AIR BRAKES AND FITTINGS**
Canadian Westinghouse Co.
- ALES**
E. L. Drewry
- ANGLE BARS**
Steel Co. of Canada
- AUTOMOBILES**
Preston Car & Coach Co.
- AXLES**
Nova Scotia Steel and Coal Co.
Jas. W. Pyke & Co.
Steel Co. of Canada.
- BATTERIES, DRY**
Canadian National Carbon Co.
- BATTERIES, SIGNAL**
Canadian National Carbon Co.
- BATTERIES, STORAGE**
Canadian National Carbon Co.
- BATTERIES, TRACK**
Canadian National Carbon Co.
- BATTERY SUPPLIES**
Canadian National Carbon Co.
- BOILER COMPOUND**
Dearborn Chemical Co. of Canada
- BOILERS**
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works
- BOILERS, PORTABLE**
F. H. Hopkins & Co.
Polson Iron Works
- BOILERS, STATIONARY AND MARINE**
Polson Iron Works
- BOILERS, STEAM**
Polson Iron Works
- BOILERS, WATER TUBE**
Babcock & Wilcox
Polson Iron Works
- BOLTS AND NUTS**
Steel Co. of Canada
- BOLTS, TRACK**
F. H. Hopkins & Co.
Nova Scotia Steel & Coal Co.
Steel Co. of Canada
- BORERS, CAR WHEEL**
John Bertram & Sons Co.
Canada Machinery Corporation
- BRAKE BEAMS**
Buffalo Brake Beam Co.
- BRAKE SHOES**
Canada Iron Foundries
Canadian Brakeshoe Co.
Dominion Brakeshoe Co.
- BRAKE SHOES, LOCOMOTIVE DRIVER**
Canada Iron Foundries
- BRIDGE BUILDERS**
Terry & Tench Co.
- BRIDGE NUMBERS**
Acton Burrows, Limited
- BRIDGES**
Canadian Bridge Co.
Dominion Bridge Co.
- BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION**
Canadian National Carbon Co.
- BUCKETS, COAL, ORE AND CONCRETE**
M. Beatty & Sons
Brown Hoisting Machinery Co.
F. H. Hopkins & Co.
- BUILDINGS, STEEL**
Canadian Bridge Co.
Dominion Bridge Co.
- BUMPING POSTS**
F. H. Hopkins & Co.
- CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED**
Standard Und. Cable Co. of Can.
- CARBONS, ARC LAMP, FLARE ARC AND PHOTOGRAPHIC**
Canadian National Carbon Co.
- CARBON SPECIALTIES**
Canadian National Carbon Co.
- CAR CLEANER**
Allen General Supplies, Ltd.
- CAR SIGNAL SYSTEMS**
Ohio Brass Co.
- CARS**
Crossen Car Co.
Hart-Otis Car Co.
National Steel Car Co.
Ottawa Car Mfg. Co.
Preston Car & Coach Co.
- CASTINGS**
Crossen Car Co.
- CASTINGS, BRASS**
Canada Iron Foundries
Canadian Bronze, Limited
- CASTINGS, CAR**
Canada Iron Foundries
Dominion Brakeshoe Co.
- CASTINGS, IRON**
Canada Iron Foundries
Hunt-Spiller Manufacturing Corp.
- CASTINGS, IRON AND STEEL**
Dominion Brakeshoe Co.
Dominion Steel Foundry Co.
- CASTINGS, MALLEABLE**
Taylor & Arnold
- CASTINGS, MANGANESE STEEL**
Canadian Steel Foundries, Ltd.
- CASTINGS, STEEL**
Dominion Steel Foundry
- CATENARY MATERIALS**
Ohio Brass Co.
- CHAINS**
B. J. Coghlin Co.
F. H. Hopkins & Co.
- CLOSETS, CAR**
Duner Co.
- COAL**
Nova Scotia Steel and Coal Co.
- COAL CHUTES**
Roberts & Schaefer Co.
- COAL DOCK BRIDGES**
Roberts & Schaefer Co.
- COAL MINING AND WASHING PLANTS**
Roberts & Schaefer Co.
- COALING STATIONS**
Roberts & Schaefer Co.
- COMPRESSORS, AIR**
F. H. Hopkins & Co.
- CONCRETE MIXERS & ROCK CRUSHERS**
F. H. Hopkins & Co.
- CONTRACTORS' SUPPLIES**
F. H. Hopkins & Co.
Rice Lewis & Sons
- CONVEYORS, COAL AND ASH**
Babcock & Wilcox
- COPPER, RODS AND WIRE**
Standard Und. Cable Co. of Can.
- COUPLERS, CAR & LOCOMOTIVE**
Canadian Steel Foundries, Ltd.
Ohio Brass Co.
Taylor & Arnold
- CRANES**
Brown Hoisting Machinery Co.
F. H. Hopkins & Co.
- CRANES, WRECKING**
F. H. Hopkins & Co.
- CRANES, ELECTRIC**
Babcock & Wilcox
Dominion Bridge Co.
F. H. Hopkins & Co.
- CRANES, TRAVELLING**
F. H. Hopkins & Co.
- CROWBARS**
B. J. Coghlin Co.
- CULVERTS**
Pedlar People, Ltd.
- CURTAINS AND FIXTURES, CAR**
Du Pont Fabrikoid Co.
Preston Car & Coach Co.
- CUTS**
Acton Burrows, Limited
- DERIVINGS**
M. Beatty & Sons
F. H. Hopkins & Co.
- DIES**
Butterfield & Co.
- DITCHERS**
M. Beatty & Sons
F. H. Hopkins & Co.
- DIVING OUTFITS**
John Date
F. H. Hopkins & Co.
- DOORS, STEEL ROLLING**
Kinnear Manufacturing Co.
- DOOR SIGNS**
Acton Burrows, Limited
- DRAFT GEAR**
Standard Coupler Co.
- DREDGES**
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works
- DRILLS**
John Morrow Screw & Nut Co.
- DRILLS, AIR**
F. H. Hopkins & Co.
Independent Pneumatic Tool Co.
- DRILLS, RADIAL**
Canada Machinery Corporation
- DRILLS, VERTICAL**
Canada Machinery Corporation
- DRILLS, WELL**
F. H. Hopkins & Co.
- DUMP CARS, CONTRACTORS'**
Hart-Otis Can. Co.
F. H. Hopkins & Co.
- DYNAMO AND ELECTRIC CASTINGS**
Dominion Brakeshoe Co.
- ECONOMIZERS**
Babcock & Wilcox
- ELECTRIC CAR ROUTE SIGNS**
Acton Burrows, Limited
Preston Car & Coach Co.
- ENAMELED IRON SIGNS**
Acton Burrows, Limited
- ENGINEERS**
Arnold Co.
Jacobs & Davies
Roberts & Schaefer Co.
Angus Sinclair & Co.
- ENGINES, AUTOMATIC**
Polson Iron Works
- ENGINES, HOISTING**
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works
- ENGINES, STATIONARY AND MARINE**
Polson Iron Works
- ENGINES, STEAM**
F. H. Hopkins & Co.
- EXPRESS OFFICE SIGNS**
Acton Burrows, Limited
- FARE BOX HOLDERS**
Coleman Fare Box Co.
- FARE BOXES, P.A.Y.E. OPERATION**
Coleman Fare Box Co.
- FARE BOXES, PORTABLE AND STATIONARY**
Coleman Fare Box Co.
- FILES**
Nicholson File Co.
- FORGINGS**
Crossen Car Co.
Nova Scotia Steel & Coal Co.
Steel Co. of Canada
- GAUGE COCKS**
Ohio Brass Co.
- GAUGES, LOCOMOTIVE**
Taylor & Arnold
- GEARS AND PINIONS**
Allen General Supplies, Ltd.
- GRATES, SHAKING**
Babcock & Wilcox
Polson Iron Works
- HAMMERS, CAST STEEL**
Dominion Brakeshoe Co.
- HANDCARS**
F. H. Hopkins & Co.
Crossen Car Co.
F. H. Hopkins & Co.
Rice Lewis & Sons
- HANGERS, CABLE**
Standard Und. Cable Co. of Can.
- HEADLIGHTS**
Commercial Acetylene Ry. Lt. and Sig. Co.
Ohio Brass Co.
- HEADLININGS**
Crossen Car Co.
- HEATING, CAR**
Chicago Car Heating Co.
Consolidated Car Heating Co.
- HOISTS, PNEUMATIC**
Taylor & Arnold
- HOISTS, STEAM**
M. Beatty & Sons
- HOOKS**
Steel Co. of Canada
- HOPPERS, CAR, WET OR DRY**
Duner Co.
- ILLUSTRATIONS**
Acton Burrows, Limited
- INSPECTIONS**
R. W. Hunt & Co.
- INSULATORS, PORCELAIN**
Ohio Brass Co.
- INSURANCE, ACCIDENT**
Imperial Guar. & Acc. Ins. Co.
- INTERLOCKING PLANT AND SIGNALS**
Canadian Steel Foundries, Ltd.
Gen. Railway Signal Co. of Can.
- IRON AND STEEL BARS**
Steel Co. of Canada
- IRON SIGNS**
Acton Burrows, Limited
- IRON, PIG**
Nova Scotia Steel and Coal Co.
Steel Co. of Can.
- JACKS**
Canadian Brakeshoe Co.
Canadian Steel Foundries, Ltd.
F. H. Hopkins & Co.
A. O. Norton, Limited
- JOURNAL BEARINGS**
Canadian Bronze, Limited
Crossen Car Co.
Jas. W. Pyke & Co.
- LAGGING AND COVERING, LOCOMOTIVE**
Taylor & Arnold
- LAGER BEER, ETC.**
E. L. Drewry
- LAMPS AND LANTERNS**
F. H. Hopkins & Co.
The Hiram L. Piper Co.
- LAMPS, GAS**
Commercial Acetylene Ry. Lt. and Sig. Co.
- LAMPS, INCANDESCENT**
Canadian Westinghouse Co.
- LATHES**
John Bertram & Sons Co.
Canada Machinery Corporation
- LIGHTING, CAR**
Commercial Acetylene Ry. Lt. and Sig. Co.
- LIGHTING, SIGNAL**
Commercial Acetylene Ry. Lt. and Sig. Co.
- LIGHTS, CONTRACTORS' AND WRECKING**
F. H. Hopkins & Co.
- LINE MATERIAL**
Ohio Brass Co.
- LOCOMOTIVES, CONTRACTORS'**
Canadian Locomotive Co.
Montreal Locomotive Works
F. H. Hopkins & Co.
- LOCOMOTIVES, ELECTRIC**
Montreal Locomotive Works
- LOCOMOTIVES, LOGGING**
Canadian Locomotive Co.
F. H. Hopkins & Co.
Montreal Locomotive Works
- LOCOMOTIVES, RACK**
Canadian Locomotive Co.
- LOCOMOTIVES, STEAM**
Canadian Locomotive Co.
F. H. Hopkins & Co.
Montreal Locomotive Works
- LORRIES, TRACKLAYING**
Crossen Car Co.
F. H. Hopkins & Co.
- LUBRICATORS**
Canadian Detroit Lubricator Co.
Taylor & Arnold
- MACHINES AND PLANT, CONTRACTORS'**
M. Beatty & Sons
F. H. Hopkins & Co.
- MACHINES, BORING AND TURNING**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, CAR SHOP**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, CEMENT**
Jas. W. Pyke & Co.
- MACHINES, DRILLING**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, HOISTING**
M. Beatty & Sons
Brown Hoisting Machinery Co.
- MACHINES, HYDRAULIC**
R. D. Wood & Co.
- MACHINES, MILLING**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, PLANING AND SHAPING**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, RADIAL DRILLING**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, RAIL DRILLING**
F. H. Hopkins & Co.
- MACHINES, RIVETTING**
Long & Allstatler Co.

Flange Lubrication Should be Automatic

Flange lubrication to be efficient should be automatic, absolutely independent of your engineer, and at the same time the device itself should be so simple and yet so accurate that it will be practically trouble proof. The

Detroit Automatic Flange Lubricator (Pendulum Type)

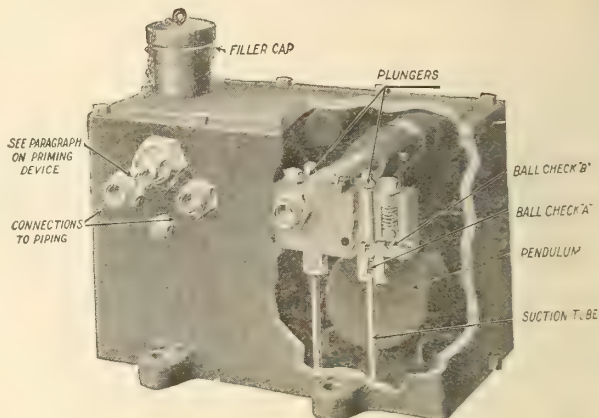
is absolutely automatic and at the same time simple. It is all in the pendulum. Any lateral movement of the locomotive causes the pendulum to swing. This oscillation rotates, rocker-like, the pendulum shaft, which produces alternating strokes of the two plungers in the pumping unit.

The use of the Detroit Automatic Flange Lubricator insures positive lubrication just when it is needed. May we send booklet F-O 81? It contains all the facts as well as drawings. Write to-day.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.

WALKERVILLE, ONT.

Canadian Sales Agents: Taylor & Arnold, Ltd., Montreal.



The Imperial Guarantee and Accident Insurance Co. of Canada

Imperial Protection Accident and Sickness Insurance
Guarantee Bonds Plate Glass and Automobile Insurance

A Strong Canadian Company

Head Office, 44 King St. W., Toronto, Ont.

Branch Offices:

Montreal, Que., Canada Life Bldg.

Winnipeg, Man., Merchants Bank Bldg.

Calgary, Alta., Canada Life Bldg.

Vancouver, B.C., 546 Pender St. W.

The Canadian Bridge Co., Limited Walkerville, Ontario

Locomotive
Turntables
Roofs
Steel Buildings

Manufacturers of
**Railway and Highway
BRIDGES**

Structural
Iron Work
of all
Descriptions

**Sessions-Standard
Friction Draft Gear**

Simplest and Best

Both
Made by
Standard Coupler Co.
30 CHURCH STREET, NEW YORK

**Standard Steel
Platforms**

Used by all Canadian Railways

J. S. COFFIN
Chairman

SAMUEL G. ALLEN
President

W. H. COYLE
Vice-President

C. L. WINEY
Sec'y. and Treas.

FRANKLIN RAILWAY SUPPLY COMPANY

Specialists—In Devices That Make for Economy

MAIN OFFICE, 30 CHURCH ST., NEW YORK

CHICAGO OFFICE: 332 South Michigan Ave.

MONTREAL OFFICE: 625 Transportation Bldg.

SAN FRANCISCO OFFICE: 795 Monadnock Bldg.

MACHINES, SLOTTING

John Bertram & Sons Co.
Canada Machinery Corporation

MACHINES, TRACKLAYING

F. H. Hopkins & Co.

MACHINES, WOOD AND IRON WORKING

Canada Machinery Corporation

MACHINE TOOLS

John Bertram & Sons Co.
Canada Machinery Corporation
Pratt & Whitney Co.

MANHOLE FRAMES & COVERS

Canada Iron Foundries
Dominion Brakeshoe Co.

MARINE PAINTS AND VARNISHES

Martin Senour Co.

MARINE REPAIRS

Goldschmidt Thermit Co.

MARINE SUPPLIES

Rice Lewis & Sons

METALS

Goldschmidt Thermit Co.

METAL WORK, STRUCTURAL

Canadian Bridge Co.
Dominion Bridge Co.
Jas. W. Pyke & Co.

MILEPOST NUMBERS

Acton Burrows, Limited

MONEL METAL

International Nickel Co.

MOTOR CARS

Fairmont Gas. Eng. and Ry.
Motor Car Co.

MOTORS, TURNTABLE

Taylor & Arnold

NAILS, CUT AND WIRE

Steel Co. of Canada

NICKEL, SHEET, ROD, WIRE & TUBE

International Nickel Co.

NICKEL, METALLIC SHOT & INGOTS

International Nickel Co.

NUMBERS

Acton Burrows, Limited

NUT LOCKS

Positive Lock Washer Co.

OFFICE FITTINGS

Can. Office & School Furn. Co.

OFFICE SIGNS

Acton Burrows, Limited

OILS

Galena-Signal Oil Co.

PACKING

Carlock Packing Co.

PAINTS

Martin Senour Co.

PATENT ATTORNEYS

H. J. S. Dennison

H. C. Shipman & Co.

Van Hallen & O'Neil

PILE DRIVERS, RAILWAY

F. H. Hopkins & Co.

PIPE, STEAM

Babcock & Wilcox

PIPE STOCKS

Butterfield & Co.

PIPE, WROUGHT, LEAD AND GALVANIZED

Steel Co. of Canada

PLANERS

John Bertram & Sons Co.

Canada Machinery Corporation

PLATFORMS, STEEL

Standard Coupler Co.

PLoughs, CONTRACTORS'

F. H. Hopkins & Co.

PORTER

E. L. Drewry

PUMPS

F. H. Hopkins & Co.

PUMPS, CENTRIFUGAL

M. Beatty & Sons

F. H. Hopkins & Co.

R. D. Wood & Co.

PUNCHES AND SHEARS

Canada Machinery Corporation

Long & Allstatter Co.

PUTTY

Steel Co. of Canada

RAIL BONDS

Ohio Brass Co.

Elec. Railway Improvement Co.

RAIL BENDERS

Canadian Steel Foundries, Ltd.

RAIL JOINTS

Goldschmidt Thermit Co.

The Rail Joint Co. of Canada

RAILS, NEW

Algoma Steel Corporation

Dominion Iron & Steel Co.

J. J. Gartshore

F. H. Hopkins & Co.

RAILS FOR RELAYING

J. J. Gartshore

Jas. W. Pyke & Co.

RAILWAY SUPPLIES

Franklin Railway Supply Co.

F. H. Hopkins & Co.

Rice Lewis & Sons

The Hiram L. Piper Co.

REAMERS

Butterfield & Co.

REPLACERS, CAR AND LOCOMOTIVE

F. H. Hopkins & Co.

RIVETS

Steel Co. of Canada, Ltd.

ROCK CRUSHERS

F. H. Hopkins & Co.

ROPES, DERRICK

Dominion Wire Rope Co.

ROOFING, CAR

Franklin Railway Supply Co.

F. H. Hopkins & Co.

RUBBER GOODS

Can. Consolidated Rubber Co.

SANDERS, PNEUMATIC

Ohio Brass Co.

SAWS, HACK

Diamond Saw & Stamping Co.

SCOWS, DUMP AND DECK

M. Beatty & Sons

SCREW PLATES

Butterfield & Co.

SCRAPERS, WHEEL AND DRAG

F. H. Hopkins & Co.

SCREWS, WOOD AND MACHINE

John Morrow Screw and Nut Co.

Steel Co. of Canada

SEMAPHORE ARMS

Acton Burrows, Limited

SHIPS

Polson Iron Works

SIGNAL HOUSE NUMBERS

Acton Burrows, Limited

SIGNALS

Gen. Railway Signal Co. of Can.

The Hiram L. Piper Co.

Acton Burrows, Limited

SKYLIGHTS

Kinnear Manufacturing Co.

SNOW PLOUGHS

Crossen Car Co.

F. H. Hopkins & Co.

SPIKES, RAILWAY, SHIP OR PRESSED

Nova Scotia Steel and Coal Co.

Steel Co. of Canada

SPlicing TUBES AND COM- POUNDS

Standard Und. Cable Co. of Can.

SPREADER CARS

F. H. Hopkins & Co.

SPRINGS

Canadian Steel Foundries, Ltd.

B. J. Coghlin & Co.

SPRINKLERS, ELECTRIC

Preston Car & Coach Co.

STAPLES

Steel Co. of Canada

STATION NAME SIGNS

Acton Burrows, Limited

STAYBOLT IRON

Taylor & Arnold

Trolley Supply Co.

STAYBOLTS, FLEXIBLE

Flannery Bolt Co.

STAYBOLTS, LOCOMOTIVE

Flannery Bolt Co.

STAYBOLT TAPS

Butterfield & Co.

STEAM HAMMERS

John Bertram & Sons Co.

STEAM SHOVELS

M. Beatty & Sons

F. H. Hopkins & Co.

STEAMSHIP SIGNS

Acton Burrows, Limited

STEEL

F. H. Hopkins & Co.

Nova Scotia Steel and Coal Co.

STEEL, FIRE BOX

Taylor & Arnold

Canadian Steel Foundries, Ltd.

STEEL FOR AXES

Canadian Steel Foundries, Ltd.

STEEL FOR SAWS

Canadian Steel Foundries, Ltd.

STEEL FOR TIRES

Steel Co. of Canada

STEEL SHAFTING

Nova Scotia Steel and Coal Co.

STEEL PLATES

Jas. W. Pyke & Co.

STEEL, TOOL

Canadian Steel Foundries, Ltd.

F. H. Hopkins & Co.

STOKERS, MECHANICAL

Babcock & Wilcox

STRAINERS

Babcock & Wilcox

SUPERHEATERS

Babcock & Wilcox

Locomotive Superheater Co.

SWITCH TARGETS

Acton Burrows, Limited

TACKS

Steel Co. of Canada

TANKS AND TANK FIXTURES

F. H. Hopkins & Co.

Polson Iron Works

TANKS, PORTABLE ACETYLENE, WELDING

Commercial Acetylene Ry. Lt. and Sig. Co.

TAPS

Butterfield & Co.

TELEGRAPH AND TELEPHONE OFFICE SIGNS

Acton Burrows, Limited

TERMINALS, JUNCTION BOXES

Standard Und. Cable Co. of Can.

THERMIT

Goldschmidt Thermit Co.

TIE PLATES

Algoma Steel Corporation

B. J. Coghlin

Nova Scotia Steel and Coal Co.

Steel Co. of Canada

TICKET CASES

Canadian Office & School Fur. Co.

TIRES, STEEL

Jas. W. Pyke & Co.

TOOLS AND SUPPLIES

F. H. Hopkins & Co.

Pratt & Whitney Co.

TOOLS, CAST STEEL

Dominion Brakeshoe Co.

TOOLS, TRACK

John Bertram & Sons Co.

Canadian Steel Foundries, Ltd.

B. J. Coghlin Co.

F. H. Hopkins & Co.

TOOLS, PNEUMATIC

Independent Pneumatic Tool Co.

TRAMWAY EQUIPMENT

J. J. Gartshore

F. H. Hopkins & Co.

TRACK EQUIPMENT

F. H. Hopkins & Co.

TROLLEY BASES

Allen General Supplies, Ltd.

Ohio Brass Co.

TROLLEY CATCHERS

Allen General Supplies, Ltd.

Ohio Brass Co.

Trolley Supply Co.

TROLLEY GUARDS

Ohio Brass Co.

Trolley Supply Co.

TROLLEY RETRIEVERS

Allen General Supplies, Ltd.

Ohio Brass Co.

Trolley Supply Co.

TROLLEY WHEELS

Star Brass Works

TRUCKS, ELECTRIC CAR

Canadian Steel Foundries, Ltd.

TRUSSES, ROOF

Canadian Bridge Co.

Dominion Bridge Co.

TUBES, BOILER

F. H. Hopkins & Co.

TUBE CLEANERS

F. H. Hopkins & Co.

TURNBUCKLES

Canadian Steel Foundries, Ltd.

TURNTABLES

Canadian Bridge Co.

Dominion Bridge Co.

UPHOLSTERY, CAR

Du Pont Fabrikoid Co.

VALVES

Canadian Detroit Lubricator Co.

R. D. Wood & Co.

VALVES, ANGLE AND GLOBE

Ohio Brass Co.

VALVES, BRASS GATE

Ohio Brass Co.

VALVES, LOCOMOTIVE POP

Taylor & Arnold

VARNISHES

Berry Bros.

Martin Senour Co.

VENTILATORS, CAR

Automatic Ventilator Co.

<

A		D		M	
Algoma Steel Corporation.....	21	Date, John	78	Marconi Wireless Telegraph Co...	70
Alton General Supplies, Ltd.	78	Dearborn Chemical Co. of Canada	13	Martin-Senour Co., The.....	19
Arnold Co.	79	Dennison, H. J. S.	79	Montreal Locomotive Works.....	18
Automatic Ventilator Co.....	72	Diamond Saw & Stamping Works	77	Morrow, John Screw & Nut Co...	77
B		Dominion Brakeshoe Co.	78	N	
Babcock & Wilcox.....	24	E		National Steel Car Co.....	86
Beatty, M. & Sons, Co.....	78	Electric Railway Improvement Co.	73	Nicholson File Co.....	2
Berry Bros.	12	F		Norton, A. O., Inc.....	12
Bertram, John & Sons, Co.....	1	Fairmont Gas Engine & Ry. Mo-		Northern Electric Co.....	75
Bradstreet Company	77	tor Car Co.....	80	Nova Scotia Steel & Coal Co....	16
Brown Hoisting Machinery Co...	8	Flannery Bolt Co.....	6 and 14	O	
Buffalo Brake Beam Co.	23	Franklin Railway Supply Co....	82	Ohio Brass Co.....	11
Burrows—Acton Burrows, Ltd...	74	G		Ottawa Car Manufacturing Co...	74
Butterfield & Co.	77	Galena-Signal Oil Co.....	5	P	
C		Garlock Packing Co.....	15	Pedlar People, Ltd.....	20
Canada Iron Foundries, Ltd....	24	Gartshore, J. J.	74	Piper, The Hiram L., Co.....	75
Canada Machinery Corporation..	3	General Ry. Signal Co. of Canada	85	Polson Iron Works.....	17
Canada Steamship Lines, Ltd....	71	Goldschmidt Thermit Co.	13	Positive Lock Washer Co.....	76
Canadian Brakeshoe Co.....	76	Grand Trunk Railway.....	10	Pratt & Whitney Co. of Canada..	25
Canadian Bridge Co.....	82	Griffin & Brinkerhoff.....	77	Preston Car and Coach Co.....	76
Canadian Bronze, Ltd.....	75	H		Pyke, J. W. & Co.....	22
Canadian Consolidated Rubber Co.	26	Hart-Otis Car Co.	11	R	
Canadian Detroit Lubricator Co.	82	Hopkins, F. H. & Co.....	9	Rail Joint Co. of Canada.....	84
Canadian Fairbanks-Morse Co...	20	Hunt, Robert W. & Co.....	79	Roberts & Schaefer Co... 19 and	79
Canadian Government Railways..	22	Hunt-Spiller Mfg. Corporation...	79	S	
Canadian Locomotive Co.	16	I		Shipman, Harold C., & Co.....	79
Canadian National Carbon Co...	73	Imperial Bank of Canada.....	76	Sinclair, Angus.....	79
Canadian Northern Railway.....	18	*Imperial Guar. & Acc. Ins. Co.	82	Standard Coupler Co.....	82
Canadian Office & School Furni-		Independent Pneumatic Tool Co.	23	Standard Underground Cable Co.	
ture Co.....	79	International Correspond. Schools	75	of Canada.....	76
Canadian Pacific Railway.....	74	International Nickel Co.....	80	Star Brass Works	23
Canadian Steel Foundries, Ltd...	15	J		Steel Co. of Canada.....	4
Canadian Westinghouse Co.....	2	Jacobs & Davies.....	79	T	
Canuck Supply Co.....	7	K		Taylor & Arnold.....	22
Chicago Car Heating Co.....	83	Kinnear Manufacturing Co.....	80	Terry & Tench Co.....	79
Coghlin, B. J., Co.....	25	L		Trolley Supply Co.....	73
Commercial Acetylene Ry., Light		Lewis, Rice & Son.....	24	V	
& Signal Co.....	21	Locomotive Superheater Co.....	21	Van Hallen & O'Neil.....	79
Consolidated Car Heating Co....	77	Long & Allstatter Co.....	10	W	
Crosen Car Co.....	14			Wood, R. D., & Co.....	79
D					

*Advertisements marked with an asterisk appear in alternate issues.

Grand Prize, San Francisco, 1915.

Absolute Permissive Block-



is the title of a new bulletin on a thoroughly tried-out single-track signal-system which has been installed on 21 steam and electric railways, totaling 2,323 miles of Absolute-Permissive Signaling.

The cost of installation per mile of the A-P-B System is less than one-half the cost per mile of the steel in your tracks. The maintenance and operation is close to 50 cents per mile per day. An increase in your track capacity of only about 4 per cent. will pay for the investment. In addition to increasing your track capacity, the A-P-B System provides "protection" and eliminates numerous delays. If you are contemplating double-tracking your line, the Absolute Permissive Block System will save you approximately 9/10 of the cost and give you the signal protection you need.

Mr. W. J. Eck, President of the Railway Signal Association, in a report on the "Progress of Signaling" which appeared in the December 31, 1915, issue of the Railway Age Gazette, wrote in part as follows:

"Single-track automatic signaling is receiving an increasing amount of attention and the mileage in-

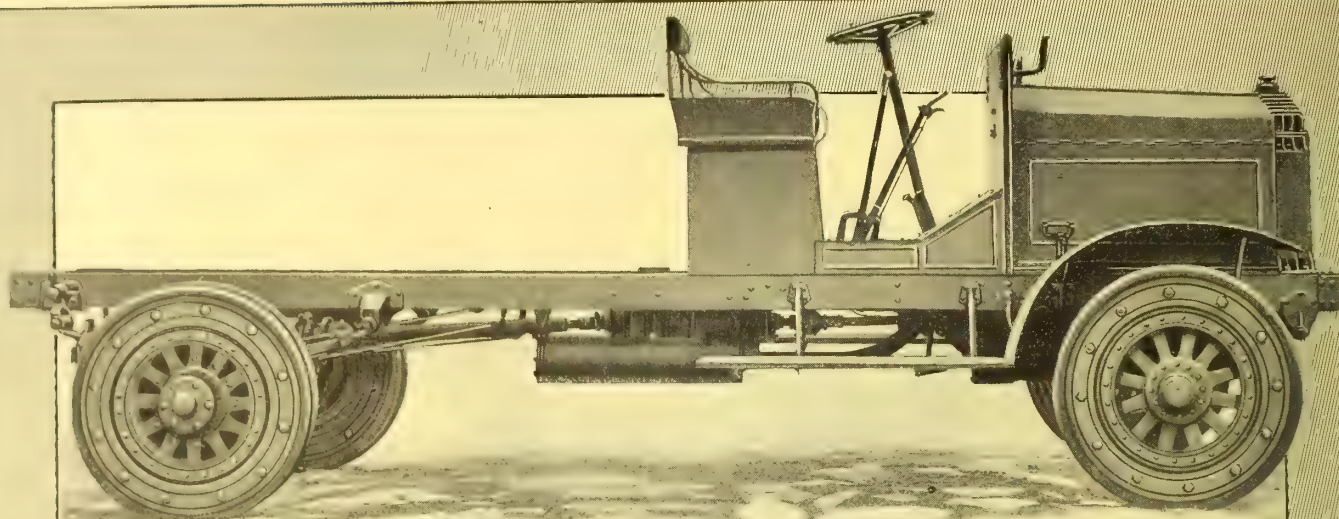
stalled during the year greatly exceeds that on double track. It has been only a few years since railway officers believed that automatic signals on single track would hinder instead of facilitate movements. Particularly since the so-called 'absolute permissive block' has been developed has this idea given way to a realization of the safety and aid that the system affords. In the A-P-B System for single-track signaling the trains are given an absolute block from passing siding to passing siding for opposing trains and a permissive block for following trains. This system has been almost exclusively installed during the past year."

Ask for a copy of Bulletin 128-A and learn more fully of the desirable features of this System.

GENERAL RAILWAY SIGNAL COMPANY
OF CANADA LIMITED

LACHINE

QUEBEC



For Hauling Heavy Freight or for Fast Express Service

The NATIONAL MOTOR TRUCK

is the best investment that you can make. The National is a sturdily built Truck that stays on the road all the time. National Trucks are doing duty over city pavements and country roads; carrying heavy loads without a falter or a stop.

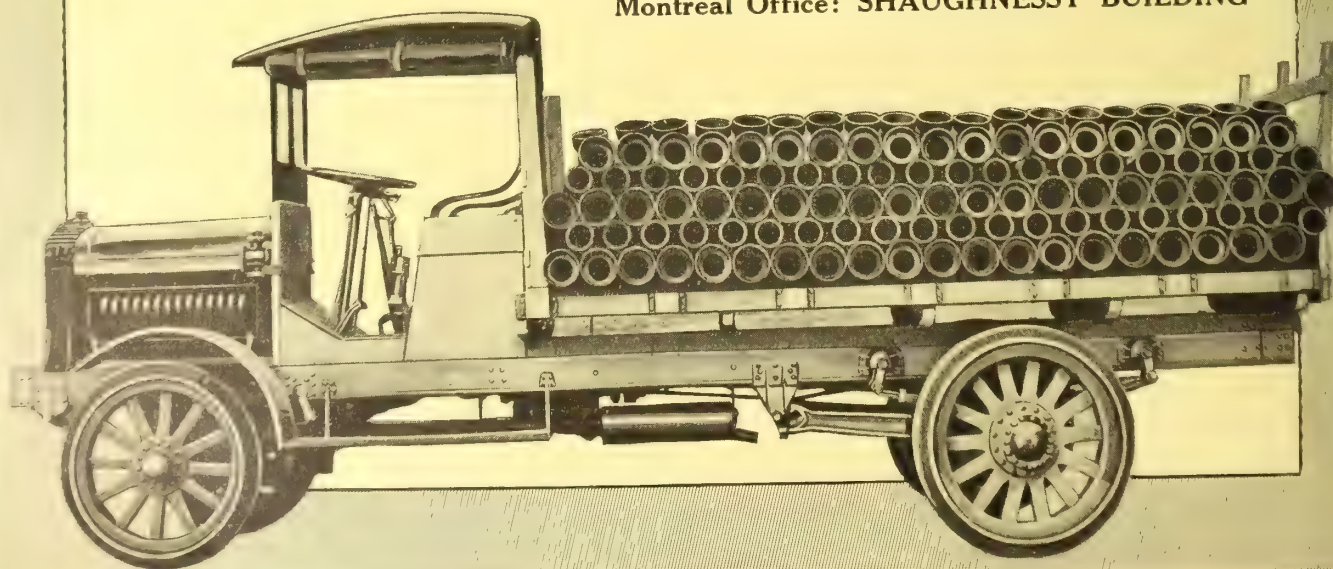
The Engineers who are building NATIONAL Motor Trucks have made a special study of the conditions under which a Truck must operate in Canadian cities. The NATIONAL is a Canadian Made Truck. It is guaranteed by a Canadian Company.

You owe it to your Company and to your self to get all the information about the NATIONAL line of Trucks. Five models: 1500 lbs., 2000 lbs., 3000 lbs., 4000 lbs. and 7000 lbs. capacities.

Catalogue mailed upon request.

NATIONAL STEEL CAR CO., Limited, HAMILTON, CANADA

Montreal Office: SHAUGHNESSY BUILDING



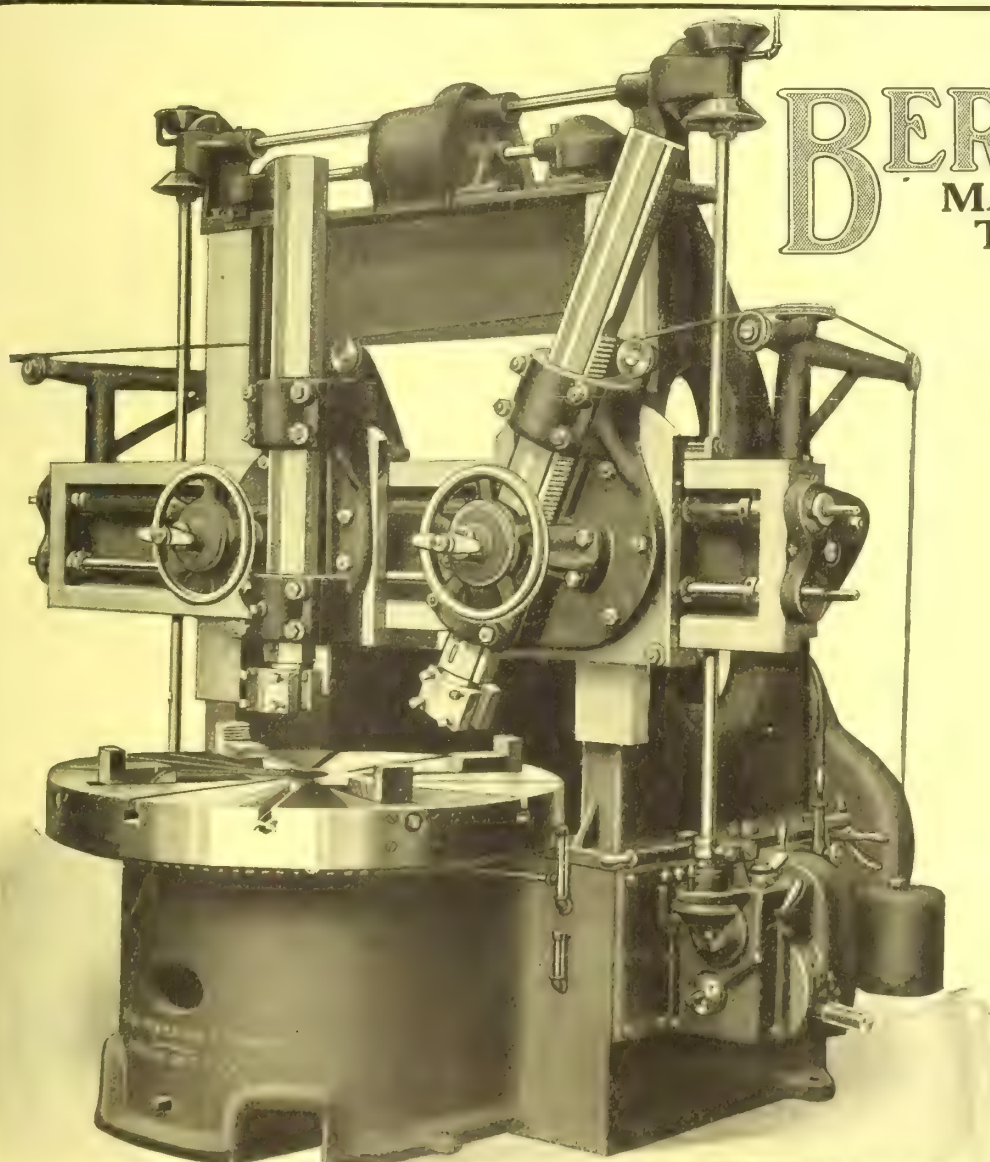
Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 221

TORONTO, CANADA, JULY, 1916

Subscription Rates, Page 277



BERTRAM

MACHINE
TOOLS

42-inch
Vertical
Boring
and
Turning
Mill

*Niles
Type*

Motor-driven through
speed box.

Built in sizes from 42-
inch to 100-inch swing.

Drop us a line for Pho-
tographs and full par-
ticulars.

NEGRO PHOTO 1057

Locomotive and Car Shop Equipment.

The John Bertram & Sons Co., Limited

Dundas, Ontario, Canada

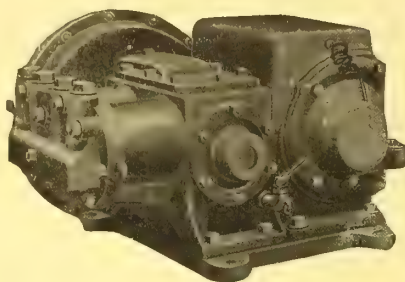
MONTREAL
723 Drummond Bldg.

VANCOUVER
609 Bank of Ottawa Bldg.

WINNIPEG
1205 McArthur Bldg.

Westinghouse Motor-Driven Air Compressors

Built in four standard capacities rated at $14\frac{1}{2}$, 25, $37\frac{1}{2}$ and 50 cubic feet of free air per minute,—fitted with 600 volt direct-current motors.

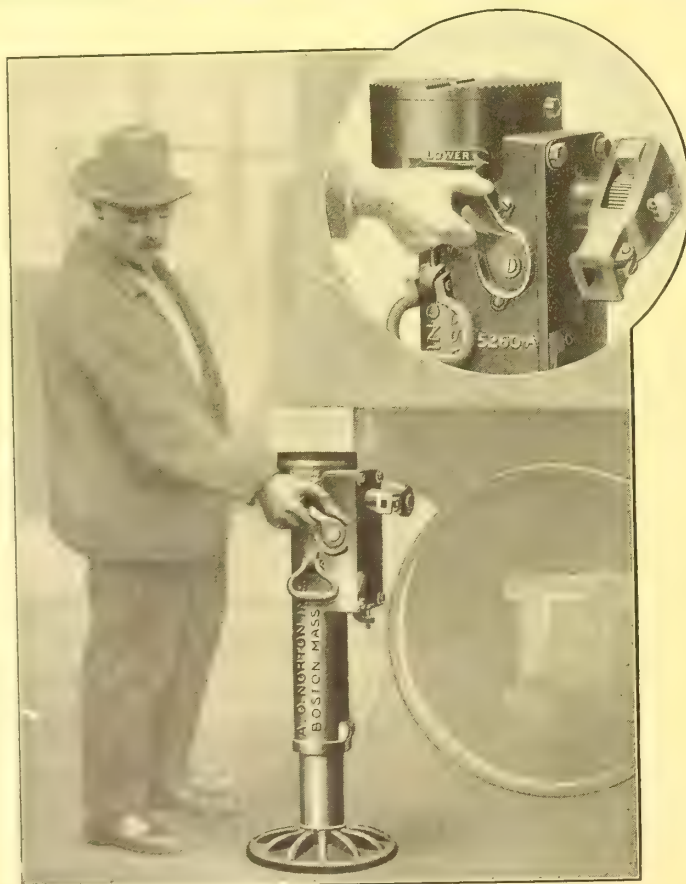


When desired we fit them with 110 or 220 volt motors for 100, 200 and 400 volts, 25 or 60 cycle, and single-phase motors for 60 cycles.

The compressors are simple, reliable, compact, durable, and are easy to operate.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

TORONTO, Traders Bank Bldg. MONTREAL, 52 Victoria Sq. OTTAWA, Ahearn & Soper, Ltd. HALIFAX, 105 Hollis St. FT. WILLIAM, Telfer Bldg.
WINNIPEG, 158 Portage Ave. E. CALGARY, Grain Exchange Bldg. EDMONTON, Dominion Bldg. VANCOUVER, Bank of Ottawa Bldg.



Don't Pump Your Jack Down

Lower the Load by "Pressing the Button"

The Norton Self Lowering Jack

is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

Send for Illustrated Catalogue No. 28.

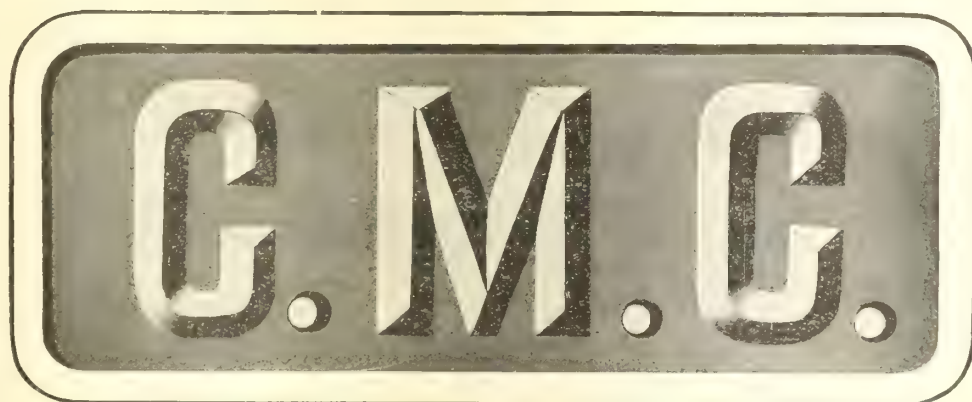
A. O. Norton, Limited
Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents:
MUSSENS LIMITED

Montreal Toronto Winnipeg Cobalt Calgary
Vancouver

EVERY MACHINE

Manufactured by Us Bears
This Registered Trade Mark



This Trade Mark is a guarantee that the materials, design and workmanship are of the highest class.

Insure satisfactory service by insisting on having this Trade Mark on your—

**Wood and Iron Working
Machine Tools**

For convenience of the trade we have opened show-rooms in Toronto, at Brock Avenue Subway, where a full line of our machinery can be inspected.

CANADA MACHINERY CORPORATION
LIMITED

GALT, ONTARIO

Builders of Machine Tools and Woodworking Machinery.

*destroyed
Nov 11/20*

Its uses are so many
that it is never idle.

BROWNHOIST Locomotive Crane

is used from start to finish on track construction work — excavating, filling in, driving piles, unloading ties and rails, and placing the ballast. The crane is one man operated and does the work of 25 to 40 men. Its daily cost is only \$8 to \$10 including depreciation, 6% interest, and all operating costs.

The illustration shows the crane working with drop hammer and wooden leads for driving piling. A steam hammer can also be used, the steam being furnished from the boiler on the crane. And leads can be provided which permit driving batter piles.

These many operations are shown in our catalog I which will be sent upon request.

The Brown Hoisting Machinery Co.
Cleveland, Ohio

MONTREAL OFFICE
145 St. James Street



**Quality****Service**

The Steel Company of Canada, Limited

PRODUCTS

"HAMILTON" PIG IRON
BASIC, MALLEABLE AND FOUNDRY

IRON AND STEEL
BLOOMS, BILLETS, BARS, WIRE RODS, ANGLES, CHANNELS,
PLow BEAMS, ETC.

FORGINGS

Car Axles, Shape and Drop Forgings, Horse Shoes, Carriage and Automobile Hardware, Top Goods, Etc.

WIRE, ETC.

Steel, Brass, Copper and Bronze, Heavy and Fine, Bright Annealed, Coppered, Liquor Bright Galvanized and Tinned. Stranded, Steel and Copper Cable, Clothes Line, Wire Nails, Staples, Barb Wire, Woven Wire Fencing, Fence Gates

RAILWAY FASTENINGS

Angle Bars, Track Bolts, Tie Plates, Spikes, Tie Rods, Etc.

NAILS, SPIKES, RIVETS, ETC.

Wire, Cut, Boat and Horse Shoe Nails, Railway, Pressed and Drift Spikes
Tack and Shoe Nails, Steel and Copper Rivets and Burrs, Iron, Brass and Copper

POLE LINE HARDWARE

Pole Steps, Cross Arm Braces, Guy Clamps and Guy Rods, Etc., Black and Galvanized

BOLTS, NUTS AND WASHERS

Machine, Carriage, Elevator, Stove, Tire and Sleigh Shoe Bolts, Blank, Tapped Nuts and Washers

WROUGHT PIPE

Black and Galvanized Nipples and Couplings

SCREWS

Wood and Machine Steel, Brass and Bronze

LEAD PRODUCTS

Lead Pipe, White Lead, Shot and Putty

The Steel Company of Canada, Limited

HAMILTON**TORONTO****MONTREAL****WINNIPEG**

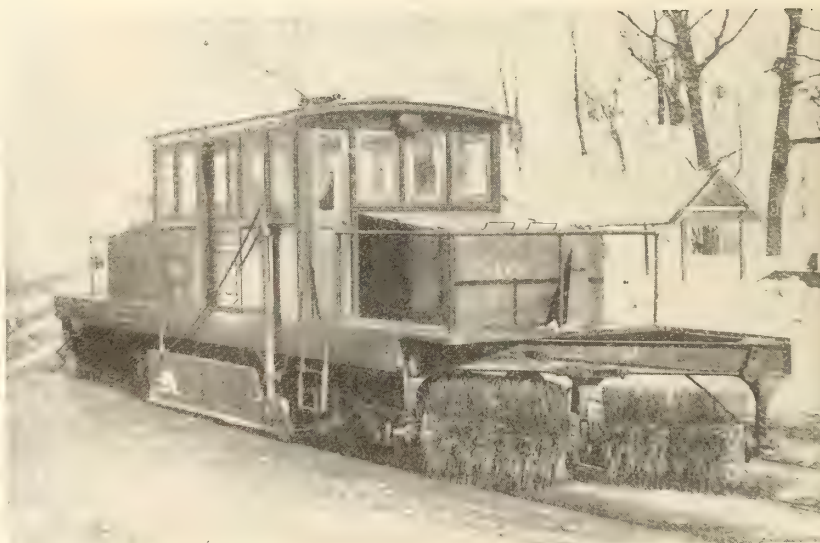
Highest
Efficiency

CARS
Made
Right

Lowest
Upkeep
Cost

The
OTTAWA CAR
Manufacturing Co., Limited
are Designers and Builders of

Electric City and Interurban Passenger cars. Electric express cars and locomotives. Sprinklers and work cars. Car seats, car curtains and a very large variety of brass and bronze car fittings.



Snow Sweepers and Plows — the most perfect design and construction, simple mechanism, quick and effective operation. An immediate delivery can be made of Standard Sweepers, special types designed and built or built to your own specifications.

“Send Them Your Enquiries”

as they are at your service for
specifications, drawings,
estimates and
prices

Always
Ready
for Service

Satisfaction
assured on all
orders and deliveries
made promptly

Continuous
work has proved
their worth

Remember the Address: **Cor. KENT and SLATER STS., OTTAWA, ONT.**

Absolute Permissive Block-



is the title of a new bulletin on a thoroughly tried-out single-track signal-system which has been installed on 21 steam and electric railways, totaling 2,323 miles of Absolute-Permissive Signaling.

The cost of installation per mile of the A-P-B System is less than one-half the cost per mile of the steel in your tracks. The maintenance and operation is close to 50 cents per mile per day. An increase in your track capacity of only about 4 per cent. will pay for the investment. In addition to increasing your track capacity, the A-P-B System provides "protection" and eliminates numerous delays. If you are contemplating double-tracking your line, the Absolute Permissive Block System will save you approximately 9/10 of the cost and give you the signal protection you need.

Mr. W. J. Eck, President of the Railway Signal Association, in a report on the "Progress of Signaling" which appeared in the December 31, 1915, issue of the Railway Age Gazette, wrote in part as follows:

"Single-track automatic signaling is receiving an increasing amount of attention and the mileage in-

stalled during the year greatly exceeds that on double track. It has been only a few years since railway officers believed that automatic signals on single track would hinder instead of facilitate movements. Particularly since the so-called 'absolute permissive block' has been developed has this idea given way to a realization of the safety and aid that the system affords. In the A-P-B System for single-track signaling the trains are given an absolute block from passing siding to passing siding for opposing trains and a permissive block for following trains. This system has been almost exclusively installed during the past year."

Ask for a copy of Bulletin 128A and learn more fully of the desirable features of this System.

GENERAL RAILWAY SIGNAL COMPANY
OF CANADA LIMITED

LACHINE

QUEBEC

Hunt-Spiller Gun Iron

IN

LOCOMOTIVE CASTINGS

DECREASES: Engine Failures — Engine Repairs.

INCREASES: Engine Efficiency — Engine Mileage.

SAVES MONEY

SPECIFY IT for your NEW POWER
ORDER IT for your RENEWALS

AND GET

The Service Other Roads are Getting
in Superheater Locomotives

MADE ONLY BY

HUNT-SPILLER MFG. CORPORATION

W. B. LEACH, President and General Manager

OFFICE and WORKS

383 Dorchester Avenue,
So. Boston, Mass.

Canadian Representative

Canuck Supply Company, Limited
418 St. James St., Montreal, P.Q.

J. G. PLATT,
Sales Manager



THE REASON THAT OUR
WIRE ROPES

are paramount is due to our manufacturing experience, large scale production, manufacturing facilities, and ideals of quality.

"Made in Canada" and stocks carried at Montreal, Winnipeg and St. Catharines

The Dominion Wire Rope Company, Limited

General Service Cars

Otis Dump Cars

— PATENTED —

Built in Any Size
or Capacity

=====
All Steel, Wood or
Composite



For Standard or
Special Service

=====
Thousands in Use

The Standard Coal Car on Canada's Leading Railroads.

Designed and Built by

The HART-OTIS CAR CO., Limited, MONTREAL

—Sole Patentees for General Service Cars for Canada—

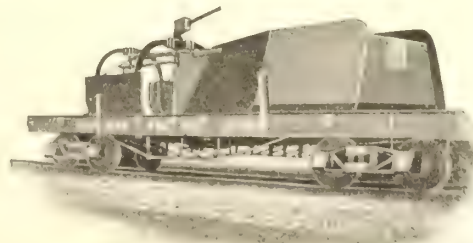


"H & E" Ball and Cone Bearing **Lifting Jacks**
Are the Fastest Jacks Made

"MARION" Ballast Unloaders

Constructed entirely of Steel.

They work as well in Dumping
Boulders or Ballast Rock as in
Clay, Loam, Gravel and Crushed Stone.



May be used on ordinary Flat Cars.

1061 Branch:
St. Catharines, Ont.

F. H. Hopkins & Co

Head Office:
MONTREAL



The Land of Fishing Thrills

A Sportsman's Paradise where the cool waters of **Wild, Unspoiled Lakes and Rivers** give the Salmon and Speckled Trout and gamy Black Bass fighting qualities to delight the most ardent angler, making

Algonquin Park (Ontario)



NOMINIGAN CAMP, ALGONQUIN PROVINCIAL PARK

a vacation territory to dream about. It offers canoe trips through myriads of waterways, with ideal camping grounds among forests of pines and balsams.

2,000 Feet Above the Sea

Fine accommodation for those who love the social side of resort life can be had at Highland Inn at Algonquin Park Station, or in the novel and comfortable Log Cabin Camps Nominigan and Minnesing.

Handsomely Illustrated advertising matter and full information supplied free on application to C. E. HORNING, Union Station, Toronto, or to J. QUINLAN, Bonaventure Station, Montreal.

RESULTS COUNT

That's Why 465 Railroad Shops Are Using Thermit

Thermit offers the only sure and reliable repair for locomotive frames and other heavy sections.

The superheated liquid Thermit steel is produced in bulk and poured all at once into a mold surrounding a broken section, resulting in the perfect amalgamation of the Thermit steel with the parts with which it comes in contact. The fact that those parts are first preheated, makes the weld doubly sure.

The operation of welding locomotive frames is easily accomplished, without removing the frame from position, and with very little dismantling, no matter if the frame be broken in the splice, jaw, next to the cylinder saddle, or at any other point. The engine is returned to service in from ten to twelve hours.

Hundreds of thousands of pounds of Thermit are being used annually by railroad companies in the United States and Canada.

There is only one reason for this, and that is that Thermit produces results and we all know that "results count."

Our pamphlet No. 2144 will be of interest.

All Thermit and Thermit appliances are made in our Canadian shops.

GOLDSCHMIDT THERMIT COMPANY

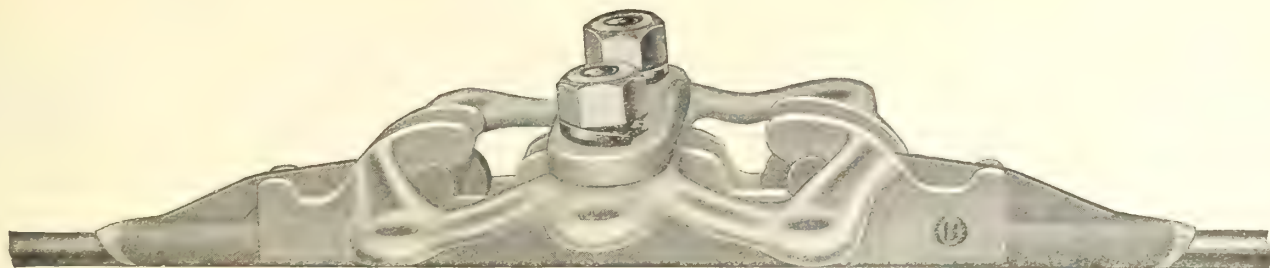
103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco

120 Broadway, New York

7300 So. Chicago Ave., Chicago





A Solderless Trolley Anchor

The clamp casting in the center and the two cam tips hold the wire firmly in the O-B Type B Strain Plate.

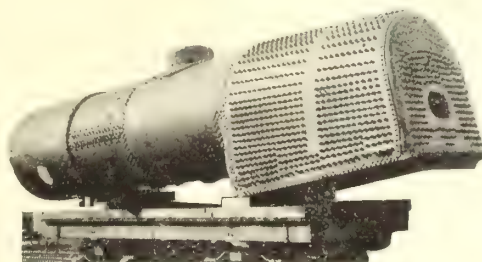
Has smooth under-run and plenty of clearance for trolley wheel.

Provided with six holes for guy wire.

Listed with other O-B Line Material in General Catalog No. 16.

The Ohio Brass Company

Mansfield, Ohio



It is an Established Fact

That fireboxes of all types equipped with the Tate Flexible Staybolt show the lowest maintenance cost and highest earnings.

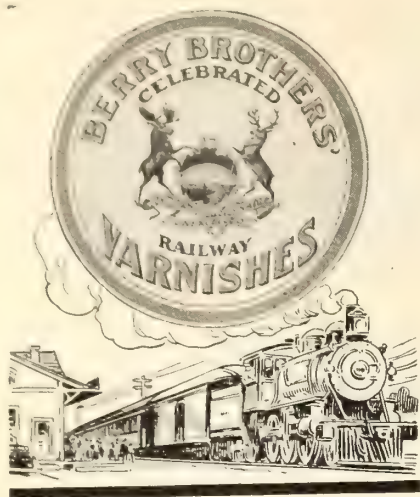
The Flexibility in the bolt serves to accommodate the relative expansion of plates under working operations of the fire box and boiler in a manner that has afforded less destruction to the sheets and seams than were found under conditions where fireboxes were rigidly stayed.

The Tate Flexible Staybolt is designed and made to give satisfactory results in the final measure of its usefulness, as an economic, safe and reliable factor in reducing the costs of firebox repairs and maintenance.

In use on all the prominent railroad systems of Canada.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.



Berry Brothers' Railway Varnishes

Represent Nearly 60 Years of Varnish Making Experience

These are a few of the many finishes for locomotives that you should know.

Locomotive Black

A fossil gum varnish of the highest grade—for the best attainable finish on locomotives, tenders and valuable rolling stock, combines excellence with durability—efficient because its use is true economy—a case of the best being the cheapest.

Hand Rail Black

Especially adapted for imparting an attractive finish to hand rails. It dries quickly and hardens with a smooth, handsome lustre, and has no tendency to get soft or tacky when handled.

Front End Black

For the front end of locomotives. It covers well, makes a handsome jet black finish, and stands a high degree of heat without injury.

Smoke Stack Black

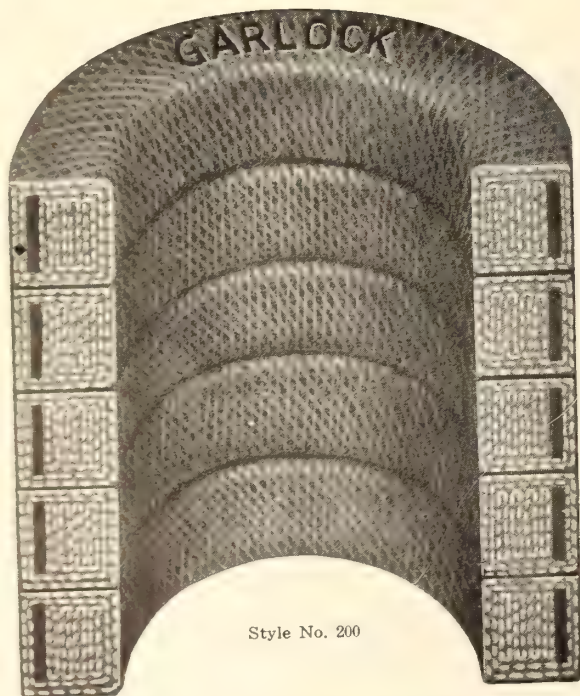
Made especially for use on smoke stacks, producing a jet black and brilliant lustre, and resisting heat of a high degree without injury.

If you have not already received a copy of our new catalog of Railway Varnishes, write us today, for the best catalog of its kind ever published.

BERRY BROTHERS
(INCORPORATED)
World's Largest Varnish Makers

WALKERVILLE

ONTARIO



Style No. 200

Garlock High Pressure Piston Rod Packing

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.

THE GARLOCK PACKING COMPANY

Hamilton, Ontario

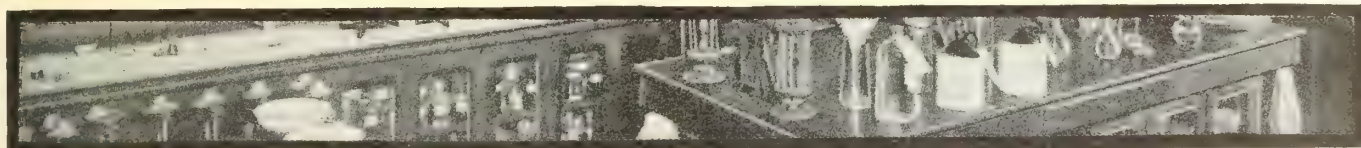


OF

Branches:

Montreal, Que., 342 St. James St. East Toronto, Ont., Continental Life Bldg.
Winnipeg, Man., Galt Building





Scientific Treatment of Boiler Waters

Dearborn Service to Railroads

Twenty-five years devoted to the subject of water chemistry, embracing the analysis and successful treatment of waters in all parts of America, and in many countries of the eastern continent as well, including supplies used in locomotive, stationary and marine boilers of every type and size, and operated under the varying conditions that obtain in different industries, gives us a background of experience which is of value in handling new problems, and an assurance to our customers that only expert, efficient service will be offered them.

Scores of Railroads are using Water Treating Preparations compounded by us to meet their requirements, with great benefit to the railroad companies, in the increased life of the boilers, reduced consumption of fuel and lubricating oil, ability to haul greater tonnage, increased mileage between boiler washings, and generally improved operating conditions.

We would be glad to analyze the waters on districts where you are having trouble, and advise with you regarding treatment.

Dearborn Chemical Company of Canada, Limited

Office and Works : 1220-1230 Dundas Street, Toronto, Canada

Nova Scotia Steel and Coal Co., Limited

Manufacturers of

MARINE, RAILWAY AND GENERAL ENGINEERING FORGINGS OF ALL SHAPES AND UP TO 40 TONS IN WEIGHT, MADE FROM BEST ORDINARY OR HARMET FLUID COMPRESSED OPEN-HEARTH STEEL. OUR FORGE IS EQUIPPED WITH THE MOST MODERN STEAM HYDRAULIC PRESSES.

RAILWAY TRACK MATERIAL, fish plate, tie plate, track bolts, spikes, tee rails—12 to 40 lbs. per yard.

ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

ALSO MINERS AND SHIPPERS OF THE CELEBRATED "OLD SYDNEY" COAL.
HIGH CALORIFIC VALUE—LOW ASH—UNEXCELLED FOR STEAM-RAISING PURPOSES.
BEST HOUSE COAL MINED IN CANADA.

Collieries, Iron and Steel
Furnaces :
SYDNEY MINES, C.B.

Coal Shipping
Piers :
NORTH SYDNEY, C.B.

Finishing Mills, Forge, and
Engineering Shops :
NEW GLASGOW, N.S.

INQUIRIES SOLICITED

Western Steel Sales Office :
Room 14, Windsor Hotel,
Montreal, Que.

Western Coal Sales Office :
219, Board of Trade Bldg.,
Montreal, Que.

Head Office :
New Glasgow, N. S.

CANADIAN STEEL FOUNDRIES LIMITED

STEEL CASTINGS - MANGANESE STEEL CASTINGS
GRAY IRON AND SEMI STEEL CASTINGS - BAR STEEL
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK

GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
LONDON (ENG) OFFICE —
— TRAFALGAR HOUSE, WATERLOO PLACE.

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL



ENGINEER AND PASSENGERS RIDE ON

For Locomotive
Cab Seats



REG. U. S. PAT. OFF.

For Car Seats and
Vestibule Curtains

Is Guaranteed Superior to Coated Splits

Railroad officials know the value of a **guaranteed** article, know too, that coated splits are never guaranteed, and that six months' wear as car seat upholstery shows why. If you're in doubt as to why, send for "How Many Hides Has a Cow?" It tells what coated splits are made from, what Fabrikoid is made of, and why the latter is the equal of best genuine leather. Du Pont Fabrikoid is the ideal material; for cab seats

it is much less expensive than leather, and stands severe service. For coach upholstery, it cuts both initial and maintenance expense. It is tough, yet pliable, will not split nor crack, is waterproof, sanitary, comfortable and combines both saving and service in the most thorough manner. For vestibule curtains, it offers advantages that commend its use in modern railway service.

*Investigate Fabrikoid yourself. See what the economy of Fabrikoid will mean to your road.
Send for free samples and examine them.*

Du Pont Fabrikoid Company

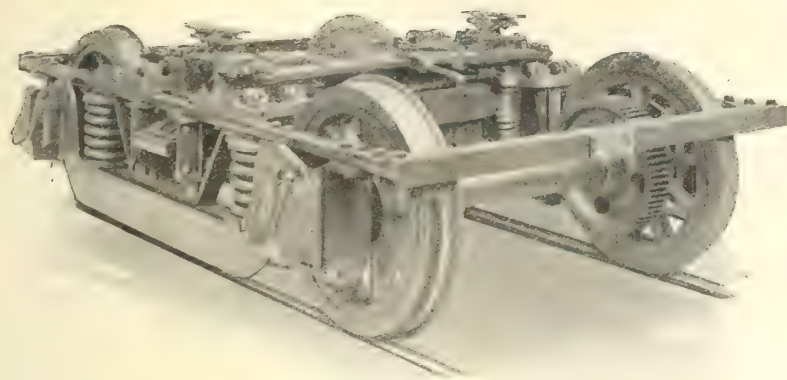
Canadian Factory, Toronto, Canada

Du Pont Building, Wilmington, Del.

Wendell & MacDuffie Co., Railroad Department Representatives, 59 Broadway, New York

Canadian Baldwin Electric Trucks

Interurban Service



Canadian Baldwin Trucks, Class 84-50-AA, built for Lake Erie and Northern Railway, Ontario.

The truck illustrated is designed for high speed on electric railways, and has a rated carrying capacity of 30,000 pounds on the centre plate.

It has frictional side bearings and is of the equalized pedestal type.

Canadian Baldwin trucks, solve the problem of minimum weight, economical maintenance, simple construction, noiseless operation and easy riding.

There is comfort in riding on roads where Canadian Baldwin Trucks are used.

Manufactured in Canada by

Canadian Locomotive Company, Limited
KINGSTON, ONTARIO



Canadian Northern

All the Way

Between

TORONTO WINNIPEG EDMONTON VANCOUVER

With Connections to and from all points.

Freight

Passenger

Express

For all information apply to Company's Offices, 226 St. James St., Montreal, Que.,
68 King St. E., Toronto, Ont. or Union Station, Winnipeg, Man.



10 ft. 0 in. diam. 12 ft. 0 in. Scotch marine boiler for M. Beatty & Sons, Welland, Ont. This boiler was built for 125 lbs. working pressure; has one steam dome 36 inch diameter by 6 ft. 0 in. long, 172 tubes 3 in. x 9 ft. 4 in. long; two Adamson Joint furnaces and smoke box.

Steel Shipbuilders Engineers and Boilermakers

Dredges, - Hydraulic and
Dipper Type; Steel Steam-
ers, full Canal Size; Tugs,
Barges and Scows

Marine Engines and
Boilers, all Sizes

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto



MARTIN-SENOUR PAINTS AND VARNISHES



MADE IN CANADA

Marine Paint
Deck Paint
Hull Paint
Copper Paint
Seam Paint
Mast Paint
Dory Paint
Signal Paint
Smoke Stack Paint
Bunker Paint

The Martin-Senour line of Marine Paints and Varnishes is the most complete line manufactured in Canada.

There is a Martin-Senour finish for every purpose from stem to gudgeon. Each product guaranteed to best serve the purpose for which it is made.

Yacht Enamel
Engine Enamel
Canoe Enamel
Deck Furniture Enamel
Canvas Preservative
Railing Black
Ships Black
Durable Boat Spar Varnish
Boat Spar
Cabin Finish

Write for our Marine Catalogue and Color Chart

It's full of interest to the Marine Trade



The **MARTIN-SENOUR** Co.

LIMITED

PRODUCERS OF PAINTS AND VARNISHES

CHICAGO

MONTREAL

WINNIPEG

HALIFAX

LINCOLN

TORONTO



Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE—INTERCOLONIAL RAILWAY

Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

Montreal Locomotive Works, Limited

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

"NIAGARA TO THE SEA"



A Magic Chain of Delightful Scenes

Makes this famous 800 mile trip through America's greatest, and most interesting Waterway the Vacation Trip without parallel.

The service on our palatial steamers is unexcelled. The Falls of Niagara, the Thousand Islands, the Rapids of St. Lawrence, quaint old Quebec, Murray Bay, Tadousac and the Saguenay all these attractions combine to make an ideal vacation trip.

The Saguenay River with its wealth of scenic beauties—its exhilarating atmosphere—is a never-ending source of enjoyment. Shorter trips at proportionate rates.

WRITE for our beautifully illustrated booklet "Niagara to the Sea". It tells about a vacation trip every minute of which you will enjoy. Enclose 6c. to cover postage.

5-Day Tour to Montreal and return including meals and Berth **\$25.**

6-Day Tour to Quebec and return including meals and Berth **\$34.**

8-Day Tour to Chicoutimi and return including meals and Berth **\$47.**

15-Day Tour to Nova Scotia and return including meals and Berth..... **\$87.65**

Canada Steamship Lines, Limited

46 Yonge St., TORONTO
R. & O. Bldg., MONTREAL
or any Ticket Agent.



\$150.00 Per Mile of Track Saved

in one season by the New York
Central Lines with 24

"Imperial" Tie Tampers

taking power from 12 two stool
"Imperial" Gasoline Driven
Compressor Cars.

Two men with "Imperial" Tie Tampers will do as much work as six to ten men working in the old way.

Ask for full particulars.

Canadian Ingersoll-Rand Co., Limited

Commercial Union Bldg., MONTREAL, CANADA

Works: SHERBROOKE, QUE.

SYDNEY TORONTO COBALT TIMMINS WINNIPEG NELSON VANCOUVER

Cut Filing Costs in Half



Filing is like drilling. The moment the file wears smooth, it takes twice, or three times, the energy to accomplish the desired result. Engineers have got it down to a scientific basis in drilling. The moment a drill reaches its "inefficient point" it is discarded and this "efficient point" is determined by the amount of power used to drill a certain dimension.

Workmen are not machinery; consequently you have to depend upon

the personal element and educate your men up to the point where they will know at once when their files have reached the "inefficient point". If you can educate your men to do this you will get double the results at the bench, compared by results when men have been working with files that are inefficient.

The Famous Five are: Kearney & Foote, Great Western, American, Arcade, Globe
(MADE IN CANADA)

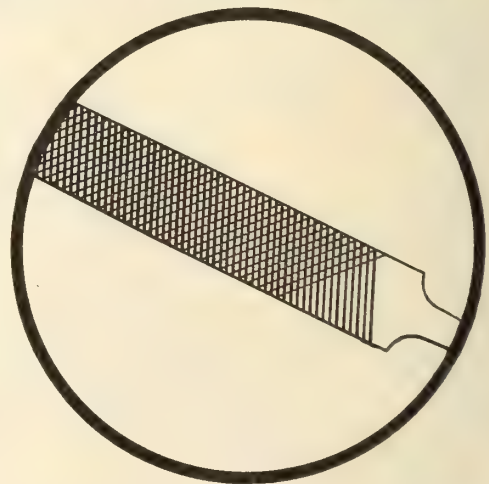
Write for our booklet "File Philosophy." It is well worth reading by any manufacturer, shop superintendent, shop foreman or workman who is concerned with the use of files.

Nicholson File Company

Port Hope

(Dealers Everywhere)

Ontario





WIRES and CABLES for STEAM and ELECTRIC RAILWAYS



THE fact that most of the steam and electric railroads in this country are using our products and continue from year to year to send in their repeat orders, is the best indication of what users think of Northern Electric quality.

No manufacturer pays more painstaking attention to the wire and cable requirements of the railroads; and the manufacturing and shipping facilities of our new Montreal plant are unsurpassed.

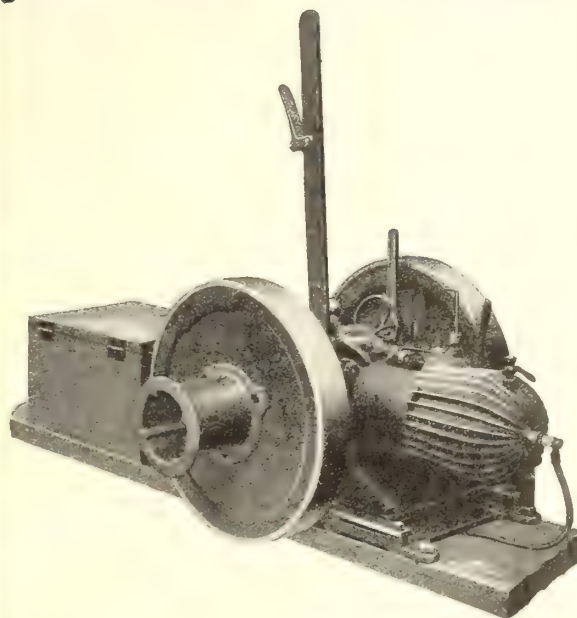
Here are some of the lines we make:—

- Railway Signal Wire, bare and rubber covered.
- Rubber-Covered Wire for round houses and repair shops.
- Asbestos Insulated Wire for Headlights.
- Reinforced Weatherproof Cables and Armored Cables for use in car shops.
- Magnet Wire for rewinding motors.
- Car Wire for electric light, fan, annunciator, motor and control circuits.
- Trolley Wire.
- Bare Weatherproof and Paper Insulated Feeder Cables.
- Bonding Cables.
- Paper-insulated, Lead-covered Telephone Cables and Bare Wires for Train Dispatching.
- Paper-insulated and Rubber-insulated Telegraph Cables.
- Armored Cables for bridge installations.



Northern Electric Company
LIMITED

MONTREAL HALIFAX TORONTO WINNIPEG
REGINA CALGARY VANCOUVER



The Air Cooled Jack Canuck Section Man's Engine

Fitted with Air Cooled Cylinder which materially reduces the weight and makes it absolutely reliable under all conditions of weather.

The Air Cooled Jack Canuck is a kerosene engine—a vital consideration with gasoline at the present high prices.

Terms liberal—\$10.00 with the order.
\$10.00 per month until paid for.

Write now for particulars.

**The
Canadian Fairbanks-Morse
Co., Limited**



MONTREAL, QUEBEC,
ST. JOHN, OTTAWA,
TORONTO, HAMILTON,
WINNIPEG, SASKATOON,
CALGARY, EDMONTON,
VANCOUVER, VICTORIA



Algoma Steel Corporation, Limited

Manufacturers of
Steel Rails, Splice Bars, Tie Plates, Forging Billets, etc.

We would be pleased to have your enquiries for 1916 deliveries.

Works and Sales Department: Sault Ste. Marie, Ontario, Canada

The Light of Day on the Right of Way

Headlights

Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

Car Lighting

Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency with economy. Standard cylinder supplies from one to two months' lighting of the average car.

Signals

Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

Commercial Acetylene Railway Light and Signal Company
103 BAY STREET, TORONTO

Main Office, 80 Broadway, New York

Branches, Atlanta, Boston, Chicago, San Francisco

American Flexible Staybolts

Manufactured in Montreal



Made of the best standard staybolt iron, adding flexibility by process of making as shown above---closely approximating a rope structure.

Write for booklet on subject.

TAYLOR & ARNOLD, Limited
MONTREAL WINNIPEG

Jas. W. Pyke & Company, Limited

Iron, Steel and Metal Merchants

Locomotive, Driving, Engine and Tender Truck Axles, Passenger, Freight, and Electric Tram Car Axles—To Standard or Railway's own Specification.

Staybolt and Engine Bolt Iron—Quality and Service Unexcelled.

Steel Plates—Firebox, Flange and Tank Qualities.

Structural Shapes—Beams, Channels, Angles, Tees, Zees, etc.

Steel Billets and Forgings—of all descriptions.

Locomotive Boiler and Superheater Tubes—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
232 St. James Street,

Montreal

A Land of Re-Creation

The SUMMERS from May to October in Eastern Canada are probably as enjoyable as those in the most favoured part of the world that may be chosen for comparison.

Sea-Shore, Forest and Stream

Sunny skies, delightful temperature, invigorating air, combined with an endless variety of picturesque beauty, the Maritime Provinces are becoming more and more what nature evidently intended they should be—a land of Re-Creation.

Write General Passenger Department

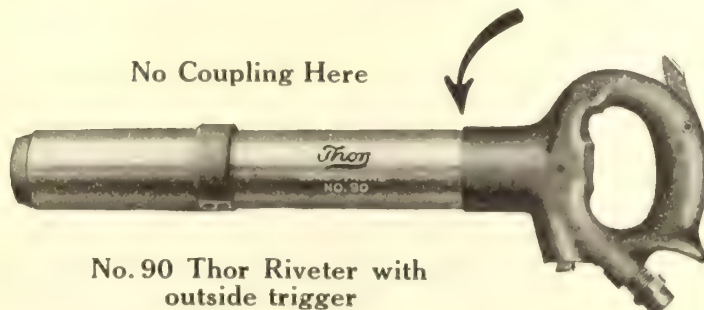
Canadian Government Railways

Moncton, N. B., for 1916 Publications

Thor

One Piece Pneumatic Long Stroke Riveting Hammer

No Coupling Here



Made from a solid drop forging with no connection between barrel and handle. Positively no leakage of air.

No. 90 Thor Riveter with outside trigger

Most powerful, durable and economical hammer on the market. Especially adapted for marine work. Used by most of the leading shipyards.

Furnished on Trial—FREE.

Independent Pneumatic Tool Company

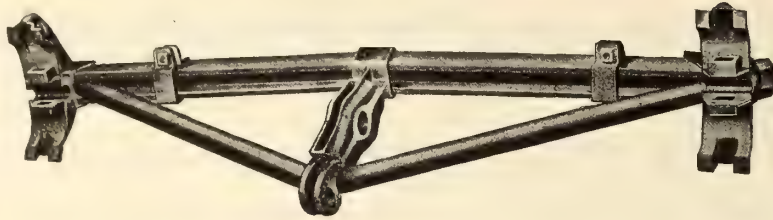
334 St. James St., Montreal, Que.

Buffalo Brake Beam Company

BUFFALO BEAMS ARE BEST BEAMS

Offices:

NEW YORK
30 Pine Street
ST. LOUIS
Syndicate Trust Bldg.
MONTREAL
195 Commissioner St.



Works:
BUFFALO,
N.Y.

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment



The Star Brass Works

Largest Exclusive Trolley Wheel Makers in the World.

Kalamazoo

Michigan



Canada Iron Foundries, Limited

Chilled Tread Cast Iron Car Wheels for All Services
Cast Iron Water, Gas and Culvert Pipe,
Flanged Pipe and Specials
Railway Castings

HEAD OFFICE:

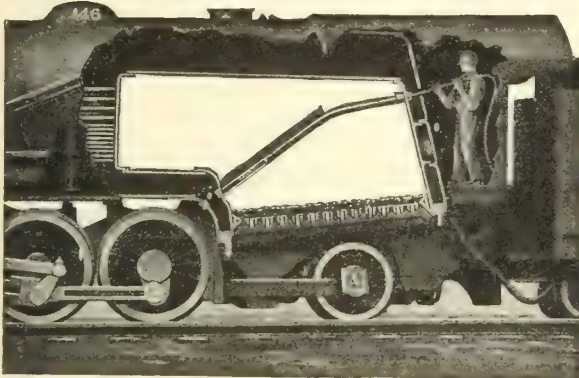
Mark Fisher Building

- - -

Montreal



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes.

Lagonda Arch Tube Cleaners

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

Other Lagonda Boiler Room Specialties are described in our General Catalogue L-8. Send for Copy.

Babcock and Wilcox, Limited

Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Building

The Parmelee Pipe Wrench



Price List C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	3/8, 1/2, 3/4, 1 in.	\$5.00	\$2.25	3/8, 1/2, 3/4, 1 in. \$.75
20 in.	2 1/2	3/4, 1, 1 1/4, 1 1/2, 2 in.	7.50	2.50	3/4, 1, 1 1/4 in. 1.00 1 1/2, 2 in. 1.25
25 in.	3 1/2	1 1/2, 2, 2 1/2, 3 in.	7.50	3.00	1 1/2, 2, 2 1/2, 3 in. 1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Limited

Toronto, Canada

"The Toothless Wonder"

Designed Especially to handle pipes spaced closely as in coil work. No. 2 1/2 wrench illustrated requires but three-quarter inch space between pipes.

Positive Grip instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

Ratchet-like Action. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

Can't Chew. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

Can't Crush. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.

"STERLING" Hack Saw Blades

are made to suit all requirements.
You will find them invaluable for your work.



You will find "Sterling"
Blades a satisfactory and economical investment.

Manufactured by
Diamond Saw & Stamping Works
BUFFALO, N.Y., U.S.A.



No. 74—DOUBLE ELLIPTIC SPRING
With Cast Ends

Railway Springs

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.
EQUALIZING, DRAWBAR, BUFFER AND SPIRAL SPRINGS of all kinds.

STREET RAILWAY SPRINGS, from the largest to the smallest.

TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE
SANDERS, CHAIN, Etc.

Manufactured by

B. J. Coghlin Company, Limited
Montreal, Canada

Dominion Iron & Steel Co., Limited

Manufacturers of

Basic Open Hearth Steel Rails

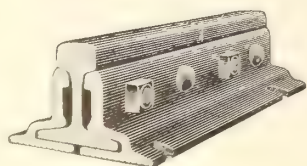
We will be pleased to have your enquiries for 1916 shipments

Head Offices
and Works

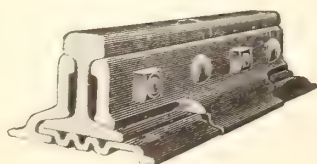
Sydney, Cape Breton, Canada

The Rail Joint Company of Canada, Limited

McGill Bldg., MONTREAL
36 Broad Street, London, E.C.



CONTINUOUS

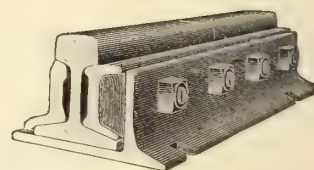


WOLHAUPTER

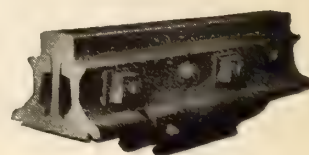
Continuous,
Weber, Wolhaupter and
100 p.c. Rail Joints.

Standard—Insulated
Step—Frog and Switch
Protected by Patents.

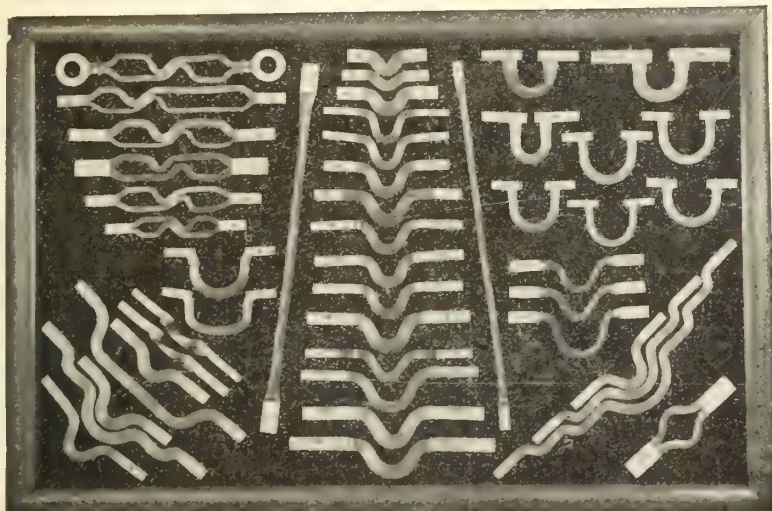
Grand Prize, San Francisco, 1915.



WEBER



100 p.c.



Electric Weld Rail Bonds

meet every condition.

Neither do they corrode at the terminals.

The Electric Railway Improvement Co.

Cleveland, Ohio

Car Ventilation

Expert Advice is as needful in this as in other matters of Car Construction. Is not the experience of twelve years, devoted exclusively to this field, worth anything to you? We have it, and it is yours for the asking.

CAR VENTILATORS of all types at prices from \$1.50 up.

For information address

Automatic Ventilator Company

No. 2 Rector Street

New York, N.Y.

The Columbia Hot-Shot Battery



A compact unit battery, developed to take the place of a number of individual dry cells.

Consists of a number of cells permanently connected—only two connections necessary to place this battery in service. No loose cells to handle, no chance for poor connections or broken circuits.

Contained in a moisture-proof fibre case, with a convenient handle.

Thousands of "Hot-Shots" are used by railroads everywhere. They are the ideal batteries for speeders and motor cars and all classes of ignition service.

Splendidly adapted for signal, telephone and telegraph service, and for any class of work where a number of cells would ordinarily be used.

Columbia Hot-Shot Batteries are made in different sizes and voltages, for every class of battery work.

If you are not already using the Columbia Hot-Shot Battery you are missing real battery economy.

Write for detailed information.

Canadian National Carbon Co., Limited

265 Adelaide Street West, Toronto, Ont.



This symbol is a guarantee of quality in rubber goods.

It represents the largest manufacturing concern of rubber goods in Canada, and in the British Empire.

It distinguishes the best **"Made in Canada"** line of rubber goods for railway or marine use.

It stands for the quickest service within your reach. Don't accept our statement for this fact. Put us to the test and see for yourself.

Our aim is to serve and please you and those you serve. Whatever the need in rubber may be, write to our nearest branch, or direct to our Head Office.

Canadian Consolidated Rubber Co., Limited
Montreal, P. Q.

28 "Service" Branches Throughout Canada.

Canadian Railway and Marine World

July, 1916.

The June Railway Mechanical Conventions at Atlantic City.

The two great railway mechanical conventions of the year, the Master Car Builders' Association and the American Railway Master Mechanics' Association, were held in Atlantic City, N. J., the former on June 14 to 16 and the latter on June 19 to 21. The most important features of these annual conventions are the reports of the standing and special committees, and the individual papers presented. The principal ones are given on this and following pages, either in full or in abstract.

Use of Powdered Fuel in Locomotives.

The American Railway Master Mechanics' Association committee, C. H. Hogan, Asst. Supt. Motive Power, New York Central Lines, East of Buffalo, chairman, reported as follows:—The use of powdered fuel in manufacturing plants has proved quite successful and has passed beyond the experimental stage. After years of experimental and development work, apparatus for the drying and pulverizing of coal has been perfected. The problems to be encountered in the use of powdered fuel in locomotives are more serious, on account of the necessity for storage of powdered fuel and the limited restrictions of space available on a locomotive. The first application of such a device for burning powdered fuel on a steam locomotive was made about a year ago, and special apparatus had to be designed, tested, improved and perfected to make it adaptable to locomotive practice, therefore discouragement should not be felt because in so short a time there are not a large number of locomotives in regular successful service burning powdered fuel.

None better than the members of this Association know the great difference in the burning of run-of-mine coal from different sections of this country, and even different mines in the same section; therefore they will readily appreciate at least that similar difficulties must be encountered and overcome in burning in powdered form the same coals containing various amounts of moisture, ash, etc., besides the added process of actually pulverizing the fuel. It is easily within the memory of all as to the difficulties at first experienced in the burning of oil in the limited confines of a locomotive fire box, and the apparatus used successfully; therefore today it would hardly be recognizable to the early designers and experimenters therein.

Perhaps most would agree today that but for the difficulty in obtaining fuel oil, and its excessive cost, the use thereof would be much greater than it is; nor is the end of increased cost of oil in sight, since methods have been devised for producing gasoline therefrom; hence it is believed that the perfection of apparatus for burning powdered fuel with equal advantage offers an acceptable substitute, and on account of the greater supply of

coal and its less cost, particularly the smaller sizes, many of which at present are entirely wasted, the field for the use of powdered fuel would appear to be much more extensive. The results to be obtained from successful use of pulverized fuel in locomotives may be briefly summarized as follows: Operation free from smoke, cinders and sparks; ready maintenance of fuel boiler pressure, increased boiler efficiency, decreased fuel cost, saving of manual labor in stoking, elimination of grates, as well as ash pit delays and expense.

The New York Central locomotive, being the first equipped for burning powdered fuel, has been used chiefly for the development and improvement of apparatus necessary for supplying powdered fuel to the fire box and in drafting the locomotive. This is a 10 wheel superheater engine, and has been used in helper and in freight service. Its leading features are as follows:—

Weight on drivers, 158,000 lb.
Tractive power, 31,000 lb.
Cylinders, 22 by 26 in.
Driving wheels, 69 in. diam.
Boiler pressure, 200 lb.
Grate area, 54 sq. ft.
Superheater heating surface, 540 sq. ft.
Total boiler heating surface, 3,188 sq. ft.

The Chicago & North Western locomotive, equipped less than a year ago, is Atlantic type, superheated, and of the following general description:

Weight on drivers, 96,000 lb.
Tractive power, 21,850 lb.
Cylinders, 20 by 26 in.
Driving wheels, 81 in. diam.
Boiler pressure, 185 lb.
Grate area, 46.3 sq. ft.
Superheater heating surface, 428 sq. ft.
Total boiler heating surface, 2,187 sq. ft.

This locomotive has been used in regular local and through passenger service, and a comparative test made with a duplicate locomotive burning coal on grates has thus far proved favorable to the powdered fuel, especially in saving fuel in firing up, movement at terminals, dead time, etc. This can readily be appreciated when it is recalled that on most locomotive coal tests it has been found that about 20% was used for work other than while pulling the train, or left in the fire box at the end of the run.

The Delaware & Hudson Co. has just received from the builders a consolidated locomotive equipped for the burning of powdered fuel, the following being a general description of same:—

Weight on drivers, 267,500 lb.
Tractive power, 61,400 lb.
Cylinders, 27 by 32 in.
Driving wheels, 63 in.
Boiler pressure, 195 lb.
Grate area, 99.8 sq. ft.
Superheater heating surface, 793 sq. ft.
Total boiler heating surface, 3,814 sq. ft.

It was hardly to be expected that your committee would be able to render at this time a comprehensive or conclusive report on the burning of pulverized fuel in locomotives, a matter so new to the art in locomotive practice; however, we wish it understood that not a little advancement has taken place in this very short period of time and submit the above merely as a report of progress and ask for the continuance of the committee.

Report of Committee on Car Construction.

The Master Car Builders' Association committee, W. F. Keisel, Jr., Asst. Mechanical Engineer, Pennsylvania Rd., Altoona, Pa., chairman, reported as follows: In the report made in June, 1915, a box car design was submitted and a request made that before Dec. 1, 1915, recommendations for changes and other criticisms, or approval of design, be sent to the chairman. Replies to this invitation were quite meagre, but indicated a desire on the part of railway companies to await the results of the development of the box car design which was under way by the American Railway Association subcommittee.

As members of your committee were also acting in an advisory capacity with the American Railway Association subcommittee it was deemed advisable to do nothing for the present in the development of the Master Car Builders' design of box car, but to assist, as far as possible, in perfecting the American Railway Association box car design in line with the work already accomplished on the proposed M. C. B. box car. In regard to this subject, we can only report progress. No other subjects were before your committee during the past year, as all of the items covered by our previous report, with the exception of one small item, were, by letter ballot, adopted by you as Recommended Practice.

The proper distance between centre sills of steel cars is one that will require serious consideration, as we should adopt either the present spacing generally in use, which is 12½ in., or determine on some other spacing that can be considered fixed for a number of years. The spacing of 12½ in. permits a car 40 ft. long to pass around a curve having 50 ft. radius without interference between the wheel flanges and centre sill flanges. It will readily be seen that if the distance between centre sills is increased, or if the distance between centres of trucks is increased, the radius of curvature around which car will pass will have to be greater. The distance between centre sills affects the work of the Coupler Committee and Draft Gear Committee, in addition to that of the Committee on Car Construction. We would recommend that the present spacing of 12½ in. be adopted as Recommended Practice, and that draft gear and couplers be made for this spacing of centre sills.

Dimensions for Flange and Screw Couplings for Injectors.

The American Railway Master Mechanics' Association committee, M. H. Haig, Mechanical Engineer, Atchison, Topeka and Santa Fe, chairman, reported as follows: The report of the committee presented before the 1915 convention, was referred back for further consideration. The original members of the committee were continued and the committee was

enlarged by the addition of two new members. After further and careful consideration, the committee confirms the report presented at the last convention.

Because of the difference in size of couplings and number of threads used by the several manufacturers, it is not possible to select a set of common standards which will interchange with all the individual standards of the several manufacturers. Realizing this, the committee selected a set of dimensions representing practices most common to the greatest number of railways and based its original report on these dimensions. There is no doubt that the proposed dimensions are thoroughly satisfactory in providing for mechanical strength and in meeting all injector conditions, for a large proportion of the roads are now using couplings conforming practically to the dimensions proposed. The principal differences between the proposed standards and the 10-thread couplings commonly used is in the shape of the thread, and the proposed shape was selected because of its interchanging most satisfactorily with all other shapes used.

It is not unusual for the principal manufacturers to make injectors to suit connections of different standards, and at least some, if not all of the manufacturers now have injector connections in service which will interchange with the proposed common standards.

It is not to be expected that manufacturers could immediately discontinue their individual standards in favor of a common standard or that the different railways would attempt to modify the couplings on present injectors to conform to a new common standard. It would be more natural to expect the gradual adoption of a common standard as new injectors are applied to locomotives under construction and to some lesser extent as old injectors are replaced by new ones during repairs. It is, therefore, a matter of the pleasure of the Association to decide whether a common standard should be adopted for flange and screw couplings for injectors. At the 1914 convention a motion was made to appoint a committee "with a view to preparing a standard and recommended practice." This committee has investigated the subject and has been guided in its recommendation by the information submitted by the railways. It has been the duty of the committee to analyze this information and place the facts before the Association, and the committee feels that it is now the office of the Association to decide whether it wishes a standard.

Settlement Prices for Reinforced Wooden Cars.

The Master Car Builders' Association committee, John McMullen, Mechanical Superintendent, Erie Rd., Meadville, Pa., chairman, reported as follows:—Your committee recommends that rules 115, 116 (except that part relating to trucks), 117 and 118 of the Code of 1915, be eliminated, and that new rules be substituted therefor, covering the settlement for cars destroyed on foreign lines.

Your committee further recommends the following in connection with determination of prices and depreciation:

(a) The original cost of a unit of equipment, inclusive of body, trucks and air brakes, shall be used as the basis for settlement, from which will be deducted depreciation figured from the date of the original cost to the date of destruction. If, however, betterments have been added during the life of the car, and added to

the book cost, depreciation on such betterments shall be figured from the date when made and deducted from the cost of such betterments. The total of the depreciated first cost and of the depreciated betterment cost will be the amount to be paid in settlement for the destroyed car.

(b) A car will be considered as new when written out of service and rebuilt, when the cost of renewals (repairs, renewals or betterments made at the same time) constitutes the major portion of its value as renewed, and settlement will be made as in the case of a new car. In no case shall the charge for the rebuilt car exceed the cost at current market prices for labor and material of new equipment of similar type, equal capacity and equal expectation of life in service, less a suitable allowance on account of the second-hand parts remaining therein.

(c) In order to provide uniform rates of depreciation for the settlement of cars destroyed on foreign roads, your committee would recommend the following:

Wooden cars, all classes, except refrigerator cars 5 per cent.

All-steel cars, all classes, including steel tanks of tank cars 3 per cent.
Wooden cars, steel-framed or steel-underframed, or both 4 per cent.
Refrigerator cars, all wood 7 per cent.
Refrigerator cars, steel-framed or steel-underframed, or both 6 per cent.

The above rates are to be applied on the so-called straight depreciation basis. For example, the depreciation on a wooden car, 10 years old, at the rate given above (5%), which cost originally \$1,000, would be \$500. These rates apply to body, trucks and air brakes; but depreciation shall in no case exceed 80% of the value upon which it is based.

(d) In order to provide for settlements for trucks, when trucks only are destroyed, prices headed "Trucks," rule 116, page 204, 1915 Code of Rules, and paragraphs of the rule following the table, should be retained. Depreciation to be figured at the rate established for the type of car the trucks were under when destroyed.

(e) Rules 112, 114 and 120 to be rewritten by the arbitration committee to conform to the recommendation in this report.

Report of Committee on Mechanical Stokers.

The American Railway Master Mechanics' Association committee, A. Kearney, Assistant Superintendent, Motive Power, Norfolk & Western Ry., chairman, reported as follows:—Your committee a year ago shared the opinion of your executives that it would be interesting and none the less valuable if further data could be secured (preferably on a laboratory test plant) to show the relative efficiency of at least the prominent types of locomotive stokers, using the different grades of fuel under the usual range of operation; at the same time they fully realized that to make the work complete a great deal of time and labor would be necessary—perhaps much more than any railway officer not having a plant could afford to spare. Your committee has given this matter a great deal of thought without being able to determine as yet where and how the work could be undertaken, but further than that they feel confident that even if the opportunity presented itself it would be better and very much more satisfactory in the end to postpone the work until the machines more nearly approach standard designs.

Relative fuel consumption and cost figures would, of course, be pertinent, but as the records already obtained in connection with the general performance of stokers under service conditions (a good deal of which has found its way into print), is not only complete but comprehensive, embracing considerable information upon the efficiency as affected by the use of many of the grades of coal commonly offered for fuel purposes, some tests being conducted to show fuels especially prepared with respect to their condition—a factor of considerable importance—and figures pertaining to the cost of maintenance and durability being available, your committee, after taking all things into consideration at this time, does not deem it expedient to advocate going to the expense of getting figures for any of the machines in their present transitory stages, especially since so many of the extensive improvements now under way may materially alter their standing for accurate comparative purposes.

Furthermore, the stoker field is gradually narrowing itself down to a few types. Those that have withstood the storm and continue to show merit are

practically embraced in the Street, Hanna, Standard and Crawford machines; at the same time even these machines are undergoing alterations for higher efficiency and greater range of adaptability, though not necessarily departing from the general principles upon which the machines were originally laid down. The first three machines, the Street, Hanna and Standard, belong to the scatter or overfed group, while the Crawford is the only distinctly underfeed machine in the field.

As time and opportunity have shown wonderful advances in nearly every known device, it is safe to assert confidently that the full development of the mechanical stoker has not yet been reached. At the same time some of the original designs of the four prominent types mentioned have been in service some four or five years, or longer, and are still doing good work. As of April 1, 1916, the following number of machines of the four named types were in service and on order:

	In service April 1, 1916	On order April 1, 1916
Street	866	152
Crawford	413	63
Hanna	39	39
Standard	100	125
Total	1418	379

In order to show the headway made in stoker designs and improvements during the past four years records of those in service have been prepared as shown in tabulation. The figures are interesting as they show how the number of machines in service has increased by years to date. The following table shows the total of all mechanical stokers in service as of April 1, 1916. As mentioned in your committee's last year's report there are other machines in service undergoing trial, still others in contemplation, but your committee has been advised of none beyond those alluded to in their last report.

Year.	Street.	Crawford.	Hanna.	Standard.	Ttl.
1910	5	1	..	..	6
1911	10	1	1	..	12
1912	165	46	1	..	212
1913	173	153	2	..	328
1914	418	301	3	2	724
1915	531	301	18	22	872
1916	866	413	39	100	1418

The practicability of the stoker, as well as its range of value and adaptability, depending upon local conditions of opera-

tion, is no longer a matter of conjecture, as standard designs are to be found on the market which are being applied in fairly large orders, as the records show. Still, the manufacturers are working zealously and satisfactorily for higher merit.

Generally speaking, the progress in the stoker designs during the past year has been quite encouraging. Since our last report the Locomotive Stoker Co. has brought out its duplex machine, which has for its object the conservation and efficient utilization of a greater amount of the finer produce in the fuel heretofore subject to more or less loss with any of the scatter type machines.

Much time is being devoted to the study of pushing coal through open and closed ducts and troughs, to ascertain the range of possibility and necessary mechanical conditions, also the effect of grinding and further pulverizing the fuel in its passage from the tank to the fire box through the helicoid screw in the horizontal or vertical planes, as well as the general effect through the pressure zones, the fruits of which it must be realized can only be obtained as developments are carried forward.

The Street Co.'s regular type C stoker, like other machines on the market, continues to do excellent work, and is showing improvement in durability. The Street Co. has recently designed and constructed two machines of a type known as the duplex, one of which has been applied to a Mallet locomotive on the Norfolk & Western, and the other to a locomotive of a similar type on the C. & O. R. The Hanna and Standard companies have both been pushing with much earnestness the introduction of a number of detail improvements in their machines for greater durability of parts, as well as higher efficiency in their operating engine and controlling mechanism, none of which, however, materially alters the original principle upon which the machines are constructed. All of this work requires a great deal of time and experimenting. We are informed that many improvements in detail have been made in the Crawford stoker which forecast substantial progress, efficiency in operation, and lower cost in maintenance.

Your committee, cognizant of what has been done and what is in contemplation, deems it premature at this time to attempt any elaborate efficiency tests, but suggests that the work be deferred until designs and improvements become more permanent, especially since data necessary for all practical purposes have either been reported or are readily obtainable by those who may be seriously considering their use. Furthermore, by the time the present machines reach a more favorable stage for a comparative test the opportunity for such an investigation, which at best is going to be very expensive and require a great deal of time, may be more opportune than at present.

Report of Committee on Car Trucks.

The Master Car Builders' Association committee, J. T. Wallis, General Superintendent Motive Power, Pennsylvania Rd., chairman, and of which L. C. Ord, formerly Assistant Works Manager, Car Shops, C. P. R., Montreal, who is now on active military service, was a member, reported as follows:—On account of the American Railway Association committee on design of standard box car having under consideration some minor changes in the design of truck bolsters, involving

probable slight changes in the limiting dimensions of cast steel truck sides, your committee deems it advisable to await the final conclusions of that committee before recommending any changes in the present Recommended Practices.

The committee on brake shoe and brake beam equipment submitted to the car truck committee a proposed design of brake beam hanger and manner of fastening to truck which received the approval of the car truck committee, inasmuch as the hanger conformed in length and location to the limiting dimensions for cast steel truck sides, now a Recommended Practice of the Association. Subsequent to this, criticisms have been made of the manner of securing the

brake beam hanger to the truck and of the design of the hanger, involving changes in the hanger where it enters the brake head and modifications of the hanger hole in the brake head. Your committee, therefore, recommends that the design of brake hanger and its fastening to the truck be held over until next year, when the question of truck design for standard box car will be settled by the American Railway Association standard box car committee, and when this is concluded the committee on car trucks will confer further with the committee on brake shoe and brake beam equipment on desirable changes in the tentative design of the brake beam hanger and its fastening to the truck.

Report of Committee on Superheater Locomotives.

The American Railway Master Mechanics' Association committee, W. J. Toller-ton, General Mechanical Superintendent, Chicago, Rock Island and Pacific Rd., chairman, reported as follows:—As of Jan. 1, 1916, there were 15,666 superheater locomotives in service in the United States and Canada, practically all of the fire-tube type, as follows:

Superheaters applied at time of construction of locomotive	9,900
Superheaters applied to locomotives already in service	5,766
	15,666

With the exception of one prominent railway, very few locomotives, originally equipped with slide valves, have been changed to piston valve and had superheaters applied. With the exception of 142 Mallet locomotives, equipped with superheaters, having slide valves on the low pressure cylinders, very few superheater locomotives are equipped with slide valves. The railways on which these Mallet locomotives are operating is experimenting with a view of applying piston valves. Therefore, your committee does not feel this subject can be thoroughly discussed at this time.

Of the railway reporting, 99% of the superheater locomotives were equipped with brick arches. The use of brick arches is specially recommended on superheater locomotives, where practicable, as it causes more perfect combustion, better distribution of heat in the fire box, protects the flues and sheets and effects a reduction in smoke and sparks and cinders in flues and front end. In extreme bad water districts, the application of arches should be determined by local conditions.

It is recommended that a programme be adopted for the application of superheaters to existing power on a monthly schedule. This will enable the railways to place orders in advance for the necessary material and thereby avoid delay to locomotives undergoing repairs, awaiting superheater material.

There is a decided difference of opinion as to the advisability of equipping switching locomotives with superheaters, as follows:—Some railways maintain the same relative economies are effected through superheating switching locomotives as are obtained by superheating road locomotives. Others will not give consideration to superheating switching locomotives until all available road locomotives have been equipped, owing to the greater returns to be obtained. Your committee commends the application of superheaters to switching locomotives, but considers their application to road locomotives as being generally of greater importance.

It is felt no set rule can be formulated covering the application of superheaters to existing locomotives, as age, general condition, capacity and further service to be secured must govern. Several railways reported having superheated locomotives 10 to 15 years old.

From replies received, it is apparent that the superheater will be specified on all road and many switching locomotives purchased in the future.

The return tube, top header, double loop superheater is the type most generally used.

In view of the many complete reports which have already been rendered on tests covering the economies effected through the application of superheater, and superheater and brick arch, your committee does not believe it necessary to publish further data in this report. However, on a conservative basis, it is felt that an economy of 15 to 25% in fuel and 20 to 30% in water consumption can be expected in every-day operation through use of the superheater and brick arch. Numerous tests have shown greater economies. On a number of railways the application of superheaters has reduced the time of freight trains on the road 10 to 15% and eliminated one stop for coal and two stops for water over one freight engine division.

It is generally felt by all, and proved by some careful comparative tests, that the cost of repairs (maintenance of equipment) is greater for locomotives equipped with the superheater and brick arch. However, for the railways as a whole, the reductions effected in the cost of coal and water and the increased general efficiency (conducting transportation), offset this many times over.

As a general proposition, no changes are necessary in the front end arrangement, due to the application of superheater, aside from those made an account of superheater elements, header and damper. Replies received indicate no great variation in the size of exhaust nozzle tip between saturated and superheated locomotives of the same general characteristics.

The committee feels that the best results will be obtained in operating superheater locomotives by carrying about two gauges of water, with full throttle on short cut-offs, so far as operating conditions will permit. The engineers should also be required to crack the throttle when drifting.

The investigation develops that the majority of superheater locomotives are equipped with hydrostatic lubricators without booster, although a considerable number of railways are using the hydrostatic lubricator with the booster attach-

ment. The booster is of value if the hydrostatic lubricator has a restricted equalizing passage. If the hydrostatic lubricator is designed with the proper size equalizing passage, the booster attachment is unnecessary, as its principal function is to compensate for the restricting equalizing passage. The use of the force feed lubricator is very limited, but a number of railroads are experimenting with this type at the present time. The use of an independent feed for lubricating the cylinders is limited. It is the opinion of your committee that this is unnecessary and should be discontinued, as it is very questionable if any benefits are being derived therefrom.

The majority of railways are now using a superheat oil for the lubrication of superheater locomotives, stating that it does not carbonize and better results are obtained. It generally has been necessary to increase the valve oil allowance 20 to 25% for the superheater locomotives over the allowance for saturated locomotives of similar type and size. However, this does not apply in the same proportions to bad water districts, where superheating has reduced the foaming and eliminated water being carried over into the cylinder, in which cases no increase in oil allowance has been necessary.

Various methods have been tried for the use of graphite on superheater locomotives, but the replies received indicate the majority are not using graphite for lubricating superheater locomotives.

Trouble has been experienced with carbonization of oil in valve spools, and piston heads, this has been remedied by decreasing the amount of oxygen drawn into the cylinder, by drifting with a partially open throttle or drifting valve. The use of superheat oil will also decrease the trouble.

The application of superheaters to locomotives equipped with slide valves has been so limited, the committee does not feel warranted in discussing the system of lubrication for that type of locomotive at this time.

Vacuum relief valves are generally used, although there is some question as to what benefit, if any, results. The majority of replies received indicate that the by-pass valve is not in general use on superheater locomotives. These have only been advocated for large cylindered locomotives, to take care of the high compression in the cylinders.

A number of railways are now using, and others are experimenting with, drifting valves, either manually or automatically operated. When drifting is done with the throttle valve, on superheated locomotives, superheated steam is used. When drifting valve is used, either manually or automatically operated, saturated steam is used. Generally, no distinction is made as to size of drifting valve or steam connections between large and small locomotives in passenger and freight service, and for the sake of standardization such practice is desirable. When locomotives are not equipped with by-pass, automatic or manually operated drifting valve, or other drifting valve in the cab, the throttle should be cracked while drifting a sufficient amount to prevent the admission of air. This will decrease carbonization.

Very little experimenting has been done in the application of pyrometers to locomotives, outside of special tests, but the committee believes it is desirable to make tests from time to time to ascertain the degree of efficiency being obtained. In view of the initial cost, it is felt that

portable instruments would answer the requirements, a certain number for each division, to be transferred from one locomotive to another. The pyrometers should be adjusted at regular intervals, in order to obtain accurate readings.

Some difficulty has been experienced due to superheater headers cracking, units leaking and packing melting. As a general proposition, however, the trouble has not been serious from these sources. There are no comparable data available as regards locomotive failures as between superheated and saturated locomotives. Better design or foundry practice is recommended as a remedy for the trouble with the headers and better workmanship for the units. The standard set of tools as recommended by the superheater manufacturers is recommended for adoption as standard for the care and maintenance of superheaters. At present there are a number of railways which have no printed instructions for round-house forces, back shop employees and enginemen on the operation and maintenance of superheater locomotives. In order that the greatest efficiency may be obtained, it is very necessary that all employees be fully conversant with these features. For the guidance of round-house and back shop employees, a standard practice card, embodying the instructions as recommended by the superheater manufacturers, should be issued.

A number of railways are welding all flues in the back flue sheet successfully, the welding being done with the ordinary types of welding equipment.

With the exception of one prominent railway, all railways reporting are using superheater dampers in the front end satisfactorily.

The investigation develops that a number of railways have had more cracked cylinders and saddles with superheater locomotives. They have now adopted outside steam pipes, which involved change in design of cylinders, on superheater locomotives.

Welding of Cast Steel Truck Side Frames and Bolsters.

The Master Car Builders' Association committee, W. O. Thompson, Superintendent, Rolling Stock, New York Central Lines, East of Buffalo, chairman, reported as follows:—Your committee desires to submit the following recommendations, one member of the committee dissenting.

Cast steel truck side frames must not be welded if cracks extend more than 1 in. from edge of any rib or flange.

Cast steel truck bolsters must not be welded if cracks extend more than 1½ in. from edge of rib or flange, unless bolster is reinforced at place of failure by addition of plates, either welded or riveted, to bolster.

J. T. Wallis, General Superintendent of Motive Power Pennsylvania Rd., Altoona, Pa., presented the following minority report:—I cannot concur in the report of the majority of the committee permitting welding of cast steel truck side frames and bolsters, as I consider the practice of welding cracks in these members, by either acetylene, electric or any other present known methods, unsafe, for the reason that the fractures indicate weakness in design, and the welding will not add to the strength, but introduces a condition of further weakness by improper workmanship. It is a well known fact that a large number of cast steel truck side frames and bolsters, especially the former, are failing as a result of

weakness in design. Where the proper sections are used, and the design proved, these cracks do not appear. I cannot, therefore, subscribe to a practice of continuing in service such vital parts of car construction which, as evidence by fracturing, are inherently weak, or to a method of repairs which in no way strengthens the part, but, on the contrary, introduces another chance for failure, and consequently is unsafe.

Report of Committee on Safety Appliances.

The Master Car Builders' Association committee, D. R. MacBain, Superintendent Motive Power, New York Central Rd., Cleveland, Ohio, chairman, reported as follows:—From the title of this committee about the only matter that can be reported on is the progress that is being made in the equipment of freight cars with safety appliances to comply with the law, and your committee is pleased to state that in a general way, notwithstanding the strenuous conditions with which railways have had to contend, fairly satisfactory progress has been made in our efforts to comply with the requirements of the law. From information received from railways operating 2,505,159 freight cars, of which, according to reports, 1,905,929 were put in service prior to July 1, 1911, between the periods July 1, 1911, and Dec. 31, 1915 (the latest data available), 1,303,906 cars built prior to July 1, 1911, have been equipped with safety appliances, or an average of 289,757 cars per year. The actual total each year has been as follows:

Half year ended Dec. 31, 1911.....	37,667
Year ended Dec. 31, 1912	223,137
Year ended Dec. 31, 1913	331,846
Year ended Dec. 31, 1914	338,321
Year ended Dec. 31, 1915	372,935
	1,303,906

Of cars built prior to July 1, 1911, there remained to be equipped on Dec. 31, 1915, 681,571 cars. To complete the equipment of these cars by the time set by the Interstate Commerce Commission will require a great deal of effort on the part of the railways, especially in view of the difficulty of getting the cars home from foreign roads and the procurement of materials with which to do the work. In order to expedite the movement of cars home for this purpose, the Arbitration Committee has proposed, with the approval of the Executive Committee, the incorporation in rule 4 of the following: "After Jan. 1, 1917, no car will be received from owner unless properly equipped with U. S. Safety Appliances or U. S. Safety Appliances Standard."

The committee feels that this matter should be given the closest attention possible, that there should be co-operation on the part of the railways to the end that on July 1, 1917, we may say to the Interstate Commerce Commission that practically all of the cars in the country have been equipped in accordance with the requirements of the law.

Air Brake Association.—The following officers were elected for the current year at the recent convention at Atlanta, Ga.: President, T. W. Dow, Erie; First Vice President, C. H. Weaver, N.Y.C. west of Buffalo; Second Vice President, C. W. Martin, Pennsylvania; Third Vice President, F. J. Barry, New York, Ontario and Western; Secretary, F. M. Nellis, Pittsburgh, Pa., and Treasurer, O. Best, New York.

The Best Design and Materials for Pistons, Valves, Rings and Bushings.

The American Railway Master Mechanics' Association Committee, Joseph Chidley, Assistant Superintendent of Motive Power, New York Central Rd., Lines West of Buffalo, chairman, reported as follows: Your committee was requested by the secretary to cover the subject of extension piston rods and also the matter of lubrication, in accordance with action taken by the Executive Committee. The committee has not attempted to cover the matter of lubrication, on account of this subject being covered quite thoroughly by the report issued by the Superheater Committee. The committee issued a cir-

tained depends not only on the material and design, but also on the efficiency of lubrication, the class of service and maintenance. A road traversing level country should obtain more mileage from the different parts than could be obtained by a mountain railway. This is equally true of roads traversing bad water districts, compared with those in good water districts. A road on which much drifting is done will obtain more mileage if its locomotives are equipped with automatic drifting and by-pass device. The service for which heavy, modern types of locomotives are used is generally more severe

Piston Valve Bushings.—Of the 34 roads reporting, 8 use cast iron for piston valve bushings on superheater locomotives and 26 use Hunt-Spiller gun iron. Cast iron is used on saturated locomotives by 17 roads, Hunt-Spiller gun iron is used by 10 roads and 7 roads have no saturated locomotives with piston valves. Short bushings are used by 26 roads, while 6 roads favor long bushings, extending across the exhaust passages to the steam-chest cover.

The number of roads using an even number of ports is about the same as those using an odd number. Apparently

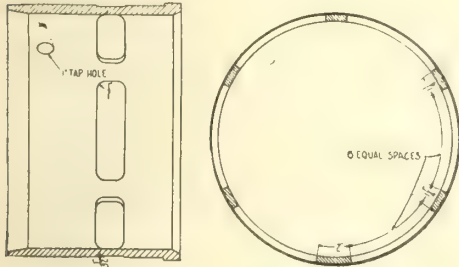


Fig. 1. Piston Valve Bushing.

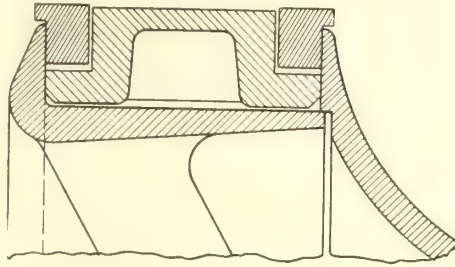


Fig. 2. Piston Valve L Ring

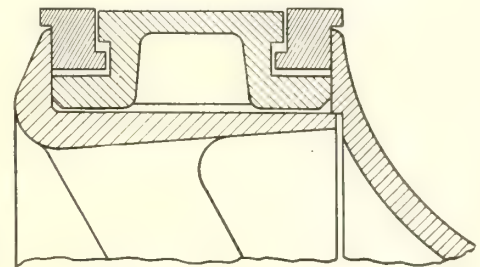


Fig. 3. Piston Valve Z Ring.

cular of inquiry to members with regard to the materials and designs used by the various railways for pistons, valves, rings and bushings, with a view of ascertaining the prevailing standards of material and design. This was also intended to bring out the changes, if any, which have been necessitated by the very general change from the use of saturated steam to superheated steam in the last few years. The committee has received replies from 34 railways, representing about 37,000 locomotives. In general, we may say that most roads make no distinction between saturated and superheater locomotives in the design of pistons, valves, rings and bushings, on locomotives equipped with piston valves. Many railways are using Hunt-Spiller gun iron for pistons, valves, rings and bushings for both superheater

than that of older and lighter types, which would be expected to give more mileage, other things being equal. The replies received by the committee indicate the difficulty of making a comparison between the service of the various parts on superheater and saturated locomotives. Most modern locomotives are equipped with superheaters, while the saturated type of locomotives is represented for the most part by a lighter class of locomotives, built, as a rule, a number of years ago, and not to be classed as types of modern locomotive construction. Several roads state that they find no difference in the mileage of the various parts under discussion on superheater and saturated engines, others obtain more mileage with the saturated locomotives, and a few report more mile-

not much attention has been paid to this feature of the design, although several roads are now changing from an odd to an even number of ports, which seems to be the preferable design. The object in having an even number is to have the bridges come near enough to being opposite each other so that the bushings can be readily calipered over the bridges to measure the amount of wear. The minimum width of bridges varies from 17-32 in. to 1¼ in. The committee favors a small number of bridges, with sufficient metal in them to give the necessary strength to the bushing. The usual form of steam ports is rectangular, although several roads report the use of diagonal bridges, forming diamond shaped ports. The committee has no evidence as to the advantages or disadvantages of this style

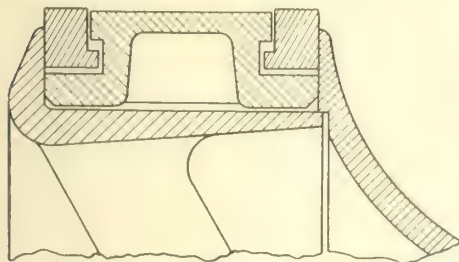


Fig. 4. Piston Valve Anchor Ring.

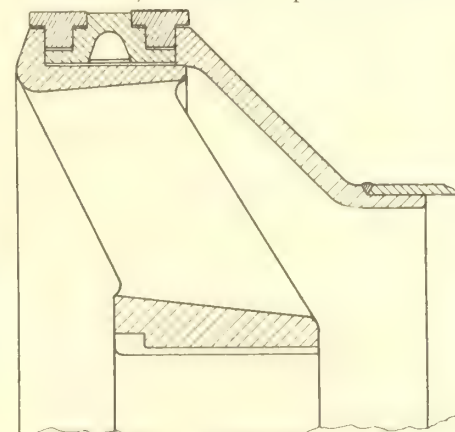


Fig. 5. Piston Valve T Ring

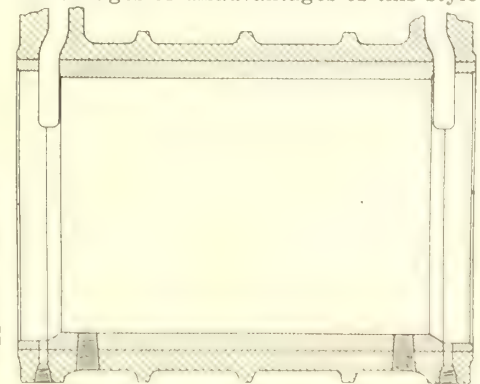


Fig. 6. Cylinder Bushing.

and saturated locomotives, while a smaller number use ordinary cast iron for the purpose; a number of roads use Hunt-Spiller iron for superheater locomotives and ordinary cast iron for saturated locomotives. Throughout this report the words "Hunt-Spiller," or the letters "H.-S.," denote Hunt-Spiller gun iron, and the words "Cast Iron," or the letters "C. I.," denote other varieties of cast iron.

The committee asked for data regarding the mileage obtained for different designs and materials in passenger and freight service on superheater and saturated locomotives. Mileage figures were submitted by something less than half of the roads reporting. The variation in mileage is so great, according to the replies received, that the committee hesitated to draw any conclusions from considerations of mileage. The mileage ob-

age with superheater locomotives. By the term "mileage," as used in this report, we refer in all cases to the mileage obtained between renewals for the parts under discussion. It is worthy of notice that of the 34 railways replying to the circular, some use Hunt-Spiller gun iron, some merely state that they use cast iron, others use a special grade of cast iron, some roads giving their own specifications for cast iron, and none state that they follow the specifications of the A.R.M.M.A., which were adopted in 1906 and revised in 1915.

of port. Sixteen roads use a fillet in all corners of ports in piston valve bushings, and 15 provide no fillet in the corners of the ports, or provide fillets only on the exhaust edge of the steam ports.

The committee asked the members to report on the mileage between renewals of piston valve bushings, but it is evident from a consideration of the replies that in some cases mileage is given between borings. The largest mileage reported between renewals on superheater locomotives is 300,000 miles, obtained in both freight and passenger service on one of the standard trunk roads with the use of short Hunt-Spiller gun-iron bushings. The maximum mileage reported between

renewals on saturated engines is reported by the same road as being 360,000 miles in both passenger and freight service, using short Hunt-Spiller gun-iron bushings. The committee recommends the use of short piston valve bushings with an even number of ports and bridges, and with a small number of ports and bridges, not more than eight, and preferably six in number. The committee also recommends the use of a fillet in all corners of piston valve bushing ports. A $\frac{1}{2}$ -in. radius is recommended as the standard size of fillet. Rectangular ports are to be preferred to diagonal bridges and diamond shaped ports, in view of the

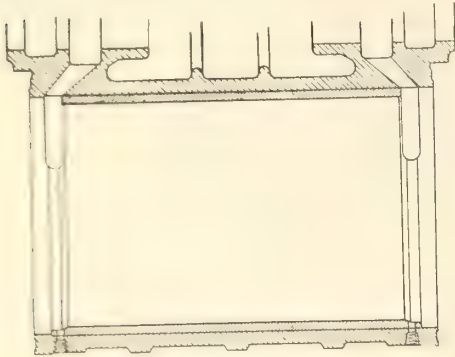


Fig. 7. Cylinder Bushing.

practice of the majority of the members. Fig. 1 is an illustration of what the committee considers the best general design of piston valve bushing. The bushing is to be forced in, and the bridges are turned 1-32 in. smaller diameter on outside than the rest of the bushing, in order to allow the bushing to be forced into position without cracking or burring the edges of the ports.

Piston Valve Packing Rings.—Cast iron is used for piston valve packing rings on superheater locomotives by 5 of the 34 roads reporting; Hunt-Spiller is used by 27 roads; bronze is used by one road, and one road does not state. Cast iron is used on saturated locomotives by

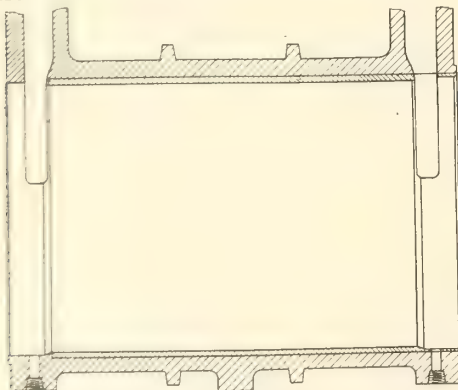


Fig. 8. Cylinder Bushing.

13 roads, and Hunt-Spiller is used by 14 roads. The committee has information from one road using bronze piston valve packing rings, indicating there may be a field for further experiment.

Figures for the mileage obtained by the use of different materials and designs were submitted by 16 roads. Although these figures vary widely among themselves, we have taken the average figures as representing the results obtained in the United States and Canada. These average figures are here given, together with the maximum figures received, and similar figures for the roads using cast iron and those using Hunt-Spiller.

Mileage of Piston Valve Packing Rings—Average of replies from 16 roads:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	60 000	100 000	90 000	100 000
Average	30 900	40 000	34 200	43 500

Mileage of Cast-iron Piston Valve Packing Rings.—Replies from 4 roads using C. I. for superheater locomotives and 6 roads using C. I. for saturated locomotives:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	27 500	34 750	30 000	49 800
Average	16 400	23 200	20 300	33 200

Mileage of Hunt-Spiller Piston Valve Packing Rings.—Replies from 10 roads using H.-S. for superheater locomotives and 6 roads using H.-S. for saturated locomotives:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	60 000	100 000	90 000	100 000
Average	35 900	50 800	48 300	53 800

ures for the roads using cast iron and those using Hunt-Spiller.

Mileage of Piston Valve Bull Rings—Average of replies from 13 roads:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	150 000	200 000	120 000	165 000
Average	73 400	102 700	69 200	92 400

Mileage of Cast-iron Piston Valve Bull Rings.—Replies from 9 roads using C. I. for superheater locomotives and 7 roads using C. I. for saturated locomotives:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	150 000	120 000	120 000	165 000
Average	72 000	78 500	64 700	93 100

Mileage of Hunt-Spiller Piston Valve Bull Rings.—Replies from 4 roads using H.-S. for superheater locomotives and 2 roads using H.-S. for saturated locomotives:

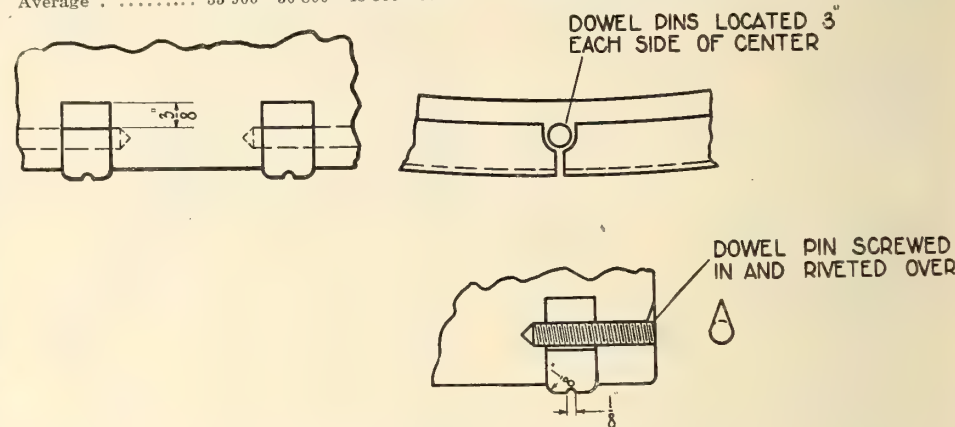


Fig. 9. Piston Packing Rings.

These figures indicate that better results are obtained by the use of Hunt-Spiller gun iron for piston valve packing rings than is obtained by the use of other varieties of cast iron.

The arrangement of piston valve bull ring and packing rings in most common use is shown in fig. 2. This shows the old familiar L ring, which is used by the greatest number of the roads reporting. Several roads also use the Z ring and anchored ring, shown in figs. 3 and 4, respectively. Two large roads use a T ring, as shown in fig. 5. Several roads use the standard designs of the American

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	135 000	200 000	90 000	100 000
Average	76 500	145 000	85 000	90 000

Fig. 2 shows the bull ring used in connection with the L type packing ring, and is considered the best design by the committee. Figs. 3, 4 and 5 show other styles of bull rings used with Z rings, anchored rings and T rings.

Cylinder Bushings.—Cast iron is used for cylinder bushings on superheater locomotives by 10 of the 34 roads reporting. Hunt-Spiller is used by 24. One of these roads uses Hunt-Spiller for passenger locomotives and steeled cast iron for



Fig. 10. Piston Packing Rings.

Balanced Valve Co. The data are not available to make a comparison of the various designs upon a mileage basis. The Z ring and anchored ring have the advantage that if broken they are held in place by their shape, but in view of the successful use of the L ring, shown in fig. 2, by the majority of the roads reporting, the committee believes this to be the best design of piston valve packing ring.

Piston Valve Bull Rings.—Cast iron is used for piston valve bull rings on superheater locomotives by 22 roads out of the 34 reporting; Hunt-Spiller gun iron is used by 10; cast steel is used by one, and one does not state. Cast iron is used on saturated locomotives by 21 roads, and Hunt-Spiller is used by 6. Figures for the mileage obtained on piston valve bull rings were submitted by 13 roads. We give below the maximum and average of all the replies received, and similar fig-

freight locomotives. Cast iron is used on saturated locomotives by 20 roads; Hunt-Spiller is used by 12, and 2 do not state. The replies were very meagre and incomplete with regard to mileage, only 9 roads giving any figures. A number of the figures received are obviously mileage between borings instead of mileage between renewals, as asked for in the circular.

The thickness of cylinder bushings as shown on the drawings submitted, varies from $\frac{5}{8}$ in. to $1\frac{1}{2}$ in. Fig. 6 shows a design of cylinder bushing that is in quite general use. This is a straight bushing extending from the front cylinder head to the back cylinder head. The steam opening at each end may consist of a single opening, as shown, or may have one or two bridges. Fig. 7 shows a design of cylinder bushing used by several roads. This is a straight bushing, with the ends cut away at the top to provide

steam passages. This bushing is placed in position from the front, and is held in position at the back end by a shoulder in the cylinder casting. Fig. 8 shows another style of straight cylinder bushing, terminating at the inside of the port at the back end. The straight bushing seems to be preferred by most of the members, only one road reporting the use of a bushing with a shoulder. One road uses a bushing made in two sections, each section being pressed in from the cylinder ends. The committee has no knowledge of the advantage of this arrangement. All the bushings illustrated are considered good, but in the opinion of the committee the simplest and best is shown in fig. 7.

Piston Packing Rings.—Cast iron is used for piston packing rings on superheater locomotives by 6 of the 34 roads reporting, and Hunt-Spiller is used by 28. Cast iron is used on saturated locomotives by 18, and Hunt-Spiller by 16. Figures for mileage obtained on piston packing rings were submitted by 15 roads. The maximum and average figures are given below, together with similar figures for the roads using cast iron and those using Hunt-Spiller.

Mileage of Piston Packing Rings—Average of replies from 16 roads:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	45 000	60 000	60 000	70 000
Average	18 300	22 700	26 400	33 800

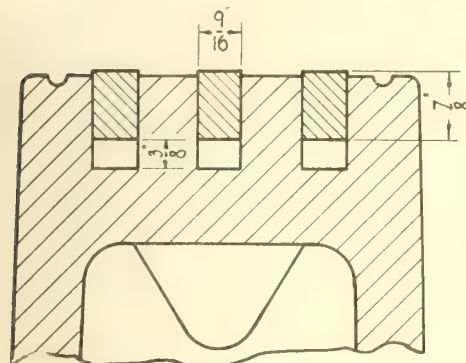


Fig. 11. Piston Packing Ring.

Mileage of Cast-iron Piston Packing Rings—Replies of 4 roads using C. I. for superheater locomotives and 8 roads using C. I. for saturated locomotives:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	14 000	20 000	32 500	49 800
Average	8 200	14 900	20 800	30 900

Mileage of Hunt-Spiller Piston Packing Rings—Replies from 11 roads using H.-S. for superheater locomotives and 7 roads using H.-S. for saturated locomotives:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	45 000	60 000	60 000	70 000
Average	21 900	25 700	38 600	37 600

Four roads report using Dunbar type packing, the others using the ordinary snap rings. The data in possession of the committee are such that at the present time no recommendation is made as to advantage of either, but offer sketches of some designs of rings, as shown. See figs. 9, 10, 11, 12.

Piston Heads and Bull Rings.—Cast iron is used for piston heads or bull rings on superheater locomotives by 16 of the roads reporting, and Hunt-Spiller is used by 16. Two roads are experimenting with pistons having a brass or bronze wearing face cast on the periphery of the piston. Twelve roads submitted figures for the mileage obtained on piston heads and bull rings. We give below the maximum and average of all the replies received, together with similar figures for the roads using cast iron and those using Hunt-Spiller.

Mileage of Piston Heads and All Bull Rings—Average of replies from 12 roads:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	135 000	180 000	135 000	180 000
Average	58 600	70 800	58 200	79 400

Mileage of Cast-iron Piston Heads and Bull Rings—Replied from 3 roads using cast-iron on superheater locomotives and 7 roads using cast-iron on saturated locomotives:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	72 000	98 000	62 500	100 000
Average	45 000	61 700	40 700	63 400

Mileage of Hunt-Spiller Piston Heads and Bull

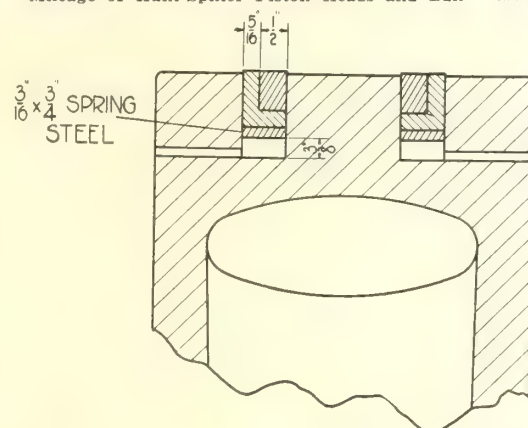


Fig. 12. Dunbar Piston Packing.

Rings—Replies from 6 roads using H.-S. on superheater locomotives and 3 roads using H.-S. on saturated locomotives:

	Superheater.		Saturated.	
	Frgt.	Pass.	Frgt.	Pass.
Maximum	135 000	180 000	135 000	180 000
Average	69 300	81 300	98 300	113 300

The piston shown in fig. 13 is an illustration of a box type piston, which is the type of piston in most general use in this country. Fig. 14 is an illustration of a steel plate type piston with a bull ring increased in width at the bottom, thus affording larger bearing area, where bearing area is needed. Fig. 15 shows a

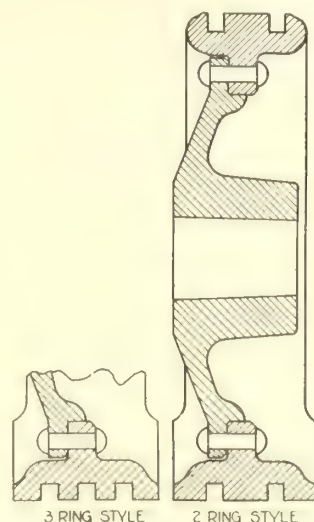


Fig. 14. Plate Type Piston with Bull Ring.

solid steel plate type piston recommended for use in connection with extended piston rods.

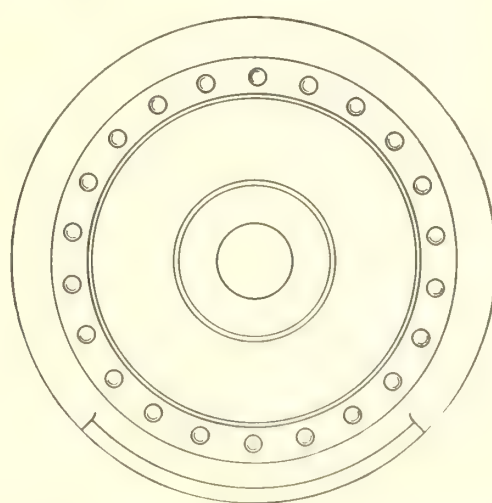
The committee feels that fig. 13 is representative of the best design of solid box type pistons. It is believed, however, that plate type pistons will be more generally used in the future, and the committee considers fig. 14 to be representative of the best design of plate type piston and bull ring.

The committee submitted the question of the desirability of providing extra long piston rods on new locomotives, or in rebuilding old locomotives, in order that the piston head can be moved forward

enough to replace cylinder packing without disconnecting cross-head. The opinion expressed by reports received is almost unanimous in favor of this practice for new locomotives. Most of the reports also favor this practice in the cast of rebuilding old locomotives, if it is practical to do so.

The committee can substantiate that part of the report of the committee on the maintenance of superheater locomotives, page 239, Proceedings A.R.M.M.A.,

1912: "A metal suitable for use as cylinder and steam-chest bushings of superheater locomotives should be homogeneous, close grained, tough and of good wearing quality, combined with sufficient strength. It should be tough in order to resist wear, but at the same time it must be of such composition that it can be readily machined." The qualities described are necessary not only for valve and cylinder bushings, but also for piston valve packing rings and bull rings, piston packing rings, and piston heads or bull rings.



We present here a summary of the percentage of the roads reporting that use Hunt-Spiller gun iron for the various parts on superheater and saturated locomotives:

Name of part.	Percentage of the Roads Reporting That Use H.-S.	
	For superheater locomotives, per cent.	For saturated locomotives, per cent.
Piston valve bushings	76	37
Piston valve packing rings	79	52
Piston valve bull rings	29	22
Cylinder bushings	71	35
Piston packing rings	82	47
Piston heads or bull rings	47	21

The large number of roads using Hunt-Spiller gun iron leads the committee to an investigation of what this product is. We

quote from the report of the Committee on Maintenance of Superheater Locomotives for 1912, as follows: "Replies to the circular of inquiry indicate that Hunt-Spiller gun iron has been used on many railways with excellent results. This is said to be an air furnace charcoal iron, and the process of manufacture, combined with the proper chemical composition, seems to result in a metal which is well adapted for use with highly superheated steam." Upon further investigation the committee ascertains that Hunt-Spiller gun iron is not a new product, but in fact is a very old one. It seems that as far back as about 1810 the late Cyrus Alger made many improvements in the metallurgy of iron, and by the process suggested and manipulated by himself was enabled to increase the strength of certain kinds of pig iron from its nominal strength to that of some 35,000 lbs. per sq. in. This iron was produced for the purpose of fabrication of ordnance and it was because of the use to which it was put that it derived its name, "gun iron." The analysis of this iron is practically as shown in the report of the committee of 1912. The physical structure, however, was not referred to, and,

noted that the report of the Committee on the Maintenance of Superheater Locomotives for 1912 shows that 18 out of 36 roads replying to the circular had locomotives equipped with extended piston rods, but 3 of these were eliminating them. It is seen, therefore, that there has apparently been no increase in the use of extended piston rods since that time. It is the contention of some that the use of extended piston rods reduces the wear of cylinder bushings and packing rings, due to the fact that they are relieved of the weight of the piston, with a consequent reduction of friction inside the cylinder. On the other hand, there is the increased first cost and the cost of maintenance of the extended rod and its cross-head, cross-head guide and extra set of rod packing, if this arrangement is used.

The question arises as to what extent extended piston rods are used on saturated locomotives. Only one road reports the use of extended rods on saturated locomotives. This road uses extended rods upon the low-pressure cylinders of both superheater and saturated Mallet locomotives. The committee finds that most of the roads using

being over 24½ in. With regard to the tendency of the extended piston rod to spring, reports show that 5 roads find this tendency. Nine roads state that there is no increase in expense of maintaining rod packing with extended piston rods, and 3 roads state that the expense is increased. One road states that the expense of maintaining piston rod packing is doubled by the use of the extended piston rod. Lubrication by oil cups is almost universal, only one road using the splash system for extended piston rods. Open-hearth steel is very generally used for extended piston rods. Experiments with vanadium steel or other special alloy steels have not developed to a point where the committee can recommend them for this purpose.

From a careful consideration of the replies, the committee concludes that there is no particular necessity for the use of extended piston rods, except where railways traverse hilly country where long stretches of drifting is usual. However, where its use is desired, we advise the necessity of such a diameter of extended rod as to prevent springing, and are of the opinion that in no event is the extended rod necessary on cylinders of 20 in. diameter and less.

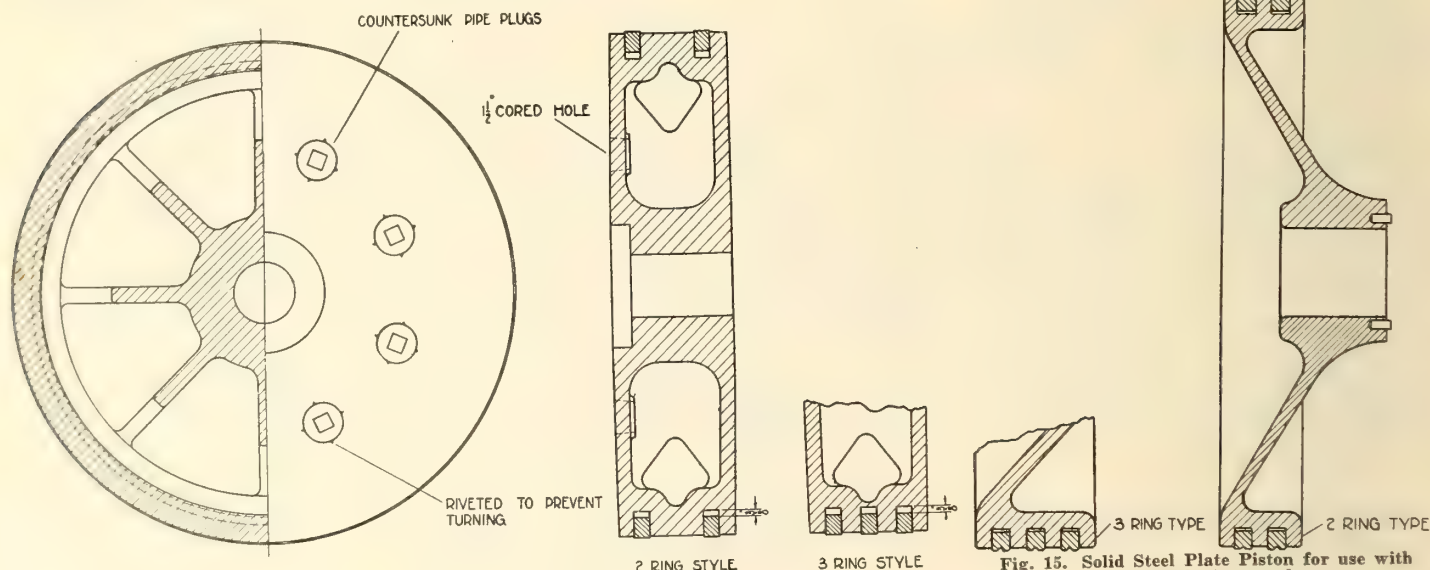


Fig. 13. Box Type Piston.

although exceedingly important, your committee also has made no attempt to determine and explain, due to the short time remaining in which to make the report. That Hunt-Spiller gun iron is generally considered to be efficient, economical, and for these reasons desirable, cannot be doubted, considering the fact that 80% of the roads reporting are using this product in their superheater locomotives for some of the parts mentioned; therefore the committee does not hesitate to recommend its use for piston valve bushings, piston valve packing rings, piston valve bull rings, cylinder bushings, piston packing rings, and pistons or piston bull rings.

Extended Piston Rods.—The committee included in its circular of inquiry a list of questions on the use of extended piston rods. Eighteen roads report experience with extended piston rods. A great diversity of experience and opinion has been expressed. Three roads out of the 18 have entirely discontinued the use of extended piston rods as a result of their experience, and several others find them to be of no advantage. On the other hand, several roads state that a saving is effected by the use of the extended piston rods. For comparison it may be

extended piston rods are using a small cross-head on the front end of the extended rod; in fact, only one road reports the use of any other device. This road uses an arrangement in which the extended piston rod slides in a brass sleeve. The Cole type of piston rod extension is in most general use. This arrangement is described as consisting of a miniature cross-head at the front of the extended rod, which slides on a cylindrical surface, rigidly supported and easily located on the cylinder head. The wear of the extension cross-head on the guide is taken care of by lining up between the small cross-head shoe and its body. The packing on the extended rod is easy of access and can be repaired without difficulty. The extension guide is self-centered on a circular flange of the cylinder head, and requires no adjustment in service, as it cannot get out of position. The guide is made with an open top, so that when it is necessary to remove the guide it can be dropped from the rod.

Twelve roads have reported the minimum size of cylinders used in connection with extension piston rods. The minimum diameter of high-pressure cylinders varies from 20½ in. to 29 in., the average

Fig. 15. Solid Steel Plate Piston for use with extended piston rod.

International Railway Fuel Association.—At the annual convention at Chicago, Ill., recently, it was announced that there was a total membership of 636. During the meetings 68 new members were enrolled. The officers for the current year are: President, W. H. Averell, Baltimore and Ohio; Vice Presidents, E. W. Pratt, Chicago and North Western; L. R. Pyle, Minneapolis, St. Paul and Sault Ste. Marie; W. L. Robinson, Baltimore and Ohio. The convention for 1917 will be held at Chicago.

Railway Storekeepers' Association.—The officers for the current year, elected at the recent annual convention, are: President, W. A. Summerhayes, Illinois Central; First Vice President, H. S. Burr, Erie; Second Vice President, E. J. Roth, Chicago, Indianapolis and Louisville; Third Vice President, J. N. Shaw, Delaware, Lackawanna and Western; Treasurer, J. P. Murphy, New York Central.

In machining operations the speed and the feed are settled upon in the works planning department, and are based on the power of the machine and the character of the metal to be machined. These have been worked out after careful study, and for efficiency displace the old method of relying on the workman's judgment.

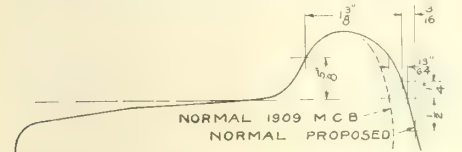
Report of Committee on Car Wheels.

The Master Car Builders' Association committee, W. C. A. Henry, Superintendent Motive Power, Pennsylvania Lines, Columbus, Ohio, chairman, and of which L. C. Ord, Assistant Works Manager, Car Shops, Angus Works, Canadian Pacific Railway, Montreal, now on active military service, was a member, reported as follows:

The following resolution of the American Railway Association's Committee on Maintenance was forwarded Nov. 7, 1913, by the General Secretary of that association to the Secretary of the M.C.B.A.:

Thickness of Flange for All Chilled Iron Car Wheels Recommended by Association of Manufacturers of Chilled Iron Car Wheels.

"Resolved, That the subject of the contour of chilled car wheels and the throat clearance for frogs, guard rails and crossings be referred to the American Railway Engineering Association and the Master Car Builders' Association jointly for a full investigation and report, with their



Thickness of Flange for All Chilled Iron Car Wheels Recommended by Association of Manufacturers of Chilled Iron Car Wheels.

"Resolved, That the subject of the contour of chilled car wheels and the throat clearance for frogs, guard rails and crossings be referred to the American Railway Engineering Association and the Master Car Builders' Association jointly for a full investigation and report, with their

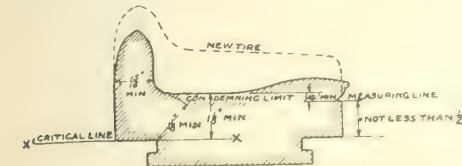


FIG 1 STEEL TIRE RETAINING RING FASTENING

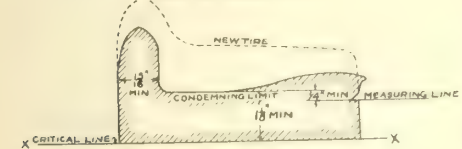


FIG 2 STEEL TIRE SHRINKAGE FASTENING ONLY

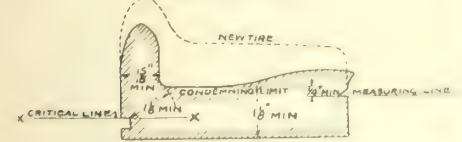


FIG 3 STEEL TIRE RETAINING RING FASTENING

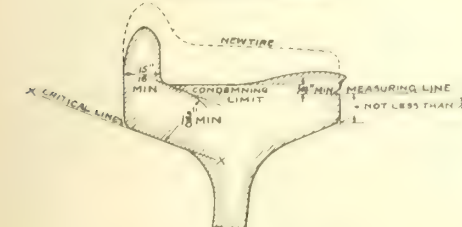


FIG 4 STEEL WHEEL MINIMUM DIMENSIONS FOR WROUGHT STEEL AND STEEL TIRE WHEELS

recommendations for any change that they may conclude is desirable."

This subject, having been referred to the Committee on Car Wheels, has been investigated jointly with the American Railway Engineering Association's Committee on Track. This subject was originally brought up by the Association of Manufacturers of Chilled Car Wheels, that association arguing that the strength

of the flange of the chilled iron car wheel has not kept pace with the increase in the load, and that the wheels under cars, especially of the higher capacities, should have the flanges thickened. The following diagram shows the thickness of the flange recommended by them for all chilled iron car wheels. The Association of Manufacturers of Chilled Iron Car Wheels has been called upon for all information available, tending to show the necessity for a thicker flange. They have also been represented at a meeting of our committee, as well as at a joint meeting with

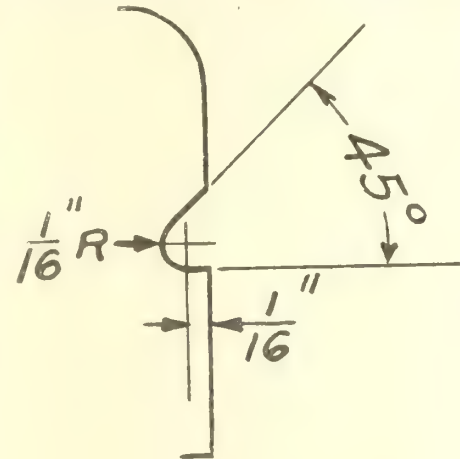


Figure 5.

a subcommittee of the American Railway Engineering Association's Committee on Track.

On May 1, 1914, a circular was sent to all M.C.B. Association members, requesting that special reports be made of all broken wheels, and explaining in detail the information desired. Replies were received from 33 railways and 1 private car line, representing an ownership of 1,297,-

WT. OF WHEEL LBS.	YEAR OF CAST	NUMBER OF WHEELS REPORTED AS THICKNESS OF FLANGE AT A POINT 3/8" ABOVE TREAD						TOTALS.
		LESS THAN 1 1/16"	1 1/16" TO 1 1/8"	1 1/8" TO 1 3/16"	1 3/16" TO 1 1/2"	OVER 1 1/2"	OVER 1 1/2"	
625	1909	1						1
625	1910							
625	1911							
625	1912							
625	1913							
625	1914							
625	1915							
625	TOTAL	2	3		2	3		10
675	1909							
675	1910							
675	1911							
675	1912							
675	1913							
675	1914							
675	1915							
675	TOTAL	2	3	2	2	5		10
725	1909							
725	1910							
725	1911							
725	1912							
725	1913							
725	1914							
725	1915							
725	TOTAL	2	3	2	2	5		10
TOTAL		4	6	2	2	8		20

Exhibit A. Summary of Flange and Tread Failures.

909 cars, approximately 46.2% of the cars owned or controlled by railways or individual companies, members of the M.C.B. Association.

Exhibit A is a tabulation of replies received to this circular, covering all M.C.B. wheels of the present standard cast from 1909 to 1915, having broken flanges and for which the flange thickness was given. For each of the three standard

weights of wheels the information has been grouped so as to show the year cast and the thickness of the flange, measured at a point three-eighth inch above the tread. In addition to the 103 cases shown on this tabulation, there were four 625-lb., five 675-lb., and seventeen 725-lb. wheels reported, a total of 26 for which the thickness of flange was not shown.

Exhibit B shows the location and direction of the fracture for such of the wheels shown in Fig. 2, for which this information was furnished. Of the 103 cases shown in Fig. 2, 62 were reported as the result of seams, 3 due to worn flange, 2 to defective castings, 1 to worn tread, 1 overheated, 3 thick chill, no reason whatever being given for the remaining 31 cases. By referring to Figs 2 and 3 it will be seen that these failures are not by any means confined to wheels having the

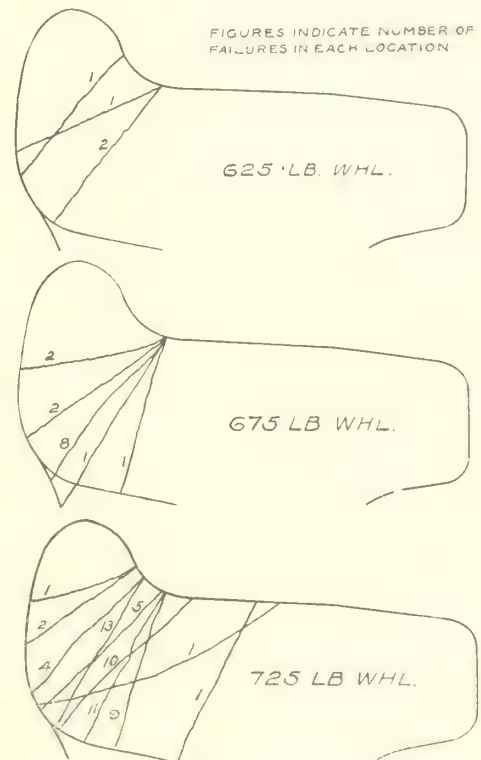


Exhibit B. Location of Flange and Tread Failures.

thinner flanges, and that of the 103 cases, 27 occurred with a flange thickness over one and three-sixteenths inches, or above the minimum thickness for a new flange. The location and direction of the fracture in nearly all cases more nearly approaches the vertical than the horizontal, and does not occur through the minimum section of metal.

One of the roads represented on this committee has obtained the exact contour and dimensions of the flanges of all cast iron wheels that were withdrawn from service on account of seams in the tread at or near the throat of the flange during a period of twelve months. These are accurately shown on Exhibits C, D and E for the three sizes of wheels; also the outline of the flange and a portion of the tread of the M.C.B. standard cast iron wheel of the three nominal weights are shown. In obtaining these specimens in each case the flange back of the seam was broken off with a sledge, and the outline traced from a section cut from same at the middle of the seam. The

depth of the seam is indicated by the heavy line extending downward from the tread. All of these cases, if not detected by inspection and the wheel withdrawn from service, would have finally resulted in a so-called broken flange, and for purposes of study are of the same value as if actually broken off in service.

Of the 12 cases shown on Exhibit C there are no fractures in even an approximately horizontal direction across the flange, while in a number of cases the fracture extends in an almost perpendicu-

way track clearances.

It is most apparent from a study of the thickness of the flanges as shown on exhibit A, the location and direction of the fractures as shown on exhibit B to E, inclusive, that the flange thickness at or near the base line, or for such distance from the base line as would affect rail clearances, can have little or no bearing on failures of this nature, as in the majority of cases the original failure occurs in the tread, and the term "broken flange" as ordinarily used is being ap-

made, under tenders, of special cast iron wheels having a flange of $\frac{1}{8}$ in. greater thickness than the present M.C.B. standard. These wheels were mounted 4 ft. 8 in. throat to throat, or 5-16 in. wider than standard. The average age of 203 of these wheels when condemned was 11 months. Of a like number of M.C.B. wheels in the same service, the average age when condemned was 11.1 months. Of the special wheels, 28% were condemned on account of worn flange, the average age of which was 12.5 months. Of the M.C.B. wheels, but 15.2% were condemned on account of worn flanges, the average age in this instance being 13.7 months. These figures indicate that the thicker flange did not improve conditions, but rather the reverse. Two roads report having experimented with thicker flanges, and upon examination found that the back of the flange in almost every case was grooved by contact with guard rails and frogs. Four typical cases are shown on exhibit F.

In addition to the above, there are the further minor objections to heavier flanges: of increased weight and a slightly increased cost; although these latter objections are not worthy of consideration if the thicker flange gave indications of adding anything to the safety or life of the wheel.

Failures of flanges of cast iron wheels, under fair usage, other than those caused by circumferential seams, are so rare as to be almost unknown. These seams will frequently reach a length of from 24 to 28 in. before failure actually occurs, and the location and direction is such that the addition of metal to the back of the flange, within limits that will affect rail clearances, gives no promise whatever of

lar direction, and is distinctly a tread failure. Particular attention is called to flange no. 2, which failed on account of a seam starting about midway between the top of the flange and the base line. It would be expected in this case that if the flange proper were not sufficiently strong for the purpose intended and the service to which subjected, it would have broken off in a nearly horizontal direction.

In exhibit D, as in exhibit C, the direction of fracture in nearly all cases approximates the vertical, and in many instances the location of the seam is at a considerable distance from the flange. Attention is called particularly to no. 14. In this case the seam is within $\frac{1}{4}$ in. of the middle of the tread. On this sheet there is one flange failure, namely, no. 15, which is similar to no. 2 on exhibit C. Of the 18 cases shown in exhibit D there is only one, viz., no. 16, where the direction of the fracture would indicate the probability that metal added to the back of the flange might have prevented the fracture.

In the case of exhibit E, on which are tabulated the heavy wheels, the location and direction of fracture is about the same as for the lighter wheels. Particular attention is called to flanges nos. 7 and 8. The former was obtained from a wheel of special design, weighing 750 lb., cast in Jan., 1913. The flange of this wheel was reinforced by the addition of considerable metal at the back and below the base line. Attention is called to the seam which was found in this wheel, and which occurred in the characteristic location. The direction of the same, as well as the line of fracture when breaking off the flange, differ in no respect from the majority of the others. The back of the flange of this wheel has been worn or grooved considerably by contact with guard rails and in passing through frogs, the original contour at this point being shown by dotted lines. Flange no. 8, which was obtained from a 700-lb. wheel cast in Mar., 1906, is the only one among the 15 on this sheet that might have been helped by the addition of metal to the back of this flange, although this would be at such point as not to affect in any

plied to what is primarily a tread failure.

A flange thicker than the present standard has some distinct disadvantages. One of the strongest arguments offered for the adoption of the present taper of tread of 1 in. in 20 in. was the opportunity afforded a pair of wheels to move laterally until both run upon a common di-

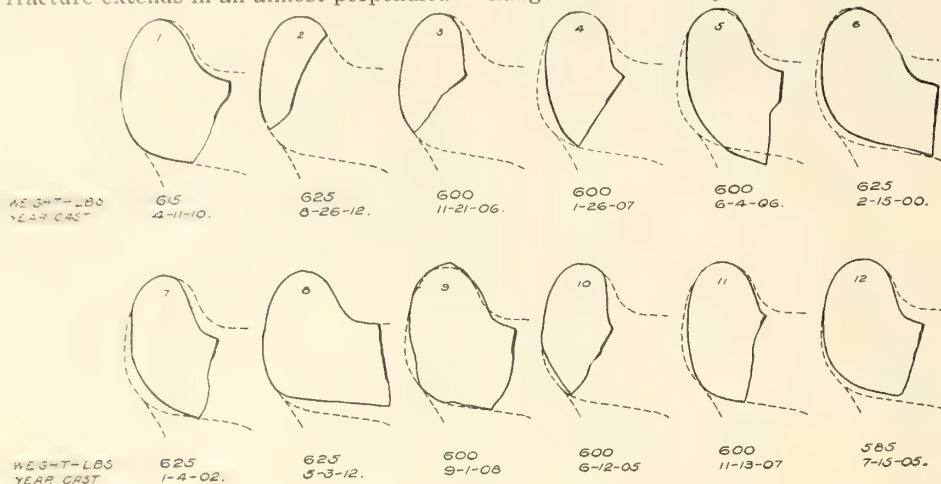


Exhibit C.

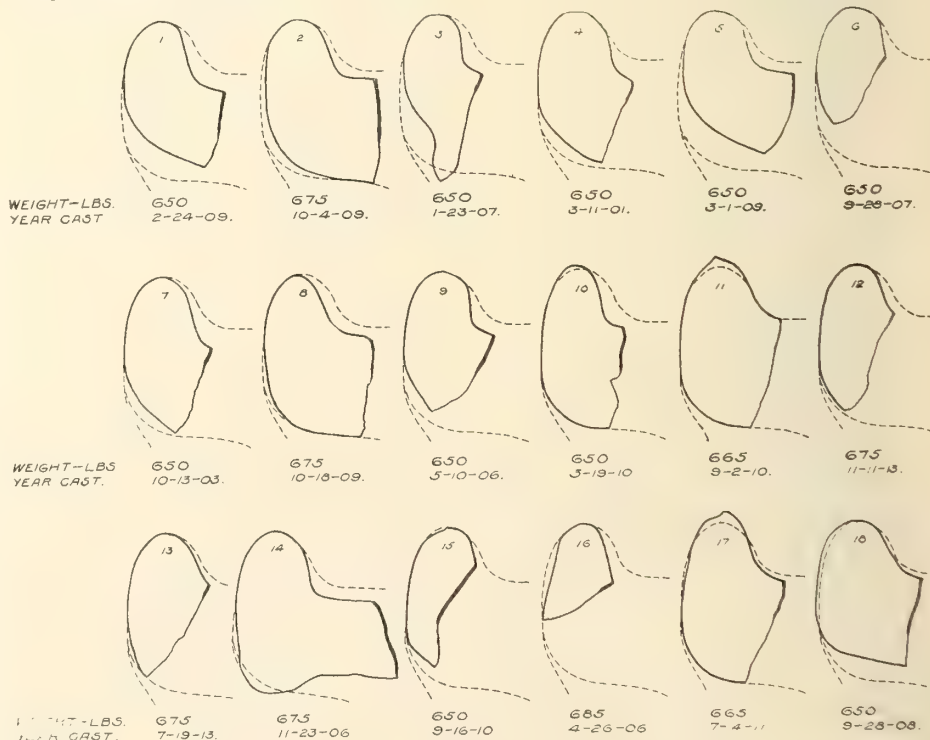


Exhibit D.

ameter, this condition tending to keep flanges away from the rail, thereby not only decreasing the flange and rail wear, but train resistance as well. Unless the whole track structure is changed a thicker flange would reduce or eliminate entirely this opportunity for lateral motion. Confirming the above, we would cite the case of one railway on which a trial was

affording any relief from so called flange failures. A study of the information available does not indicate that under the present standards for new flanges and the condemning limits for thin flanges, the horizontal thickness of the flange has anything to do with failures of the kind under consideration.

Under date of March 14, 1916, your

committee addressed a communication to the American Railway Engineering Association's subcommittee on track, advising that it was the unanimous opinion of our committee, after a thorough study of flange failures and so called flange failures that the addition of metal to the back of the flange within any limits that would alter the relation of the flange to the track would have no effect whatever on flange failures; furthermore, that we saw no reason for recommending any changes for throat clearances for frogs, guard rails and crossings, and that it was our recommendation that there be no change in the dimensions and contour of flanges of car wheels or throat clearances for frogs, guard rails and crossings, as adopted in 1909.

Your committee is unanimously of the opinion that nothing will be gained in the interests of safety or economy by adding metal to any portion of the flange of cast iron car wheels in such location as will in any way affect track clearances. Wheth-

sideration, with the recommendation that it be adopted as recommended practice:

MOUNTING PRESSURE IN TONS.

Axle.	Wheel seat Diam.	Cast iron wheels.		Steel wheels.	
		Min.	Max.	Min.	Max.
A	5½ in.	30	45	45	60
B	5¾ in.	35	50	50	70
C	6½ in.	40	60	60	80
D	7 in.	45	65	65	85
E	7¾ in.	50	70	70	95

The following change should be made in specification governing dimensions and tolerances for solid wrought steel wheels:

Paragraph "3g. Limit of Wear Groove"—The limit of wear groove to be located as shown on sheets M.C.B.—R, S and T."

This change is a correction, as M.C.B. sheet C, referred to in present specifications, is not intended to apply in the case of specifications for new wheels.

There appears to be more or less misunderstanding as to the condemning limits for steel tired wheels as shown on M. C.B. sheet C. In order to make the matter more clear, we would recommend that

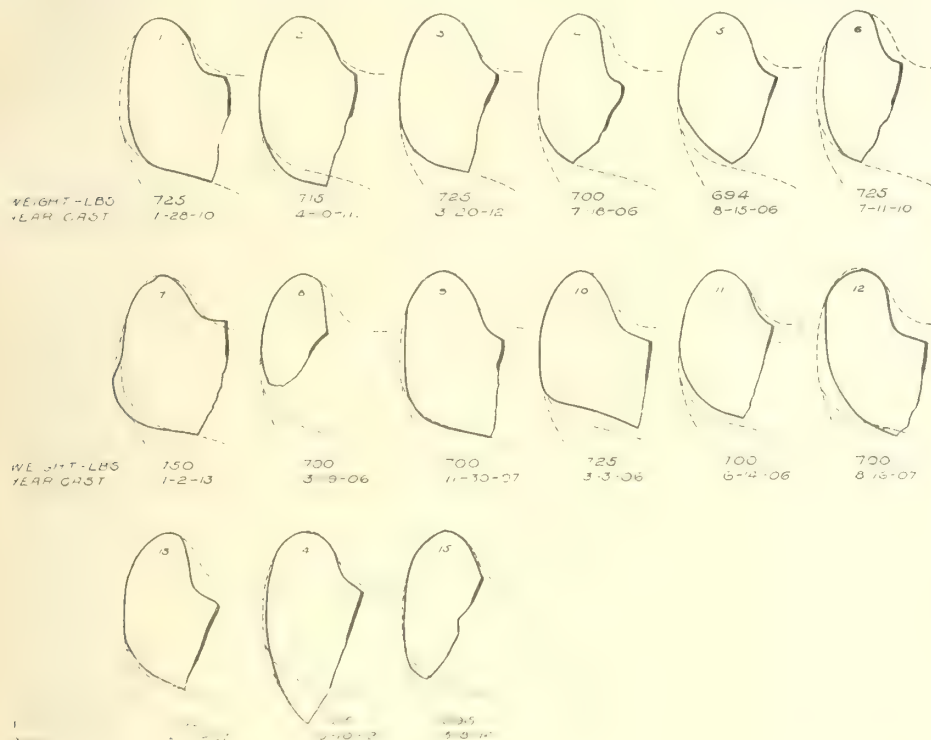


Exhibit E.

er the addition of metal to the back of the tread so as to increase throat thickness will afford any relief is a question on which your committee is not at this time ready to express an opinion, although the matter is under consideration.

The subject of the shape and thickness of plate for cast iron car wheels is one that gives promise of leading to changes that will result in reducing plate failures. Experiments are being conducted by the Pennsylvania Rd. at Altoona, Pa., for the information of the Car Wheel Committee in investigating this subject, and it is hoped that we will be in a position to make report to the next convention.

The question of design and specifications for a cast iron wheel for use with the 6 by 11 in. axle is under consideration, and will be made the subject of a future report.

It has been recommended that this association should have standard maximum and minimum pressures for mounting wrought steel and cast iron wheels on axles of the different sizes, and the following table is hereby submitted for con-

sideration, with the recommendation that it be adopted as recommended practice: MOUNTING PRESSURE IN TONS. The following change should be made in specification governing dimensions and tolerances for solid wrought steel wheels: Paragraph "3g. Limit of Wear Groove"—The limit of wear groove to be located as shown on sheets M.C.B.—R, S and T."

This change is a correction, as M.C.B. sheet C, referred to in present specifications, is not intended to apply in the case of specifications for new wheels. There appears to be more or less misunderstanding as to the condemning limits for steel tired wheels as shown on M. C.B. sheet C. In order to make the matter more clear, we would recommend that

figs. 1, 2, 3 and 4 be changed, as shown herewith, the change consisting in removing reference to the flange height, which has no bearing on this subject, removing the words "Not less than ½ in." from fig. 3, and indicate that certain other dimensions affected by wear are all minimum dimensions. We have received complaint that it is extremely difficult to maintain tools for turning the limit of wear groove for steel and steel tired wheels, as shown on M.C. B. sheets C, R, S and T, and it has been recommended that to correct this trouble the shape of the limit of wear groove be slightly modified so that there will be a fillet at the bottom of the groove instead of the present sharp angle. It is therefore recommended that the shape of the limit of wear groove be changed in accordance with fig. 5, and that it be shown on sheets C, R, S and T, and to such scale as to make the shape and dimensions plain. The Secretary is requested to make corrections and changes in M.C.B. sheets C, R, S and T, referred to above.

Railway Supply Exhibits at the Atlantic City Conventions.

The Railway Supply Manufacturers' Association exhibit was, as usual, of a very comprehensive nature, larger than in 1915 but not as large as in 1914. Among the principal exhibitors were the following:—

American Brake Shoe & Foundry Co., Mahwah, N.J.—Reception booth.

American Locomotive Co., New York, N.Y.—Reception booth.

Anchor Packing Co., Philadelphia, Pa.—General locomotive packings.

Buffalo Brake Beam Co., New York, N.Y.—Freight brake beams for all classes and capacities of equipment; truss beams with either malleable iron or forged steel struts to M.C.B. standards; also beams for E. & L. equipment and all classes and capacities of tenders and electrical equipment for standard broad and narrow gauge; Buffalo passenger brake

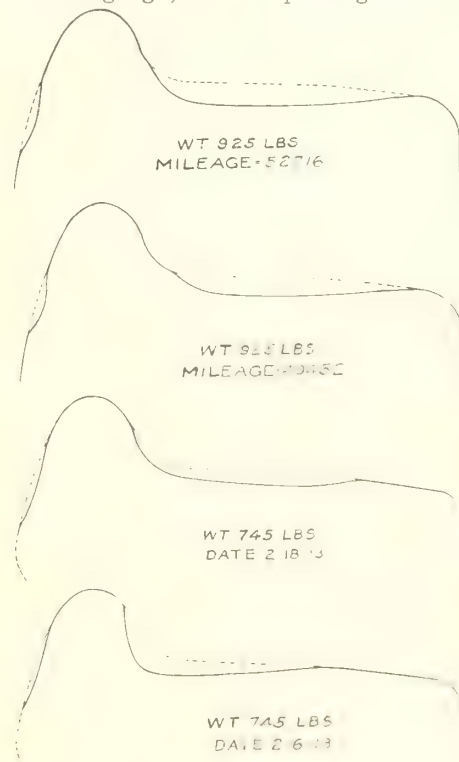


Exhibit F.

beams for all classes of service, including L.N. & P.C. equipment with automatically adjustable heads and safety locks.

Chicago Car Heating Co., Chicago, Ill.—Car heating apparatus.

Consolidated Car-Heating Co., Albany, N.Y.—Nine foot section of one side of a passenger car in which all the specialties used in a modern steel car are installed; Thermo-vapor temperature regulator, whereby a constant temperature is maintained; automatic attachment whereby temperatures in sleeping and private cars can be so controlled that they will maintain a 70 deg. temperature in the day time and 60 deg. temperature at night.

Dearborn Chemical Co., Chicago, Ill.—Boiler feed water treatment scientifically prepared to meet requirements shown by analyses of the waters used.

Detroit Lubricator Co., Detroit, Mich.—Detroit locomotive lubricators; flange oilers, and air cylinder lubricators; Detroit lubricators; force feed oilers; packless radiator valves; Stewart carburetors.

Du Pont Fabrikoid Co., Wilmington, Del.—Fabrikoid; superior leather substi-

ture; travel goods; bookbinding novelties.

Fairbanks Morse & Co., Chicago, Ill.—50 h.p. 2 phase, 60 cycle, 220 volt, 900 r.p.m. type H electric motor with special insulation treatment; 25 h.p. 3 phase, 60 cycle, 220 volt, 1,200 r.p.m. type KHV motor with special insulation treatment; 15 h.p. 3 phase, 60 cycle, 220 volt, 900 r.p.m. type H motor with special insulation treatment and CC starter; Rotor complete with half bearing arm for large type H motor; CP type ball bearing motor with special water proof insulation treatment.

Flannery Bolt Co., Pittsburgh, Pa.—Tate flexible staybolts; Tate radial staybolts; installation tools for application of Tate flexible staybolts.

Franklin Railway Supply Co., New York, N.Y.—Franklin automatic adjustable driving box wedge; Franklin fire door; Franklin single water joint; Stone-Franklin lighting equipment.

Galena-Signal Oil Co., Franklin, Pa.—Reception booth with samples of oils.

Garlock, Packing Co., Palmyra, N.Y.—Garlock air pump and throttle packing; superheat sheet and gaskets; packings for general shop purposes.

Goldschmidt Thermit Co., New York, N.Y.—Thermit and appliances for Thermit welding; sample welds; samples of carbonfree metals and alloys produced by Thermit process; large sample weld on a 9 in. crank shaft; materials and appliances for demonstrating pipe welding for the purpose of welding locomotive superheater units; sample of superheater unit welded by Thermit process.

Hunt-Spiller Manufacturing Corp., Boston, Mass.—Cylinder packing; cylinder bushings; piston heads; valve packing; valve bushings; valve bull rings; side rod bushings; knuckle pin bushings; air pump packing; air pump bushings; eccentrics; eccentric straps; crosshead shoes; slide valves; valve strips; pedestal shoes; pedestal wedges; driving boxes.

Locomotive Superheater Co., New York, N.Y.—Pictures illustrating meth-

ods and process used in manufacture and superheater units and headers at plant at East Chicago, Indiana.

Norton, A. O., Inc., Boston, Mass.—Self lowering high speed jacks.

Standard Coupler Co., New York, N.Y.—Westinghouse Air Brake Co., Pittsburgh, Pa.—Reception booth.

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.—Reception booth.

Westinghouse Friction Draft Gear Co., Pittsburgh, Pa.—Reception booth.

Westinghouse Lamp Co., Pittsburgh, Pa.—Reception booth.

Westinghouse Lamp Co., Pittsburgh, Pa.—Reception booth.

Westinghouse Pacific Coast rake Co., Emeryville, Cal.—Reception booth.

Westinghouse Traction Brake Co., Pittsburgh, Pa.—Reception booth.

Wheel Truing Brake Shoe Co., Detroit, Mich.—All kinds of abrasive brake shoes for operating upon locomotive tires and car wheels.

Report of Committee on Modernizing of Existing Locomotives.

The American Railway Master Mechanics' Association committee, F. J. Cole, chairman, reported as follows:—This committee had the following subjects referred to it for consideration:—

1. Length of time a locomotive should be built in order to justify modernizing. 2. The conversion of consolidation locomotives into mikados. 3. Change of type of locomotives. 4. Superheating saturated-steam locomotives. 5. Brick arches. 6. Outside valve gear. 7. Size of valves. In order to obtain information from railways as to what had already been done in this respect, a circular was sent to the members on Nov. 1, 1915, inquiring as to the character, extent and results of their practice in the direction of modernizing existing locomotives. Only 32 replies were received. The conclusions of the committee and their answers to the questions are as follows:

Question 1. Length of time a locomotive should be built in order to justify modernizing.—In this question the matter of what constitutes modernizing should be clearly borne in mind. Old locomotives are usually lighter in weight and have less tractive power than those built at present. The track, bridges, etc., have been increased in strength on most railways, so that higher axle loads and greater total weights can be borne with safety than in previous years. In many instances, however, the capacity, weight and condition of old locomotives would justify the application of many improvements, such as superheating, etc., which make for economy and increase in capacity.

When consideration is given to the question of changing the type of locomotives, as for instance changing the wheel arrangement of consolidation 2-8-0 into mikado 2-8-2, the matter of weight and capacity is the vital issue. Will the locomotive, after a large amount of money, say 50% of its cost, has been spent, be modern in all respects, and will it perform the work in the most satisfactory and economical manner? In other words, will it, when rebuilt, be a thoroughly up-to-date locomotive as could be purchased for this particular service? The matter, therefore, resolves itself into one of judgment as to how much should be spent upon an old locomotive and whether the old locomotive after being rebuilt or modernized is a thoroughly satisfactory

one for the service which it is intended to perform.

Question 2. The conversion of consolidation locomotives into mikados.—A great many locomotives have been thus modernized. This change is especially desirable where greater boiler capacity is necessary in maintaining speed and sustained horse power in cases where the limitation of the locomotive has been the inability of the boiler to supply the necessary amount of steam. Where consolidation locomotives are of large size, with wheels of suitable diameter and ample crank pins and axles, having modern tenders of large capacity, where many other parts can be used to advantage, it is often economy to reconstruct such consolidations 2-8-0 and convert them into mikados 2-8-2. One leading railway system has converted between 400 and 500 consolidations 2-8-0 class into mikados 2-8-2 class. The efficiency of its power is thereby materially increased.

Most consolidations built during the last 10 or 15 years have shallow fire boxes on top of the rear pair of drivers. It is more difficult with such locomotives, on account of the shallow throat, to equip them in a satisfactory manner with brick arches. When they are converted into mikados a fire box of any size and depth can be used and brick arches applied in a most satisfactory manner. Flues may be increased in length and smoke box temperatures, that is the heat of the escaping gases, may be decreased correspondingly. The longer bodies also permit the use of combustion chambers, if desired.

A mikado locomotive can at times be operated at much longer cut off without lowering the steam pressure too much, the boiler being ample to provide an adequate amount of steam under the most exacting conditions.

As a general proposition, a locomotive boiler cannot be made too large. It often is made too small. Therefore, one of the most satisfactory means of increasing economy and capacity is to increase the boiler capacity. Fuel is burned on many old locomotives at the rate of 180 to 200 lb. per sq. ft. of grate per hour, but this practice is very uneconomical, as the rate of combustion is so high that a great deal of unburned products of combustion are passed through the flues and

smokestack without giving up all their available heat. On the other hand, if ample grate surface is provided, the rate of combustion can be kept down to reasonable limits and the economy of the locomotive increased materially. These economical conditions prevail when a deep fire box of ample size is provided, and the coal can then be burned under the best conditions.

Question 3. Change of type of locomotives.—A partial answer to this question is contained in question 2. The majority of locomotives which have had the type changed in modernizing have consisted of consolidations 2-8-0 to mikados 2-8-2. Some consolidations 2-8-0 have been converted to eight-coupled switching locomotives by removing the truck and changing the distribution so as to throw the spring-supported weight farther back. As a general proposition, in considering the conversion of type, it is very necessary to make careful study of parts that can be used on the old locomotive, such as wheels, axles, rods, tender, etc., at the same time estimating or obtaining bids from builders as to what the work can be done for. Very careful consideration must also be given to ascertain whether, after the rebuilding has been accomplished, the railway would be in possession of a really modern locomotive best adapted to perform the service for which it is intended.

Question 4. Superheating saturated steam locomotives.—The advantages gained from the use of superheated steam on locomotives are now so widely recognized that no special argument in its favor is necessary in this report. At present, nearly all new locomotives are equipped with superheaters. Thousands are being applied every year to old locomotives, and in the near future the majority of the 68,000, or thereabouts, of locomotives in the United States and Canada will be so equipped. At present it is estimated that 15,500 locomotives in the United States and Canada have superheaters applied. Superheated steam is a much better working medium in steam engines than saturated steam. The expression, "dry, saturated steam," is often used, but in practice it is seldom realized, because the steam before it enters the cylinders contains a certain percentage of moisture, and when in contact with the cylinder walls much more heat is given

up, so that at the time of actually moving the pistons it contains a large amount of moisture.

Steam is said to be superheated when its temperature is higher than the boiling point corresponding to the pressure. Steam cannot be superheated in contact with the water from which it was generated. In order to receive additional heat, it must be separated from its liquid and subjected to still higher temperatures. Saturated steam is an unstable fluid or vapor. When in contact with its liquid at any given pressure, it is evident that a narrow margin of heat divides the liquid from the vapor. Any abstraction, therefore, of heat causes one of two things: either a portion will become liquefied or the pressure will be decreased. Superheating affords the only means of adding heat to the steam without increasing its pressure. The economy of highly superheated steam for locomotives is obtained, 1st, in its freedom from condensation losses in the cylinders and steam pipes; 2nd, from the increased volume of superheated steam per unit of

even greater than this increase in indicated horse-power. The reason of this is that at the running speeds of trains about 40% of the i. h. p. is absorbed by the internal friction of the engine and tender, leaving only about 60% to be transmitted to the drawbar. Consequently an increase of 33% of i. h. p. represents a much greater gain in dynamometer horse-power. Therefore, the friction of the locomotive being fairly constant, a much greater drawbar pull than 33% is available at the critical points.

This large addition to the hauling capacity of a highly superheated steam locomotive may be applied either to the hauling of heavier trains or to higher speeds, or to both. An increase in total weight or wheel load due to the application of the superheater is relatively small, say 3000 to 4000 lb. Consequently increased tractive power is obtained without material addition to the weight.

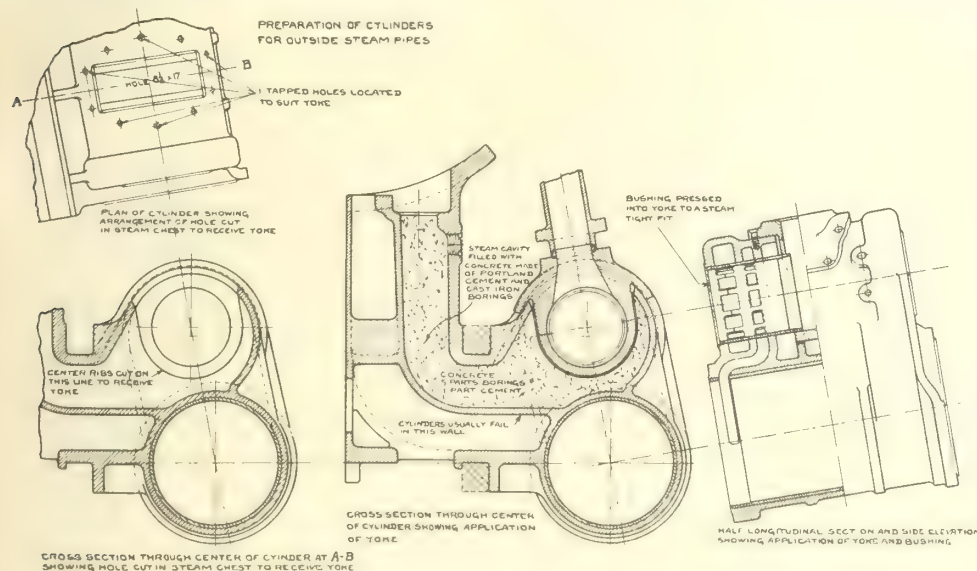
Superheating affords the most available means of meeting in a very economical way the steadily increasing demand

same locomotive. The limitation of locomotives in many instances is the inability to supply them with coal in sufficient quantities and at the proper time; therefore, any device which reduces the amount of coal necessary to be fed to the furnace is a long step toward improving the general efficiency of the engine.

When new fire boxes or fire box tube sheets are required, it is desirable to consider the application of superheaters to such locomotives, the boilers of which are otherwise in good condition, whose age does not exceed, say, 15 years, or where new boilers are required on locomotives which otherwise can be used with advantage for some particular service. In such instances the application of superheaters to old locomotives is one which will well repay the outlay.

Question 5. Brick arches.—On the majority of locomotives a brick arch, properly installed and maintained in good condition, will produce a substantial saving in fuel, and also, by doing the work with smaller amount of coal, improve the general efficiency of the locomotive. Probably a saving of about 5 to 10% can often be made by the application of brick arches. It therefore follows that if without the arch it takes 100 lb. of coal to do a certain amount of work, that with a saving of 10% and the same amount of coal is fed to the fire box, an increase in the steaming capacity of 11% will be produced. The brick arch, by increasing the length of flameway in the fire box and preventing the gases and unburnt coal from entering directly into the boiler tubes before complete combustion has taken place, adds materially to the steaming capacity of the boiler and reduces the amount of coal necessary to be fired. Much benefit will also be derived from its use by preventing the formation of black smoke.

Question 6. Outside valve gear.—Few locomotives at present are built with the inside or Stephenson valve gear. The size of locomotive has increased to such an extent that it is very difficult to maintain the eccentrics and the inside portions of the moving parts of a Stephenson gear in a satisfactory condition. The outside gears are much easier to lubricate, maintain and inspect. Their moving parts consist mostly of articulations, provided with case-hardened pins and bushings in place of the large rubbing wearing surfaces, such as eccentrics and straps. The repairs and maintenance of outside valve gears to keep them in good condition are much easier and cheaper than the Stephenson. Furthermore, the reduced wear of the outside valve gear, by reason of its case hardened pins and bushings, does not distort the gear to the extent that the wear of the eccentrics and straps does on the Stephenson gear. This is a very important matter, since the outside gear requires but little or no adjustment or resetting of valves from time to time, it being the custom on many railways to make the gear what is termed "a blacksmith job," that is, provided with no means of adjustment, so that any change required in valve-setting must be made by upsetting or lengthening the rods in a blacksmith shop. This is a distortion due to wear with the outside gear, except that caused by the wearing of the main box in the pedestals, the position of the wedge, or wear of the shoe, it follows that the outside gear can be left alone without tinkering or adjustment to a greater extent than is possible with the Stephenson or inside gears. Another advantage of the outside valve gear is that transverse bracing can be used between the frames to maintain them in proper



Method of Applying Outside Steam Pipes to Piston Valve Cylinder, Southern Pacific Co.

weight. At 200 lb. boiler pressure, with 250° of superheat, this amounts theoretically to about 40% greater volume than an equal weight of saturated steam. The amount of cylinder condensation in a simple saturated-steam locomotive is estimated to be from 35% at 20½% cut-off, to 12% at 70% cut-off. Assuming that each 1% of moisture will require about 7.5° of superheat to entirely prevent condensation, it follows that with 25% of moisture a superheat of at least 187° will be required, and more is advantageous.

In considering the advantages of superheated steam for locomotives, two general conditions may be noted. 1. The economy in coal and water from the use of superheated steam. 2. The additional power made available by the more economical operation of the locomotive. If a simple locomotive, using highly superheated steam, consumes on an average 25% less fuel in the same service than the same locomotive using saturated steam, then 75 lb. of coal consumed with superheated steam will do the same work as 100 lb. used with saturated steam. There will be, therefore, an increase in

indicated horse-power of $\frac{100 - 75}{75} \times 100$

= 33 per cent. in favor of the superheater, and the actual gain in tractive power delivered at the drawbar will be

for more powerful locomotives without making them abnormally heavy. The application, to existing locomotives, of an efficient superheater capable of producing and maintaining a high degree of superheat, is equivalent to a considerable increase in boiler capacity, which is usually equivalent to a large increase in the hauling capacity of a locomotive. Not only is there considerable fuel economy, ranging from 20 to 25%, in the use of superheated steam, but the general efficiency of the locomotive is so increased as to make it a necessary part of the equipment of all new locomotives and in many cases on old ones. By reducing the amount of fuel required for a given amount of work, the superheater increases the capacity of the boiler. Most locomotives, especially the older ones, are limited in their service by the amount of steam which the boiler will generate, so that a device which will do the same amount of work with, say, 25% less fuel, will obviously make a marked improvement, not only in economy and efficiency, but in the hauling power of the locomotive.

From a very large number of locomotives now equipped with superheaters in the United States, data are available which show conclusively their advantages. On many railways records exist showing that with the use of superheated steam several hundred tons of additional hauling capacity can be obtained from the

vertical alignment and also for distributing the stresses.

Question 7. Sizes of valves.—With superheated steam it is possible to use a smaller diameter of piston valve for the same size of cylinders than would be necessary for saturated steam. This is largely on account of the lightness of the superheated steam, which permits it to traverse the passages and ports at a much higher velocity. The sizes of piston valves used by a prominent locomotive builder in this country are as follows:

Cylinder Diameter.		
Valve	Saturated Steam.	Superheated Steam.
10 in.	17 in. to 18 in.	18 in. to 19 in.
11 in.	18 in. to 20 in.	19½ in. to 21 in.
12 in.	20 in. to 22 in.	21½ in. to 23 in.
14 in.	22 in. to 24 in.	23½ in. to 27 in.
16 in.	24 in. upward	27½ in. upward

Extensive tests were made by the Pennsylvania Rd. on the locomotive testing plant at Altoona to determine the limitations in the use of piston valves varying from 7 to 16 in. in diameter, on locomotives having 22, 24 and 25 in. diam. of cylinders. In all cases these tests were made with locomotives using superheated steam. The conclusions drawn from these tests led the Pennsylvania to adopt 12 in. diam. of valves for cylinders between 20 and 27 in. in diam., and for cylinders 20 in. and less, 8 in. diam. valves. Some of the conclusions drawn from these tests, are as follows:

"To establish a relation between the valve and cylinder so that the valve may be standardized, it may be stated generally that the diameter of the valve in inches for superheated steam should not be less than $0.016D^2$ where D = the diameter of cylinder in inches. The 12-in. valve is now used for cylinders between 20 and 27 in. in diameter, while for cylinders of 20 in. or less an 8-in. valve is used. Cylinders above 27 in. diameter have not been used for any class of locomotive of which there is more than one example, and a valve diameter for such cylinders need not be considered at present. Decreasing the valve diameter on a locomotive necessitates increasing the percentage of cut-off to obtain the same power at the same speed. This causes a longer valve travel."

From a maintenance point of view, it is of course desirable and economical for a railway to carry in stock as few diameters of piston valves as possible. These considerations doubtless led the Pennsylvania to adopt the 8 and 12 in. valves as standard to be used in new construction and reconstruction wherever possible.

These sizes adopted by the Pennsylvania are so much smaller than required by current locomotive practice in the United States, that some caution should be observed in adopting them without due consideration. For instance: The statement in the last paragraph of the conclusion, viz., calling attention to the necessity of an increase in percentage of cut-off with the smaller valve diameter in order to obtain the same power at the same speed, is significant, since it necessarily follows that the expansive force of the steam is not utilized as advantageously, and it would therefore appear that some decrease in economy would result.

The question of size of piston valves is of interest in the modernizing of existing locomotives, since many railways were committed to the use of slide valves because of their many recognized good qualities. With the general introduction of the superheater and its recognized necessity for modern locomotives difficulty was experienced in applying superheaters to locomotives equipped with slide valves, because a film of oil could not be maintained by ordinary methods of lubrication between the valve and its seat and to the deformation of the valve and its seat at the higher temperatures.

A steam chest containing a piston valve that can be applied to existing slide-valve cylinders has been designed, manufactured and tried on many leading railways. At present it is estimated that upward of 75 locomotives having slide-valve cylinders are equipped with superheaters, these steam chests and piston valves. The sizes of piston valves which have been used for this purpose are 8 in. diameter, with ports up to and including 19 in. in length; 9 in. in diameter, with ports 20 to 22 in. in length, and 10 in. in diameter, with ports exceeding 22 in. in length.

A novel method of applying outside steam pipes to piston-valve cylinders, used by the Southern Pacific Co. at its Los Angeles shops, is shown in the accompanying plan. It consists of cutting a hole $8\frac{1}{4} \times 17$ in. in the upper wall of the steam chest and dropping therein an integral finger-ring bushing fitted and bolted to place and afterward bored out for the bushings. The only steam-tight joint necessary for this finger-ring casting is where the bushings are pressed in. The fitting between the finger-ring bushing and the outside wall of the steam chest need not be steam-tight; only a solid bearing for bolting is required. We understand that a number of different

methods have been used for a similar purpose by other railways.

The report then reproduces the replies to the different questions received from the railways answering, and proceeds as follows:

Will the cutting up or scrapping of old locomotives continue at the same rate as in the past? This matter is related to the modernizing of existing locomotives, since the length of time that a locomotive can be economically kept in good working order is dependent largely upon its weight and capacity. A locomotive can be kept in working condition indefinitely by renewing worn out parts such as boilers, fire boxes, frames, cylinders, wheels, axles, etc. Thus a locomotive can be maintained in good serviceable condition, so that it would not be called worn-out, if renewals are made when necessary. Such a method of continuous replacement is economically possible, provided the locomotive is suitable and powerful enough for service. Before the end of the last century there were no large locomotives such as we are accustomed to see today. The tremendous increase in weight, size and power came in the first 15 or 16 years of this century. In many instances this increase in size of locomotives was in advance of the bridges and roadway, so that it was necessary to rebuild a large portion of the main lines in this country. Now that this has been accomplished and the roadbeds laid with heavy rails and provided with bridges of sufficient capacity to carry the heaviest wheel loads, it is a question whether the increase in weight and power of locomotives can take place as rapidly in the next 10 or 15 years as in the opening years of this century. Assuming this is the case, and that there will be no such tremendous increase in the power of locomotives for the next few years, it logically follows, then, that their life may be increased by renewals of parts. Therefore, instead of taking 20 as an approximation of the number of years a locomotive would last in service, the life of the large modern locomotive may be increased for a longer period. During this time it would be necessary to renew many parts, and it is also probable that many economical devices which would fall under the head of modernizing of existing locomotives could also be applied. It is therefore quite possible that a greater proportion of locomotives will be rebuilt or modernized in the future than in the past.

Report on Fuel Economy and Smoke Prevention.

The American Railway Master Mechanics' Association committee, William Schlafge, General Mechanical Superintendent, Erie Rd., reported as follows:—In its first report on fuel economy, your committee considered the subject generally, indicating the chief elements influencing the fuel supply cost, giving typical outlines of organizations for road supervision and briefly touching upon the effects of special appliances. The second report was chiefly devoted to instructions for enginemen and firemen, the other elements of the problem being touched upon lightly. In continuation of the subject, and as a logical sequence of the rules presented last year, it is proposed to consider the means through which the rules are to be applied and how the road supervision is to be selected, instructed and developed. In its last report your committee presented a pamphlet on

"Fuel Economy on Locomotives," which covers the fundamentals of all instruction methods, and, in order to make it practical and easily understood, it was made free from technicalities. But much of the advantage that should arise from rules and instructions will be lost if they are simply memorized without a thorough understanding of what they mean and how the principles are to be applied.

The road supervision must point out the results of improper methods and the advantage derived from an observance of the rules. The inexperienced fireman must be shown the effects of good firing, that he may learn through his own observation that the methods outlined produce the best results. He can then be instructed concerning the abstract theories of combustion, and it should naturally follow that practical application of these principles will be unconsciously

made. It should be the aim of the organization to accomplish its purposes through appeal to the man's appreciation of his increased efficiency, to the intelligent completion of his task and to that feeling of self-respect which arises from a sense of personal capability. If these measures fail, obedience to the rules for the routine performance of the fireman's task must be secured through the employment of such disciplinary measures as may be required. Fuel costs the railways in excess of \$170,000,000 annually and its use must be conserved.

Having outlined in a general way the course to be pursued, the question arises, What should govern the selection of a superintendent of locomotive operation, a travelling engineer, travelling fireman, or other road supervision. It seems trite to say that the effective instructor must have a knowledge of methods and pro-

cesses involved, and that he will be most efficient who has learned by the same means that he will employ in teaching others. Nor can any man pretend to occupy such a position who does not inform himself upon the best methods of producing the results sought, upon the underlying principles of his work and upon the advances that are made by other men in his line. The true instructor must be capable of placing himself in the position of the learner, must appreciate his difficulties and possess the ability to approach his task as though he were himself a novice. Knowledge of men is, of course, a prime essential. No leader can hope to succeed who is incapable of appreciating the problem introduced by the human element with which he has to deal. By familiarity with his duties, by the exercise of patient perseverance and by tactful consideration, the confidence of the men must be inspired. Co-operation must be secured or failure will result. The efficient instructor must be capable of overcoming his prejudices and conforming his ideas to progressive methods and appliances. His views must be sufficiently liberal to permit acknowledgment of his own deficiencies and to enable him to see wherein the methods of his contemporaries are productive of better results. This presupposes an active inter-

circular of inquiry, which showed that in general there were no definite methods of training road supervision, and this means that men are assigned to duty as road foremen or supervisors and left largely to their own resources, their work being judged by mechanical standards, to the exclusion of those features of economical operation which are daily becoming more pressing. The successful road foreman must produce reasonable economies in those expenditures for which he is properly responsible.

The lack of definite methods of selection is emphasized by the lapse of time which frequently occurs between the date of a vacancy and the appointment which follows, indicating that the question of succession had received little or no thought and that the qualifications of the candidates required review before the vacancy could be filled. In those circumstances, it is not surprising that mistakes are made which subsequently become embarrassing and are corrected with difficulty. The requirements of effective organization demand that local officers shall know and study individual engineers with a view to the vacancies which may occur, selecting for appointment those who have demonstrated by their work and their record that they are qualified for advancement.

or more engineers or firemen should be requested to come prepared to discuss one of the subjects of the meeting, prospective candidates for promotion being occasionally designated. These meetings, being of general educational value, may be made to serve a useful purpose in training future road supervision through the opportunity offered for presenting the aims and methods of the company with respect to the practical problems of economical locomotive operation; for a discussion of specific problems, with details of the sources of information bearing upon them and extracts therefrom, and for the correction of individual weaknesses by indirect methods, in order that character and efficiency may be developed.

On large systems, appointments to minor road positions, in order to obtain knowledge of the capabilities of the prospective candidates for appointment, can, and are, usually made by placing the men on special duty, and the results in this way should be followed up and the first few trips should be made in company with the road foreman or his assistant in order to observe the methods used in directing firemen and enginemen and the means employed to secure the co-operation of the men. On these trips the candidate should make the prescribed report, which can be checked and criticized privately by the officer whom he accompanied. After a number of such trips and an appointment has been made, the new supervisor should be accompanied by his immediate superior, who should, at the proper time, advise and counsel his subordinate concerning his work on these trips, particularly his manner of dealing with the men. Many men are ill fitted by temperament to occupy any supervisory position and, unfortunately, this in many cases can be determined only after trial, but it should be determined while the man is on probation and before appointment. Practical instruction should be accompanied by instruction in classes, which may include prospective candidates from two or more divisions, the respective road foremen acting as instructors. This work should include the special subjects that must subsequently be covered by the road foremen with the men, such as the details of the book on "Fuel Economy on Locomotives," the principles of combustion, locomotive design, the operation of special devices, care of the locomotive, and other related subjects. The head of the fuel department should be present at these instruction classes as often as possible, in order that his active interest may be appreciated and that he may counsel and advise his subordinates.

On the larger roads the employment of an expert instructor on locomotive operation and fuel economy is recommended, who should come under the head of the motive power department, and under his direction a special course should be provided for road foremen. The efficiency of such an instructor would probably be improved if he were provided with a car equipped for lecture purposes with a stereopticon and moving-picture machine, and such other apparatus as may be required to perform the simple experiments in combustion that are ordinarily used to illustrate the principles of good firing. On the smaller roads such instruction could be given by the head of the fuel department, the general road foreman of engines, or other officer of corresponding jurisdiction. The advantage in the use of lantern slides and classroom instruction arises not only because of the added interest aroused, but because it is easier to follow the lecturer, particularly where any statistics are presented. The fol-

A. B. C. RAILROAD CO.

Road Report—Engineer.

Division _____

Date _____

Eng. No. _____

Train No. _____

Service _____

Engineer _____

A. B. C. RAILROAD CO.

Road Report—Fireman.

Division _____

Date _____

Eng. No. _____

Train No. _____

Service _____

Fireman _____

RATING.

From	To	Reverse Lever.	Throttle Lever.	Injectors.	Locomotive Maintenance	Condition of Engine.

REMARKS.

RATING.

From	To	Condition of Fire.	Method of Firing.	Smoke, Tidiness.	Steam Pressure.	Safety Valves.

REMARKS

Examine in this form

Title of Officer Making Report.

1. Very Good. 2. Good. 3. Medium. 4. Poor.

Title of Officer Making Report.

est in the development of these devices that effect fuel economy and reasonable familiarity with the work of others in his field. A man occupying any supervising position must be of high moral character, for, no matter what his other qualifications may be, if he is immoral—if his time outside regular working hours is devoted to intemperance or to other vices that are the accompaniment of late hours and bad habits—his condition mentally and physically will fail to meet the standard of efficiency demanded of a high-grade organization and he will not command the respect of the men, which is essential to his success.

It should be unnecessary to say that your committee recognizes the fact that no one man combines in himself all the knowledge, experience and executive ability suggested as essential, but final selection must be governed by: Physical fitness, personal character, practical experience, knowledge of underlying principles, ability to demonstrate, capacity to impart information, and ability to adapt himself to progressive methods and appliances. Having enumerated the qualifications which the members of a high grade organization should possess, it is proposed to inquire in which manner the ideal may be approximated in actual development and training. That there is opportunity for such a discussion is indicated by the replies to your committee's

Having made a tentative decision as to those giving the greatest promise of development, special effort is required in following up the candidate, in checking his work and judging his efficiency. For this purpose the road foreman's trip report blank appearing in the appendix should be of assistance. This has been prepared in convenient form for the pocket with leaves in two sections, one for the engineer and one for the fireman, the pages being perforated to facilitate detachment so that they may be filed alphabetically. They will thus form a continuous and permanent record of the individual, from which his progress and relative standing may be judged. The forms have been prepared with the requirements of fuel economy in view, but other items may be added if desired. It is recommended that these reports be filed in the local division office of the road foreman, supervisor or master mechanic.

The final selection will be governed by a knowledge of the men, gained through personal contact and through occasional staff meetings. This will afford opportunity to determine the position of the men with respect to those policies for efficiency and economy which it is the aim of the company to promote. The subjects for staff meetings should be announced in advance, so that opportunity may be given for preparation. One

lowing are offered as typical subjects for treatment by lantern slides: Enginemen's work reports on arrival at terminals, showing actual samples of those properly made out with full information and those improperly made out. The diagrams on pages 10 and 11 of "Fuel Economy on Locomotives," including correct methods of cross-firing. Diagrams on pages 13 to 16, inclusive, of "Fuel Economy on Locomotives." These should be colored to bring out the effects of improper firing. Photographs of locomotives in operation, emitting dense volumes of smoke, indicating poor combustion. Photographs of locomotives with pops open, with rod packing blowing, and other miscellaneous steam leaks. Photographs of tenders properly and improperly coaled and trimmed. Charts and diagrams showing the relation of valve events to corresponding points on the indicator diagram. Indicator diagrams showing the coal and water consumed for equal work done with locomotives operating with full throttle and short cut-off, and with throttle partly closed and corresponding increased cut-off, so that the advantage of increased steam expansion can be clearly brought out. The chart on page 23 of "Fuel Economy on Locomotives," showing the variation in coal consumption with varying superheat at different cut-offs. Moving pictures may be made to indicate the correct methods of preparing fires, firing locomotives, and the results of improper practices in these particulars. Pictures of locomotives in operation, showing the influence of proper and improper firing upon the smoke emitted, may also be made extremely instructive.

The instructions given by the chief instructor on "Locomotive Operation and Fuel Economy" should cover the road foremen, assistant road foreman, traveling enginemen, etc., and at these instruction meetings the policies and aims of the organization should be formulated and the opportunity taken for a general discussion of important topics, as for example: Standards of divisional performance, and individual performance if possible; improved methods to be pursued; improvements of standard; methods of inducing employes to attain the standard; legitimate troubles experienced by the men; demonstration of methods to be employed, especially devices that produce economy.

It is the duty of the head of the organization to establish the standards by which the results of the divisions are measured, and to do this successfully it is necessary to have complete and accurate statements as to what can be done. Where individual performance sheets are employed, they might properly form the basis for divisional statements prepared on a gross ton-mile basis, or in the case of passenger service on a straight mileage basis. In all cases the best previous record must constitute the measure by which the results are gauged, and they must be interpreted with due regard for unusual conditions. It must be granted that results cannot be secured without comparisons. They are needed by the individual road foreman as a measure of his work and by the head of the department as a spur to the organization.

Every road foreman should be required to read at least one periodical monthly, dealing with railway matters, and the officer in general charge should have a list of the magazines to which his subordinates subscribe. This will permit special attention to be drawn to an article of unusual value appearing in any particular paper. Interest will be stimulated

if an opinion is occasionally asked on some article in a current number of a periodical and, when occasion affords, single marked copies may be distributed with a similar request. By this means each man should increase his knowledge, keep up with the developments in his line and acquire new ideas for instruction work.

Whenever possible, the head of the fuel department should attend meetings of the associations, particularly the Traveling Engineers and the Fuel Association, dealing with the subjects in which they are interested. He should be encouraged to take part in the proceedings, accept committee assignments and actively engage in the work of the associations. The advantages derived from attendance at association meetings require no elaboration in a paper before a convention whose membership is wholly in sympathy with the work of related organizations.

Finally, the road work must be constantly reviewed. It is necessary that a check be kept upon the road supervision and upon the locomotive crews. The trip reports should be examined and questioned, that effort may be stimulated and efficiency increased. To successfully effect the desired fuel economies, it is necessary that confidence and enthusiasm be developed, and this must be obtained through the influence of the general officers and the local supervision.

The subject of education and training for railway service has received no little attention from editorial writers and essayists, but there has been no general movement among the railways themselves for specific instruction of supervision in the operating department. The training of supervision constitutes preparation for subsequent increased efficiency. When a corporation undertakes to produce a commodity on a commercial basis, the processes of manufacture are carefully planned in advance, elaborate study is given the required equipment and the means through which the maximum efficiency may be realized. The results secured will be proportional to the care exercised in these preliminaries, as well as to subsequent operating efficiency. It is equally true of special education and training. The net results will depend upon the care with which the system is planned, the time spent in preparation of the supervision and the manner in which the preliminary training is subsequently applied. As the burden of railway operating expenses becomes constantly heavier, the necessity for economies becomes increasingly urgent, and the tendency is to restrict expenditures in those directions yielding direct results. The rapidity with which the transportation systems have developed has naturally resulted in obscuring the possibilities for indirect influence upon net returns, but your committee is confident that training for supervision in road service will receive that consideration to which it is entitled by reason of the relation which locomotive operation and fuel economy bear to the total operating expenses.

Smoke Prevention.—In connection with the problem of smoke prevention, your committee directs attention to the report of the committee of the Chicago Association of Commerce, on "Smoke Abatement and Electrification." The investigations conducted by this committee were continued over more than four years and reduced the subject to a scientific basis where the influence of locomotive operation upon smoke emission may be judged in its true proportion. There is given

below a table abstracted from the report, indicating the various classes of service responsible for air pollution.

Responsibility of Each Service for Smoke Pollution Within Chicago, on Percentage Basis.

	Visible smoke, Per cent.	Solids of smoke, Per cent.	Total of smoke, Per cent.	Gaseous carbon, Per cent.	Gaseous sulphur, Per cent.
Steam locomotives	22.06	7.47	10.31	10.11	18.22
Steam vessels	0.74	0.33	0.60	0.55	0.45
High pressure steam and heating plants	44.49	19.34	44.96	40.68	53.70
Low pressure steam and other stationary heating plants.	3.93	8.60	23.00	23.06	19.73
Gas and coke plants.	0.15	.....	.....	.....	.....
Furnaces for metallurgical, manufacturing and other processes	28.63	64.26	21.13	25.60	7.90

One-third of all air pollution is due to dirt other than that of combustion. These percentages refer to the remaining two-thirds. From this table it will be observed that steam locomotives contribute to:

	Per cent.
Visible smoke	22.06
Solid constituents of smoke	7.47
Gaseous constituents of smoke	10.31

The portion of the total visible smoke of Chicago which is chargeable to different locomotive services is interesting, and is as follows:

	Per cent.
Yard	10.25
Road freight	2.01
Freight transfer	4.59
Passenger transfer	.19
Through passenger	2.07
Suburban passenger	1.54
Locomotives at locomotive terminals	1.41

Total for steam locomotives 22.06

The proportions, while applicable only to Chicago, nevertheless indicate in a way the relations existing at other large terminals, and while the above report shows that the visible smoke produced by steam locomotives was only 22.06%, it suggests the necessity for further study in connection with the abatement of the smoke nuisance on engines in switching service. Your committee takes occasion to again draw attention to the recommendations contained in its report of 1913, wherein a type of apparatus for smoke prevention was described which had proved successful in extended practice. It is believed that the apparatus should at least be employed on all yard and transfer engines operating in congested city districts.

Canadian Railway Officials at Atlantic City.

Among the railway officials in attendance were the following:

Canadian Government Railways:—G. R. Joughins, Superintendent Motive Power, Moncton, N.B.

Canadian Northern:—W. C. Lancaster, Electrical Engineer, Montreal; A. L. Graburn, Assistant Superintendent Rolling Stock, Toronto.

Canadian Pacific:—H. H. Vaughan, Consulting Engineer, Montreal; C. W. Van Buren, General Master Car Builder, Montreal; T. G. Armstrong, Master Car Builder, Winnipeg; D. T. Main, Superintendent Motive Power, Montreal.

Central Vermont:—W. Gillespie, Mechanical Superintendent, St. Albans, Vermont.

Grand Trunk:—W. D. Robb, Superintendent Motive Power; J. Coleman, Superintendent Car Department; J. Hendry, Master Car Builder; A. A. Maver, Master Mechanic, K. F. Nystrom, Chief Draftsman, Locomotive Department, Montreal; T. Treleavan, Master Car Builder, London, Ont.; W. H. Sample, Master Mechanic, Battle Creek, Mich.; A. Copony, Master Car Builder, Elsdon, Ill.

Report of Committee on Design and Maintenance of Locomotive Boilers.

The American Railway Master Mechanics' Association committee, C. E. Fuller, Superintendent Motive Power, Union Pacific Rd., chairman, reported as follows:—This committee has been continued from last year's committee on design, construction and inspection of locomotive boilers. Last year a report was presented on methods of figuring stresses in locomotive boilers, which has since been adopted as Recommended Practice, bringing about for the first time a uniform and harmonious method of calculating the various stresses and safety factors on new locomotive boilers. That there may be misunderstanding as to the true intent of this work, the committee wishes to state that these formulæ are obviously intended for use in connection with designing new construction only, where there are no restrictions, and do not apply to existing boilers. This year circular K was issued, and replies received from 31 roads, which replies were tabulated and grouped for further study and analysis, the result of which your committee now presents for consideration in connection with the design and maintenance of locomotive boilers.

The modern locomotive being called upon to maintain high speed, with heavy and increasing train loads, and to meet greater demands for steam, the design and maintenance of boilers would seem to take precedence over any other part of the locomotive. That locomotive designers are aware of this seems evident from many of the replies received to the circular of inquiry, and the various means by which a number of roads are endeavoring to meet these conditions. Among the many devices tending to show the efforts in this direction may be mentioned a fire box which consists of squared water tubes, expanded into water and steam drums at the top and a water leg at the bottom, eliminating staybolts on the sides of fire box; a corrugated fire box; also the several types of water tube locomotive boilers; devices to improve the circulation around the fire box; various forms and adaptations of combustion chambers, either of the ordinary type or of special construction, having a bridge wall with air inlets. In some cases the adoption of combustion chambers has been due to a desire to avoid excessively long flues, while others have considered that the construction is desirable from its being inductive to longer flame travel, increasing fire-box temperatures on account of the more complete combustion obtained. The increase in the ratio of fire box volume and grate area is held to be beneficial, producing better steaming boilers, while the improved combustion has the effect of eliminating black smoke. It does not appear that the maintenance and repair with combustion chambers is greater than is the case with the ordinary construction, while the life of the flues is greatly increased by their use. There appears to be little experimental data on the relative evaporative performance of boilers with or without combustion chambers.

The fire box design being recognized as of paramount importance, there has been a general trend toward wider water spaces, about $4\frac{1}{2}$ to 5 in. for the sides and $5\frac{1}{2}$ to 6 in. at the front, being representative practice. Fire box door flanges have been given considerable attention, the majority of opinion favoring flanging the sheets toward each other; the joint in many cases being welded, with beneficial

results, from the elimination of rivets, with their tendency to collect mud. Some state that the welded method is cheaper than the riveted joint.

From the replies it is found that cross braces are used as a matter of necessity on Belpaire fire boxes and boilers with flattened surfaces, and to some extent on crown bar boilers.

The use of flexible staybolts, instead of tee bars and sling stays, to support the front end of fire box has become quite general, and the results have been satisfactory. In order to obtain proper bearing for flexible radial stays which are at a sharp angle with the wrapper sheet, one road reports having pressed out bosses in the sheet, while another road builds up bosses by autogenous welding. The results, giving sufficient full threads through the sheets for the bolts, have been very satisfactory.

Regarding venting crown sheet in case of low water, two members report that on coal-burning locomotives they omit the button heads on four front transverse rows of stays. Another member reports omitting button heads on the 6th, 7th, 8th and 9th rows back from the back flue sheets for the same purpose. The majority, however, do not make any allowance for this contingency.

Regarding the relative value of fire box and tube heating surface, there appears to be little data derived from tests. However, the accepted value assigned to fire box and flues, respectively, averages about 6 to 1, with special designs of fire box claiming a ratio as high as 12 to 1. The most effective ratio of fire box volume to grate area is indicated by the reports to be approximately from 5.5 or 6 to 1 for bituminous coal, and 4.5 or 4.85 to 1 for anthracite coal.

The use of long flues is not favored, for, while the total evaporative capacity of the boiler may be increased by their use, the rate of evaporation per unit area of heating surface is lower, and discounts the theoretical increase in capacity. In this connection tests show conclusively that there is a great variation in the evaporative value of the boiler tube, about one-half of the heat being transmitted in the first quarter of the tube length. It appears that a proportion of tube length to diameter of 100 times the inside diameter is most satisfactory. Longer tubes do not require any greater spacing than reasonably short tubes.

The addition of superheaters is practically unanimous, and all replies indicate that members will use superheaters on all new equipment, with the possible exception of some few roads which are not certain about switch engines. The ratio of superheating surface to total saturated heating surface seems to vary from .198 to .29, the average for modern power being about .27 to .29 for boilers with combustion chambers and .20 to .22 for boilers without combustion chambers.

In a general way it may be deduced that in modern practice the built up type of dome is being generally abandoned in favor of one piece pressed-steel domes. In regard to the elimination of boiler seams, no general effort has been made, although one member reports satisfactory results from combining the throat sheet and bottom half of last course. In almost all cases fire box sheets, as well as wrapper sheets, are made in one piece.

There does not appear to be any development along the lines of welding circumferential seams.

The support of the back end of the boiler above frames seems to be satisfactorily met by either expansion plates or by expansion shoes.

The use of cylinder volume as a basis in designing locomotive boilers, as outlined by this Association in the Proceedings of 1897, has, with the development of new and larger types of locomotives and superheaters, proved unsatisfactory, and your committee is of the opinion that better results are obtainable from ratios based on cylinder horse power.

The most interesting feature brought out by the committee in connection with boiler maintenance is the wide adoption of autogenous welding. The welding of flues into flue sheets, of fire box seams, and the application of patches varying in size from small crack and pitting repair plates to half side sheets and back heads, marks a radical and economical means of handling what has heretofore been a difficult and expensive problem. Both electric and acetylene welding processes have been used, but we are unable to determine which method gives the best results, as it seems to be largely a matter of opinion. Fire box seams have been welded successfully, one member reporting 14 engines with all seams welded by the acetylene process. Several roads report having side sheet seams welded, with little or no trouble experienced. Occasionally it has been necessary to re-weld a seam, on account of opening up.

Among the other uses to which the electric and oxy-acetylene processes have been put is in cutting off old smoke boxes, burning off stay bolts, instead of nicking and breaking them, and to loosen the caps on flexible staybolts to permit of easy removal without damaging threads. The autogenous processes of welding have recently been used to quite an extent for patching in fire boxes. Some of the replies indicate that welding can be done at about 40% of the cost of riveting; others report very little difference in cost. The methods of patching are still an experiment on most roads; others are reporting satisfactory results. The methods preferred seem to be a matter of opinion; the patches are of all shapes and sizes; some are welding by lapping the plates, others by beveling the patch and plate and filling in the groove, and others report patches being boxed out or bulged with a corrugation for expansion; but from the replies it is impossible to draw a conclusion as to the best way or method. Fire door openings have also been replaced by welding, with success.

The practice of welding cracks in the knuckle of flue sheet is quite extensively used, in most cases the welding being done on both sides of sheet. Two members cut out the crack and weld in a patch, but in the majority of cases the crack is filled up without patching. While some roads report welding in half side sheets and half back heads with satisfactory results, the practice has not yet become general. One member reports welding brick arch studs on side sheets of fire box, with success, but no welding-in of arch tubes has been reported.

The methods of safe-ending superheater flues, as reported, are rather uniform, the usual way being to cut off at the small end, scarf, apply safe end, and weld in flue welding machine. A few members report that they have welded safe ends by the electric or oxy-acetylene process. In this method, after scarfing, the flue and safe end are separated about

1/8 in. and the opening filled up, rotating the flue during the process. It seems to be accepted practice to avoid the use of more than one weld in a superheater flue at a time, which is accomplished by increasing the length of safe ends in successive applications, the old weld being cut off and a longer safe end used. Few roads weld safe ends to the enlarged portion of the flues. Results are in most cases reported as being satisfactory. The usual practice in setting tubes appears to be, for the back end, to insert a copper ferrule in the hole, then roll, expand and bead the flue, after which the point is cleaned and welded lightly on the edge of the bead. One member reports that copper ferrules are not used, nor flue beaded, but welded in by the electric process, which is indicated to be the most generally used in this class of work. Flues in the front flue sheet are not welded, but rolled, and about 10% beaded.

While a few roads are rebuilding old locomotives and converting consolidation types to mikados, and prairie types to Pacific types, there is no general trend in this direction. Many roads are applying superheaters to their more modern types of saturated locomotives, and in some cases at the same time eliminate old styles of staying, bracing, etc. The application of combustion chambers, brick arches and outside valve gear has been reported by several members. On engines having cylinders smaller than 20 in. diameter, it has not as a rule been considered advisable to apply superheaters.

In view of the development of the locomotive, it is our opinion that the ratios of 1897, being unsuitable, should be superseded by a method of calculation which will meet the variable conditions imposed by modern practice. The reports indicate a wide departure from the Recommended Practice of 1897. Ratio of grate area in square feet to volume of two cylinders in cubic feet, for simple passenger or freight locomotives, should not be less than: 4 for large anthracite coal. 9 for small anthracite coal. 3 for bituminous coal. From the replies received, for modern power these ratios have been increased 23%. The ratio of heating surface in square feet to grate area in square feet, for simple passenger and freight locomotives, should not be less than: 40 for large anthracite coal. 20 for small anthracite coal. 60 for bituminous coal. From the replies received, for modern power these ratios have been increased 28%. The ratio of heating surface in square feet to volume of two cylinders in cubic feet, for simple passenger or freight locomotives, should not be less than: 180 for large anthracite coal. 200 for small anthracite coal. 200 for bituminous coal. From replies received, these ratios for modern power have been increased 34%. We would, therefore, submit for adoption as Recommended Practice the following ratios based on cylinder horse-power: D, Diameter of cylinder. P, Boiler pressure. A, Area one cylinder diameter. H-p, Horse-power. TP, Tractive power. D, Diameter of drivers. S, Stroke in inches.

1. From weight limitation on drivers, and from service, type, etc., obtain the required tractive power.

2. From tractive power, boiler pressure, stroke and size of drivers obtain diameter of cylinder.

$$D = \sqrt{\frac{TP \times d}{.85 \times P \times S}}$$

$$D = \sqrt{\frac{.85 \times P \times S}{TP \times d}}$$

$$H-p = .02120 \times P \times A \text{ — saturated steam.}$$

$$H-p = .02290 \times P \times A \text{ — superheated steam.}$$

Maximum horse-power assumed to be reached at the following piston speeds: Saturated steam ... 700 ft. per minute. Superheated steam... 1000 ft. per minute.

The following figures are based on reports from various testing plants and road tests made under different conditions, and are liberal and can be more than met under favorable conditions:

3. Estimate total steam per hour from:
H-p. \times 27.0—saturated steam.
H-p. \times 20.8—superheated steam.

4. Estimate total coal per hour from:
H-p. \times 4.00 lb.—saturated steam
H-p. \times 3.25 lb.—superheated steam, based on coal containing 14,000 B.T.U. per pound, using a percentage factor for poorer or better grades of coal.

5. Estimate size of grate from total coal divided by 120, or

$$\text{Grate area} = \frac{H-p.}{30} \text{ — saturated steam.}$$

$$\text{Grate area} = \frac{H-p.}{36.9} \text{ — superheated steam.}$$

6. Estimate evaporation of fire box, including combustion chamber and arch tubes, if used:

$$\text{Sq. ft. fire-box heating surface} \times 55 = \text{evaporation in lb. per hr.}$$

7. Subtract (6) from (3) to obtain tube and flue evaporation required. Base evaporation on 10 lb. water per hr. per sq. ft.

8. To obtain percentage of boiler, divide total pounds of steam proposed boiler will evaporate by these formulae pounds of steam required.

9. The ratio of fire-box volume to grate area should be about 5.5 or 6 to 1, for bituminous coal; 4.5 or 4.85 to 1, for anthracite coal.

The ratio of length to diameter for tubes should be about 100 to 1 \times internal diameter, which for 2-in. tubes would give a length of about 16 ft. and for 2 1/4-in. tubes about 18 ft.

The ratio of superheating surface to total saturated heating surface should be, without combustion chamber, about .22, and with combustion chamber about .29.

The methods of figuring stresses in locomotive boilers, adopted as Recommended Practice last year, with the ratios submitted in this report, will place in the hands of the members a basis for locomotive boiler design which, meeting all modern conditions, will doubtless have the effect of improving the present variation in methods.

Your committee has been greatly impressed by the possibilities of the processes of autogenous welding for boiler maintenance. We would offer as a suggestion that a committee of this Association be appointed for the purpose of assembling and analyzing all available information on this important subject, with a view to arriving at standard methods of using the processes, and to develop further the present largely experimental work along this line.

In conclusion, your committee wishes to express its appreciation for the assistance which the members have given them in furnishing information relative to their practice.

C.P.R. employes on the Ontario Division have subscribed a further \$800 to the Toronto and York County Patriotic Fund, making a total of \$8,600 since Sept. 1915. A large number of the employes are also subscribing four days pay during the year, which it is expected will realize about \$55,000.

Election of Railway Mechanical Association Officials.

The following elections took place at Atlantic City:

American Railway Master Mechanics' Association.—President, Wm. Schlafge, Erie, Rd.; 1st Vice President, F. H. Clark, Baltimore and Ohio; 2nd Vice President, W. J. Tollerton, Chicago, Rock Island and Pacific; 3rd Vice President, C. F. Giles, Louisville and Nashville; Treasurer, Angus Sinclair. Executive Committee: J. Purcell, Atcheson, Topeka and Santa Fe; M. K. Barnum, Baltimore and Ohio, and W. E. Dunham, Chicago and Northwestern. M. A. Kinney, Hocking Valley, was elected to serve on the executive committee during J. F. De Voy's unexpired term.

Master Car Builders Association.—President, C. E. Chambers, Superintendent Motive Power, Central Rd. of N.J.; 1st Vice President, T. W. Demarest, Superintendent Motive Power, Pennsylvania Lines West, Northwest System; 2nd Vice President, James Coleman, Superintendent, Car Department, Grand Trunk; 3rd Vice President, G. W. Wildin, Mechanical Superintendent, New York, New Haven & Hartford; Treasurer, J. S. Lentz, Master Car Builder, Lehigh Valley. Executive Committee: S. Lynn, Master Car Builder, Pittsburg & Lake Erie; J. C. Fritts, Master Car Builder, Delaware, Lackawanna & Western; C. B. Young, Mechanical Engineer, Chicago, Burlington & Quincy.

Railway Supply Manufacturers Association.—President, E. H. Walker, Standard Coupler Co.; Vice President, Le G. Parish, American Arch Co.; Executive Committee: W. Beaver, Yale & Towne Mfg. Co.; G. Thompson, Edison Storage Battery Co.; W. McConway, Jr., McConway & Torley Co., G. A. Cooper, Frost Railway Supply Co., R. Carr, Dearborn Chemical Co.

St. John & Quebec Ry. Contractor's Suit.—A Quebec court on June 14, dismissed the action brought by F. A. Hibbard against A. D. Gould, President, St. John & Quebec Ry., before it was taken over by the New Brunswick Government, to recover \$10,000, being the amount of the transfer of his interests in the Hibbard Construction Co., and the St. John & Quebec Ry. Co. for the construction of a part of the railway between Fredericton and Woodstock. The defendant had refused to complete his contract, claiming that the representations made by Hibbard were incorrect. After hearing evidence the court dismissed the action.

Comparative Average Railways Costs.—There are 198,554 miles of railway in Europe, with a total capital cost of \$25,059,644,889, showing an average cost per mile of \$126,211. The United States has 235,815 miles, with total capital cost of \$15,719,696,925, or an average cost per mile of \$66,661. The U.S. mileage only included railways with \$100,000 or more gross annual income, so that a further 8,440 miles may be added, with \$197,486,000 capital cost, reducing the average capital cost to \$65.166 per mile.—Bureau of Railway News and Statistics.

The C.P.R. General Superintendent's office at Calgary had, when war began, a staff of 23 male clerks and several female clerks and stenographers. Fifteen of the men have enlisted, 10 of them are at the front, 1 is in England and 3 are training in Calgary battalions, 2 are lieutenants in British regiments, 2 are staff sergeants, 2 are corporals and the others are privates.

Examinations Among G.T.R. Motive Power Department Apprentices.

The annual examination of apprentices employed in the G.T.R. motive power department has been completed recently, and awards made in the various competitions connected therewith. For the purpose of fair competition, the 26 stations at which instruction is given throughout the year were divided into four groups, according to the number of apprentices employed at each station. Each group competed for class and individual prizes aggregating \$450. The examinations were set in drawing and mathematics, according to the year of apprenticeship, and were based as nearly as possible upon problems likely to arise throughout the shop work. The following questions are taken from each of the five papers, and serve to convey an idea of the work accomplished:

"A $\frac{5}{8}$ in. drill when drilling cast iron should make 608 r.p.m. At what speed should a $1\frac{1}{2}$ in. drill be run to give the same cutting speed?"

"A power plant used 4 tons of coal in one day, 9 lbs. of water being evaporated by 1 lb. of coal. The feed water consumption was 25% greater on this day than on the preceeding day. How much water was evaporated during the preceeding day?"

"How much weight can an air hoist lift whose efficiency is 79% if the cylinder is 18 in. dia., and the air pressure is 75 lb. per sq. in.?"

"The ratio of 2 pulleys is as 5 to 3. The first makes 105 r.p.m. How many r.p.m. does the second one make? If the second pulley is 27 in. dia. find belt velocity."

"What diameter safety valve is required in order that it acts when a pressure of 200 lb. per sq. in. is reached the total pressure then upon the valve being 1790 lb.?"

Detailed blue prints of parts of a locomotive were given in the drawing competitions, and it was required to make a complete assembled drawing from the details.

To the individual in each year who made the highest combined score a special capital prize was awarded, and in one case a score of 196, out of a possible 200, made up of 98 marks in each subject, won the prize. In one or other of the subjects there were scores of 100, but lower points in the other subject prevented these scores capturing the high prize.

The winning stations in the various groups were as follows:—Group A: 1st, Stratford; 2nd, Battle Creek. Group B: 1st, Sarnia; 2nd, Toronto. Group C: 1st, Allandale; 2nd, Belleville. Group D: 1st, Port Huron; 2nd, Hamilton.

The capital prize winners in group A (main shops) in the different years are as follows:—1st Year: A. Anderson, Stratford. 2nd Year: W. Leask, Montreal. 3rd Year: W. Davis, Stratford. 4th Year: A. McDowell, Stratford. 5th Year: N. Smith, Montreal.

In addition to the above, apprentices in groups B, C and D (roundhouse classes) competed for capital prizes for highest combined scores; W. Hess, of Port Huron, coming 1st, and C. O'Neill, Sarnia; W. Pearce, Belleville; and C. Foss, Island Pond, coming next in the order named.

These competitions are eagerly looked forward to and are the means of encouraging closer studies on the part of the boys, in order that their respective stations may have the honor of coming out ahead. The keen interest taken in

everything pertaining to apprentice matters, by the officials of the motive power department, permeates the whole system, and means that an apprentice serving his time with the G.T.R. is insured of a practical as well as a thorough theoretical training.

Canadian Northern Railway Station for Vancouver.

The new station about to be erected by the Canadian Northern Pacific Ry. at False Creek, in the centre of the City of Vancouver, will be fireproof and up to date in every respect. It has been designed along dignified classic lines, with a strong central arched feature and supporting features at the extreme corners. The total frontage will be 321 ft. with a depth of 105 ft. It will contain a basement and three stories above street grade.

The ground floor will contain a large general waiting room and ticket lobby, immediately adjacent to which and entering directly from it, will be waiting rooms for men and women, dining room and lunch counter, barber shop, ticket office for rail and steamship, commercial telegraphs, hand baggage, general baggage, government mail, express and sleeping and dining car departments, etc. The two upper floors will accommodate the company's general offices in Vancouver. There will be elevator service to all floors.

Directly in front of the main entrance, on the opposite or rear side of the station, will be situated doors leading to a covered concourse 50 ft. wide, running along the entire length of the rear of building. From this concourse access to the various train platforms will be had. These platforms will also be covered. In all there will be 16 tracks leading into the station and the average of the platforms will be about 1200 ft.

The building will be amply supplied at all points with natural light and ventilation, the form of the building on the upper floors, permitting of direct light and air to all rooms and corridors. The large waiting room, which will have a lofty ceiling, will be lit not only from the top but also by means of clerestory lights on three sides, which will also afford splendid natural ventilation.

Externally the front and both side walls will be constructed of granite up to base, and above, in stone, both of which materials will be procured locally. The general waiting room will be finished in marble about 6 ft. up, above which Caen stone will be used to ceiling, the latter to be panelled in ornamental plaster. The floors will be finished in terazzo. Marble will also be used in all corridors and lavatories, with terazzo floors. It is the intention as far as practical to use British Columbia materials in the construction.

The general scheme also calls for the construction at once of freight offices, with freight shed, and the usual trackage and teamway facilities for the rapid handling of this branch of the business.

The cost of the passenger station, with its concourse and platforms, will be about \$1,000,000. The architects are Pratt & Ross, of Winnipeg and Vancouver.

Auditing of Railway Accounts. In connection with the loans to the Canadian Northern and Grand Trunk Pacific Railways, authorized at the Dominion Parliament's last session, the Dominion Government has appointed Marwick, Mitchell, Peat & Co., to audit the C.N.R. accounts, and Price, Waterhouse & Co. to audit the G.T.P.R. accounts.

Railway Accommodation for Camp Borden.

The laying out by the Dominion Government of the new military camp, named after the Premier of the Dominion, in Simcoe County, has necessitated the building into it of two spur lines, one from the C.P.R. and the other from the G.T.R. The camp lies in the section of Simcoe County through which the Pine River runs, north and east of the G.T.R. line from Beeton to Collingwood, south and west of the G.T.R. line from Allandale to Collingwood, and west of the C.P.R. Toronto-Sudbury line. The two last mentioned lines are the most convenient for access to the camp.

The C.P.R. has built its spur line from Ypres, 57.3 miles from Toronto. It runs for 1.75 miles on the company's own right of way, and then for 2 miles on the Government lands, connecting up with the Government tracks. The building of the line was an exceedingly simple piece of work, there being no gradients to amount to anything, and no bridgework of importance. It was done by the company's own forces. A station building and siding accommodation is being provided. From Toronto to the camp there are 4 trains each week day, 3 extra trains on Saturdays, 1 extra train on Tuesdays and Thursdays, and 3 trains on Sundays. From Camp Borden to Toronto there are 4 trains each week day, 2 extra trains on Saturdays, 1 extra train on Mondays and Thursdays, and 4 trains on Sundays. The running time varies from $1\frac{3}{4}$ hr. to 2 hr. 40 min.

The G.T.R. spur line starts from Angus, 10.60 miles from Allandale, and is 4 miles long, the station being 2.6 miles from Angus. Two sidings, each half a mile long, have been laid at the station; there are also 5 spur tracks for the Ordnance and Army Service Corps, each spur being about 1,600 ft. long, and a 1,900 ft. Y at Angus for turning trains. There is a summer station 400 ft. long, with platforms 800 ft. long, nearing completion. Construction work was started May 11, and was reported to be practically completed June 15. A train service was put in operation June 1, consisting of the Camp Special, leaving Toronto at 6.40 a. m., reaching the camp at 9.10 a. m. and returning at 6 p. m., reaching Toronto at 8.30 p. m. Additional service was to be put on during the march. Special trains are being operated between Allandale and the camp and between Collingwood and the camp.

The Government lines include a belt line round the central part of the location, with spur sidings as required, with which both the C.P.R. and the G.T.R. lines are connected.

A G.T.R. Conductor's Appeal.—Judgment has been reserved in the appeal of Conductor Sinclair against a conviction in the Toronto police court last March for theft of money from the company. The appeal was based on the ground that the conductor received cash from persons travelling on the trains, as a bribe, and not for fares, and it was contended that, if that were so, the cash was not the property of the company, and was therefore not stolen.

Ticket Agent Found Guilty of Treason.—Israel Schaefer, a general ticket agent at Montreal, after a second trial was found guilty of treason there, June 20, having supplied tickets to Austrian subjects at the outbreak of the war; thereby "assisting the King's enemies."

Collection of Demurrage at Destination.

S. J. McLean, one of the commissioners of the Board of Railway Commissioners, gave the following judgment recently:

The Security Traffic Bureau of St. Paul, Minn., submits papers in connection with a claim which it has presented to the Canadian Freight Association on behalf of one of its clients. The essence of the claim is this: At the time the shipment moved in 1912 the car service charge was \$1 a day. Subsequent to the date of shipment, the Board's order 18178 of Nov. 30, 1912, was issued. This authorized for a limited period a car service charge of \$2 for the first 24 hours or any part thereof, and \$3 for each succeeding 24 hours or any part thereof, for delay beyond the free time allowed for loading and unloading the cars. Applicant contends that the charge should be \$1 a day, it being stated that this was the authorized rate in effect at the time the bills of lading were issued. Applicant points out that the bills of lading contain the provision—"Received, subject to the classification in tariff 'in effect on day of issue of this original bill of lading.'"

Under the Car Service Rules, free time is allowed for loading and unloading as well as for certain other services therein specified, and provision is made as to when the free time shall begin. The carrier is obligated under the contract of carriage to take the car to a given destination. When the notice has been given or the car has been placed and such free time has been allowed as the Board under the Car Service Rules has approved as being reasonable for the purposes of loading or unloading, etc., the obligations of the carrier under its contract of carriage have ceased. The car service charges for the excess time are, therefore, independent of the tariff applying on the shipment, and, consequently in the case presented, the car was liable to the car service charge in force at the time of its arrival at destination.

Reference may be made to the practice of the Interstate Commerce Commission under its Conference Ruling 405, where it provides in respect of demurrage rules that the rules in effect at the time the shipment arrived at demurrage point must control. By its Conference Ruling 473, it provides that demurrage and storage in transit are controlled by the tariff in effect when the initial movement begins, but that demurrage and track storage at destination are controlled by the tariff in effect when the car is actually or constructively set for unloading.

The Canadian Northern Ry. appeal to the Supreme Court at Ottawa against the award of Judge Cassels in the Exchequer Court of \$166,000 as damages against the Dominion in connection with the entry of the National Transcontinental Ry. into St. Boniface, Man., has been dismissed. The C.N.R. claimed that the lands it owned at St. Boniface had been depreciated in value to the extent of from \$2,500,000 to \$10,000,000 by the construction of the N. T.R. The appeal was argued at Ottawa May 2.

The Minister of Labor has informed the machinists and other striking employees of the Toronto, Hamilton & Buffalo Ry., that the representatives of the men, the company and the Government having agreed upon an award, under an arbitration in conformity with the act, the Department can do no more, and that it is the duty of the men and the company to get together.

Transportation Course and Scholarships at McGill University.

A circular issued by George Bury, Vice President, C.P.R., in reference to 2 free scholarships covering 4 years tuition in the Faculty of Applied Science in McGill University, Montreal, which are offered, subject to competitive examination, to apprentices and other employees enrolled on the company's permanent staff and under 20 years of age, and to minor sons of employees, was published in Canadian Railway and Marine World for June. For some years the C.P.R. has been giving a course at McGill to 5 of its employees, or sons of its officers or employees, and after the session of 1916-17 this will be increased to 10. All the students taking advantage of this course will be required hereafter to qualify in chemistry, civil, mechanical or electrical engineering. The company will bear the expense of these courses, and they will be open to any employee or the son of any official or employee who may qualify.

For some years past the Canadian Pacific and Grand Trunk have contributed largely to the expense of the transportation course at McGill, which will come to an end with the session of 1916-17. The G.T.R. has withdrawn its grant this year, and it is said that the C.P.R. will do the same. The course will be given next session only to 4th year students, who will be allowed to finish their course.

Litigation Respecting the Pacific Great Eastern Railway.

A unique action has been taken by the leader of the opposition in the British Columbia Legislature, in connection with the legislative action respecting the P.G.E.R. He first submitted a motion to the Legislature asking that legal proceedings be taken by the Attorney General against certain persons, under the Criminal Code, sec. 160, for the manner in which the money received for the sale of the P.G.E.R. guaranteed securities had been paid out. The statute guaranteeing the securities provided that their proceeds should be paid out as the work progressed "in the proportion of work done and materials and supplies purchased for the said railway as compared with the whole work done and to be done thereon, pending completion of the said line," and the motion submitted alleged that \$18,035,198.53, the entire amount received from the sales of the guaranteed securities, had been paid over while \$18,803,805.59 had been expended on the line, which was only partially completed. The motion was defeated by 30 votes to 4; and a subsequent motion, asking that the Lieutenant Governor appoint a royal commission to investigate all matters connected with the construction of the railway, was also negatived. In the writ, issued June 1, it is alleged that the act granting a loan of \$6,000,000 to the company to complete the line is invalid on the ground that the Legislature legally expired Mar. 15; and that the payment of a large portion of the \$18,000,000 odd to the company was a breach of trust. The action is regarded as a move in the provincial political game.

The Train Dispatchers' Association of America held its 29th annual convention at Toronto, June 20 to 22. About 200 members were present on the opening day, and were given a civic reception by the Mayor and council.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, for Western Lines, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$1,206,100	\$921,000	\$285,100	x\$145,400
Aug.	1,192,800	954,000	238,800	x5,900
Sept.	2,014,500	1,358,000	661,600	1,900
	\$4,413,600	\$3,227,000	\$1,186,600	x\$79,300
Decr.	\$658,300	\$579,000	\$79,300	.....

x Decrease.

Mileage in operation at Sept. 30, 1915, 4,965, against 4,670 at Sept. 30, 1914.

Commencing with October, the figures show the earnings of the entire system, both eastern and western lines.

	Gross Earnings	Expenses	Net Earnings	Increase
Oct.	\$3,678,500	\$2,421,500	\$1,257,000	\$537,800
Nov.	3,535,200	2,323,800	1,211,400	618,400
Dec.	3,435,600	2,233,500	1,202,100	768,900
Jan.	2,086,800	1,331,400	755,400	88,100
Feb.	2,089,200	1,959,800	129,400	x193,500
Mar.	2,607,000	2,240,600	366,400	x134,800
Apr.	2,824,300	2,274,400	549,900	5,500
	\$26,958,900	\$20,133,300	\$6,825,600	\$1,847,700
Inc.	\$5,906,200	\$4,058,500	\$1,847,700	.....

x Decrease.

Average mileage in operation at Apr. 30, 7,824, against 6,974 for the same period of 1914-15.

Approximate earnings for May, \$3,088,900, against \$2,721,400 for May, 1915, and for three weeks ended June 21, \$2,254,400, against \$1,226,700 for the same period 1915.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$7,896,375.47	\$5,094,972.35	\$2,800,403.12	\$978,042.71
Aug.	8,801,351.52	5,359,136.80	3,442,314.72	79,157.02
Sept.	10,273,165.45	5,527,864.81	4,745,300.64	378,252.25
Oct.	13,433,206.88	6,863,780.29	6,579,426.59	3,258,105.79
Nov.	13,351,283.51	6,996,870.48	6,354,413.03	3,710,340.86
Dec.	12,705,673.45	7,003,351.97	5,702,321.48	3,502,797.67
Jan.	8,588,826.04	6,498,417.81	2,090,408.23	954,174.93
Feb.	8,795,830.30	6,501,487.56	2,294,342.74	315,328.12
Mar.	10,380,981.98	6,959,651.62	3,421,330.36	448,315.63
Apr.	10,881,306.37	7,147,570.40	3,733,735.97	1,045,980.76

\$105,117,108.53 \$63,953,104.09 \$41,164,004.44 \$12,170,410.32
Inc. \$21,025,428.31 \$8,315,017.99 \$12,710,410.32

Approximate earnings for May, \$12,187,000, against \$6,996,000 for May, 1915, and for three weeks ended June 21, \$7,934,000, against \$4,827,000 for same period 1915.

Grand Trunk Railway Earnings.

Following are the earnings and expenses for the G.T.R., including the Canada Atlantic Ry., the G.T.W.R. and D.G.H. and M.R., for April, compared with those for April, 1915:—

Grand Trunk Railway.			
	1916.	1915.	
Earnings	\$3,585,000	\$3,200,000	
Expenses	2,344,000	2,032,800	
Net earnings	\$1,241,000	\$1,167,500	
Grand Trunk Western Railway.			
Earnings	\$ 820,700	\$ 609,250	
Expenses	671,400	590,500	
Net earnings	\$249,300	\$17,750	
Detroit, Grand Haven and Milwaukee Ry.			
Earnings	\$ 280,000	\$ 197,200	
Expenses	252,200	205,000	
Net earnings	\$27,800*	\$7,800	

*Deficit.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1 to Mar. 31.—			
	1916	1915	Increase
G.T.R.	\$17,128,159	\$14,971,617	\$1,157,142
G.T.W.R.	3,738,626	2,850,836	887,790
D.G.H.&M.R.	1,310,609	961,518	349,091
	\$22,177,964	\$18,783,971	\$3,394,023

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section, 916 miles, for May, were \$422,385, against \$211,772 for May, 1915, and the aggregate for five months ended May 31 was \$1,941,586, against \$1,135,445 for same period 1915.

Final Judgment in the Rogers Pass Tunnel Suit.

The case of McIlwee vs. Foley et al is of such great importance to engineers and contractors generally that we feel it important to devote considerable space to it. The plaintiffs are J. A. McIlwee & Sons, of Denver, Col., and the defendants Foiey, Welch & Stewart, to whom the C.P.R. let a contract with the defendants for boring connecting lines at Rogers Pass, B.C. In the particulars of claim published in Canadian Railway and Marine World for Dec., 1914, pg. 542, the plaintiffs set out that as sub contractors they entered into a contract with the defendants for boring a five mile tunnel, the defendants to provide tools, mules, equipment, air for ventilation and other drilling purposes and to make monthly advances on account of work done. The plaintiffs undertook to drive 900 ft. a month and were to receive a bonus of \$1,000 for every foot of tunnel driven beyond the 900 ft. a month, the total bonus to be earned not to exceed \$250,000. Work was started April 2, 1914, and so much was done that early in September plaintiffs claimed to have earned \$215,076 on bonus account. The plaintiffs allege that the defendants then began to hinder them in their work and that after considerable friction the general contractors annulled the sub contract Sept. 24. Plaintiffs' claim was made up as follows: Bonus earned, \$215,076; bonus which they were prevented from earning, \$34,924; loss of profit on contract for pioneer tunnel, \$125,325; loss of profit on contract for centre tracking, \$164,036. When the case was heard before Mr. Justice Clement, plaintiffs were awarded \$32,000 as damages, at the rate of \$600 a day unearned profits from the time of stoppage of work until Oct. 9, 1914.

Both the plaintiffs and defendants appealed from the judgment and the B. C. Court of Appeal on Aug. 10, 1915, allowed the McIlwee appeal in full with costs and dismissed defendants' appeal. A majority of the court found that McIlwee & Sons were entitled to the full amount of the bonus claimed and also to all the damages for loss of profits they could show on reference to the trial judge. Subsequently leave was granted to amend the statement of claim in accordance with this finding and this was done, the total claimed for bonus and damages being put at over \$800,000. Foley, Welch & Stewart then appealed to the Judicial Committee of the Imperial Privy Council, which has unanimously sustained the B.C. Court of Appeal's judgment.

The Privy Council's Judgment.

The appeal to the Judicial Committee of the Imperial Privy Council was heard by Earl Loreburn, Lords Atkinson, Parker of Waddington and Spenser. Earl Loreburn delivered the committee's judgment as follows:

"This is a dispute arising out of a contract between Foley Brothers and McIlwee and Sons. Messrs. McIlwee, who are the plaintiffs, agreed to construct a tunnel some 5 miles long. It would be necessary to make the tunnel from both ends. In Sept. 1914, a quarrel arose between Mr. Dennis, who was acting on behalf of Foley Brothers, and Mr. McIlwee, acting on behalf of his firm. Mr. Dennis in his haste sent a notice cancelling, at all events, part of the contract, and he also thereupon stopped the supply of air which was necessary to enable the work to continue. After some fruitless interviews, Mr. McIlwee broke up his staff, and treated the contract as ended, inasmuch as the action and the notice of

Mr. Dennis went to the very root of the contract. Their Lordships feel no doubt that the letter of Sept. 24 containing the notice and the action of Foley Bros. through Mr. Dennis justified Messrs. McIlwee in treating the contract as having been repudiated in respect of matters going to the root of it. The work was in fact discontinued by Messrs. McIlwee because of the action of and the notice that had been given by Mr. Dennis. An argument was addressed to the Board to the effect that the discontinuance of the work and the cancellation or annulment of the contract was due to a common agreement by both sides. This view seems to be quite untenable. It did not commend itself either to the trial judge or the Court of Appeal, and it is not necessary to elaborate the facts bearing upon that issue.

"Messrs. McIlwee thereupon brought an action, and certainly are entitled to damages; but an important question has been raised upon what principle those damages ought to be assessed. With regard to that matter, the trial judge, Mr. Justice Clement, and the Court of Appeal differed, and it is desirable to explain how that difference arose. The unwisdom of Sept. 24 had hardly been written, and action hardly taken, before the author of it appeared to have had some misgivings, and he wished and his principals wished that the contract should be continued. Messrs. McIlwee, for obvious reasons, were anxious to continue the contract, but seem to have been annoyed at the treatment they thought they had unjustly received. Thereupon two offers were made by Mr. Dennis on behalf of Foley Bros. He offered upon Oct. 9 that the work should be continued, and that Foley Bros. should pay damages up to date. At this time the workmen originally engaged had been discharged by Messrs. McIlwee and part of the staff—nearly all apparently—had been disbanded. Of course, the damage arising from the breach of contract might continue beyond the date of Oct. 9. Messrs. McIlwee professed to be ready to renew the contract, but were uncertain as to whether the terms of the offer included damage which might occur after Oct. 9. They could not obtain any assurance that this was intended, or that this was offered, and they would not renew the contract without being satisfied upon that point. The Court of Appeal thought this was reasonable; their Lordships agree with that view, and must regard the letter of Oct. 9 as being, to say the least, doubtful in construction.

"The second offer was made upon Nov. 10, by which time five more weeks had elapsed, and Messrs. McIlwee had now been kept from work for six weeks. The offer by Foley Bros. amounted to this—that they would pay all damage of every kind arisen or to arise from the breach, and would restore the terms of the old contract. By this time it had become necessary that considerable modifications should be made in the old contract to meet the new situation, as regards the time, for example, and other matters. Messrs. McIlwee expressed their demands in a letter of Nov. 11. If any legal adviser, by which is meant any person competent to give an impartial opinion upon this contract, had been asked in regard to this letter of Nov. 11, their Lordships think he would have said there must be considerable modification in the contract before any renewal could be advised, and

that he could not advise a renewal unless the points raised in that letter were cleared up and satisfactorily settled. In point of fact when the letter was received it was not treated as being a basis of settlement, and the offer of Nov. 10 came to nothing. The Court of Appeal thought that this was not unreasonable conduct on the part of Messrs. McIlwee, and their Lordships are not prepared in any way to differ from that opinion.

"Perhaps it would be advisable to say one or two words in view of some of the expressions that have been made use of in the judgments. Their Lordships think that the quotation by Mr. Justice Gallihier from the judgment of Lord Chief Justice Cockburn in the case of *Frost v. Knight*, L.R. 7 Ex. 111, 41 L.J. Ex. 78, truly expresses the law. The Lord Chief Justice, in speaking of the event of one person treating a contract as broken and suing at once for breach of it, says: 'He will be entitled to such damages as would have arisen from the non-performance of the contract at the appointed time * * * and in assessing the damages for breach of performance a jury will of course take into account whatever the plaintiff has done, or has had the means of doing, and, as a prudent man, ought in reason to have done, whereby his loss has been, or would have been, diminished.'

"In many cases the nature of the contract, or its circumstances may make it extremely difficult, if not impossible, to apply any such rule, but that rule of law seems applicable to all contracts where it can practically take effect. Under these circumstances, their Lordships will humbly advise His Majesty that this appeal ought to be dismissed with costs."

McIlwee & Sons' Offer.

The letter of Nov. 11, 1914 referred to in the above judgment was written by S. S. Taylor, K.C., counsel for McIlwee & Sons, to Foley Bros., solicitors as follows: "We have yours of today stating that yours of yesterday is not 'without prejudice' which, of course, also means that the letter of Foley Bros., Welch & Stewart, of Oct. 9, 1914, is also not 'without prejudice.' Our clients are, and always have been, willing and anxious to do anything within reason; their conduct in the face of Mr. Dennis' unreasonable behavior at the time of cancellation showed plainly that they were most anxious to proceed with the work. They complain most bitterly against the treatment accorded them by Mr. Dennis and even after the indefinite letter of Oct. 9, 1914, referred to above, they complain that Mr. Dennis strongly intimated to them that it would not be well for them to return to work; these peculiar things have upset their confidence, because on the one hand Foley Bros., Welch & Stewart invite them in an indefinite letter, but nevertheless in writing, to return to work, whilst on the other hand, verbally, the man who represents Foley Bros., Welch & Stewart intimates to the contrary. In view of the above, and in any event, if they are to have the opportunity to return to work there must now be a very definite understanding. My clients are unquestionably the largest tunnel contractors upon this continent, and have very large contracts elsewhere, hence are not in the position of people looking for a job, nor of those having got one to suffer to be knocked out one day and taken back the next.

"I may say that they are willing to attempt to arrive at a definite under-

standing with your clients, the basis of which will need to be somewhat as follows: 1. The present contract stands.

"2. Your clients' conduct has completely broken up the entire organization of McIlwee & Sons at Rogers Pass. Their foreman, sub-foreman and workmen are distributed all over Canada and the United States, and it will be impossible to get many of them together again. This condition existed even on Oct. 9, 1914. This means that considerable provision must be made in allowance of time to permit McIlwee & Sons to again get together an organization as efficient and capable of handling this work as the organization existing in Sept. 1914, so that the work can be carried on at the least possible cost to our client and at the greatest possible speed per month; our statement of claim herein shows that every month, by reason of their weeding out process and retaining the best men, they were able to accomplish faster and better work and at a greater profit and do more lineal feet per month, thus demonstrating all I have claimed for them. Inasmuch as this condition of affairs must again be worked up through the process of several months at great expense and disadvantage and loss, your clients must agree to pay that loss, which must be arrived at in a lump sum before we can again consider going back to work, and provision must be made for early payment of this loss. This damage, of course, will embrace all expense connected with Mr. McIlwee's own office staff and organization as well as that of his workmen.

"3. The number of feet required to be done per month before the lineal feet constituting the basis for bonus calculations shall be counted, must be less than heretofore, for such number of months after recommencing the work as will permit of the perfecting of organization, etc.; to the standard existing at the time of cancellation of the contract. The same, of course, applies to all other maximum requirements of the existing contract.

"4. Tunnel equipment conditions must be as favorable as they were during the first week of Sept., 1914, and the equipment for carrying out ventilation and the supply of power must be put in first class shape and be operated to the fullest extent reasonably required by McIlwee & Sons or any person representing them. In other words, as to ventilation, the workings must be kept clear at all times from gas and the workings supplied with pure air and no delays must occur on this account nor by reason of any lack of power. You can readily see that if our clients return to work these things could be neglected or done in such a way that it would be impossible for our clients to make any profit out of their work. There must be full, fair dealing in the future. Nothing unreasonable is asked. Our clients must be given the very best and most honest opportunity of carrying out the work at the highest pitch of speed that they are capable of. The new agreement will make ample provision for this, so that the existing agreement will be honestly and fairly carried out and not left to the quirk of any engineer.

"5. Your clients have, also, done a great deal of the rock work since the date of cancellation, which rock work was embraced in our clients' contract, and our clients have lost the profit that they otherwise would have made upon this work. This profit must be fixed and paid to them.

"6. Our clients will lose for some time

to come the rate of profit that they could have made had they not been interfered with and their organization disrupted. A definite agreement must be made to provide for this lost opportunity for profit and, as definite a sum as can possibly be fixed, must be fixed and paid.

"7. Our clients have been greatly damaged in the earning of the bonus in respect of which at the time of cancellation they show an average entitling them to \$215,000; provision must be made to protect this and the balance of the bonus, and to provide for the payment. My own opinion is that the basis for earning this bonus has been so wrecked by the action of your clients through their cancellation proceedings, that this amount should be now fixed definitely and paid. However, that can be a matter of negotiation, but I do think that it is unfair to entirely disrupt their organization upon which the earning of this bonus so directly depended and now to throw the average upon which it is based into jeopardy with an entirely new organization and under new conditions. I think it only fair that this should be disposed of finally. This item is a very heavy one and certainly

Stock Cars for Canadian Government Railways.

As stated in Canadian Railway and Marine World for February, 200 wood frame stock cars are being added to Canadian Government Railways rolling stock. The principal dimensions are:

Capacity	60,000 lbs.
Length over end sills	36 ft. 9 $\frac{1}{2}$ in.
Width over side sills	9 ft.
Height top of sill to underside of plate,	7 ft. 10 $\frac{3}{4}$ in.
Length inside	36 ft.
Width inside	8 ft.
Height top of floor to underside carlin	8 ft.
Door openings, side	5 ft.
Door opening, end	2 ft.
Distance between centre of trucks	26 ft. 9 $\frac{1}{2}$ in.

As shown by the accompanying illustration the design is of the standard construction for wood stock cars. Instead, however, of having the wood draft sills with the standard draft gear for wood cars, these cars are equipped with the Intercolonial standard metal draft arms, which are composed of steel plates and shapes rivetted together, and when applied to the cars, the capacity of the draft gear equals that of the steel frame



Stock Car for Canadian Government Railways.

must be adequately protected.

"8. Our clients must first inspect the tunnel and see the present conditions and view the work that has been done by your clients since cancellation, and also the present ventilation plant and the plant for the supply of power, the bunk houses and the boarding house accommodations, because it may be that your plant and working conditions there have so changed that our clients could not possibly hope to succeed to carry out the work profitably.

"9. Your clients must make provision for fair treatment to be accorded our clients by your engineers; in other words, you know it is difficult to anticipate everything that a person can do to hamper a contractor. All that we ask is absolute fair treatment.

"The above will give you an idea of the difficulties to be surmounted in this matter, and I am sending a copy of this letter to my clients tonight so that if you wish to further discuss the matter, we will very soon be in a position to carry on that discussion."

Canadian Northern Ry. Contractors' Suits.—Suits have been entered by the Johnston & Carey Co., railway contractors, St. Paul, Minn., against the Canadian Northern Ry. and Foley, Welch & Stewart, for \$250,000, \$19,000 and \$47,000, in respect of certain contracts for railway construction in the neighborhood of Fort Frances, Ont.

car. The cars, some of which have already been delivered, are being built by Canadian Car & Foundry Co., at Amherst, N.S.

The Pennsylvania Railroad's Elevator Buffalo, N.Y., is to be improved by an additional marine leg and extensions of the weighing and car loading apparatus so as to make it possible to unload grain from a vessel at the rate of 40,000 bush. an hour and pour it into cars out of stores at the rate of 45,000 bush. an hour.

G.T.R. employes have made a further contribution to the Canadian Patriotic Fund, of pay for one day in May, representing over \$20,000. The amount contributed at the commencement of this year, was \$135,000, and during this year, four days pay, one day each quarter, will be contributed.

Four German locomotives, originally intended for use on the Bagdad Railway, are being used on the Egyptian State Railways, having been captured, together with a German vessel, early in the war, and condemned by a prize court at Alexandria.

The Montreal Harbor Commission has it is reported decided not to proceed any further at present with the project to electrify its railway lines.

C.N.R. Toronto Employes Picnic.—The annual picnic of the Canadian Northern Ry. Toronto employes was held at Orillia, Ont., June 17.

Canadian Railway AND Marine World

ESTABLISHED 1898

Devoted to Steam and Electric Railway,
Marine, Express, Telegraph, and Railway and Canal
Contractors' Interests.

Official Organ of various Canadian Transportation
Associations.

Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C. E.
Managing Director and Editor-in-Chief.

AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editors
JOHN KEIR AND DONALD F. KEIR

Canadian Business Representative,
W. H. HEWITT, 70 Bond Street, Toronto

United States Business Representative,
A. FENTON WALKER, 143 Liberty St., New York

European Business Representative,
J. MEREDITH MCKIM, 16 Regent St., London, Eng.

Authorized by the Postmaster General for Canada,
for transmission as second class matter.

Entered as second class matter, July 25, 1913, at the
Postoffice at Buffalo, N. Y., under the Act of Congress
of March 3, 1879.

SUBSCRIPTION PRICE, including postage any-
where, \$2 a year.

SINGLE COPIES, 20 cents each, including postage.

The best and safest way to remit is by express money
order. Where one cannot be obtained, a post office
money order, or bank draft, payable at par in Toronto,
may be sent. Cheques or drafts not payable at par in
Toronto cannot be accepted. Remittances should be
made payable to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by
the 10th of the month preceding the date of publication.

TORONTO, CANADA, JULY, 1916.

PRINCIPAL CONTENTS

American Railway Master Mechanics Association	
Boiler Design and Maintenance	271
Canadian Officials at Convention	270
Fuel Economy and Smoke Prevention	268
Injector Flange and Screw Couplings	255
Mechanical Stokers	256
Modernizing Existing Locomotives	266
Officials Elected	272
Pistons, Valves, Etc., Material and Design	259
Superheater Locomotives	257
Use of Powdered Fuel in Locomotives	255
Appointments, Transportation	290
Birthdays of Transportation Men	278
Board of Railway Commissioners	
Orders by, Summaries of	292
Traffic Orders	282
Canadian Northern Ry. Construction, Etc.	278
Vancouver Station	273
Canadian Pacific Ry. Construction, Etc.	285
North Toronto Station	287
Rogers Pass Tunnel Litigation	275
Electric Railway Department	293 to 299
Car Operation on Bridge Approaches in Winnipeg.	293
Niagara Falls Park & River Ry. Safety Provisions.	296
Projects, Construction, Etc.	295
Toronto Ry. Rights on Yonge St.	294
Express Companies, Among the	306
Mainly About Railway People	283
Marine Department	300 to 305
Great Lakes Water Diversion	301
Sault Ste. Marie Canals Traffic	302
Steel Shipbuilding in Nova Scotia	300
Toronto Harbor Works	304
Vessels Registered	301
Master Car Builders Association	
Canadian Officials at Convention	270
Car Construction	255
Car Trucks	257
Car Wheels	263
Officials Elected	272
Safety Appliances	258
Settlement Prices for Reinforced Wooden Cars.	256
Welding of Cast Steel Truck Frames and Bolsters	258
Railway Accommodation at Camp Borden	273
Railway Development	281
Railway Earnings	274
Railway Finance, Meetings, Etc.	280
Railway Rolling Stock Notes	291
Railway Supply Exhibits at Atlantic City Conventions	265
St. John & Quebec Ry. Construction, Etc.	280

Extension of Time for Installing Safety Appliances.

The Board of Railway Commissioners passed general order 166 May 29, as follows: Re general order 102, Feb. 17, 1913, prescribing Rules and Regulations Respecting Safety Appliances on railway trains, and general order 128, July 20, 1914, granting an extension of time until July 1, 1916, within which the railway companies shall make certain changes, as set forth in the order, upon reading what is filed on behalf of the railway companies it is ordered that they be granted an extension of time until July 1, 1917, within which to make the changes required under general order 128.

In a circular transmitting the order to railway companies it is stated that the Board expects rapid progress to be made with the work and that monthly reports be forwarded to its Chief Operating Officer as to the equipment of the cars.

Another Railway Construction Battalion.

J. W. Stewart, of Vancouver, B.C., of the contracting firm of Foley, Welch & Stewart, and President of the Pacific Great Eastern Ry., has been authorized by the Minister of Militia to organize a battalion of railway men for overseas service, of which he will probably have the command. The construction corps will have the same establishment as an infantry battalion, that is approximately 1,150 men, including base company. It will be organized on similar lines to that of the Canadian Overseas Railway Construction Corps raised under C.N.R. auspices. A recruiting office has been opened in the 400 Block on Homer St., Vancouver. It was reported, June 7, that about 250 men had then enlisted. The battalion will, it is stated, be mobilized at Valcartier, Que.

Grain Inspection at Western Points.

The following figures compiled by the Department of Trade and Commerce, show the number of cars of grain inspected on railways at Winnipeg and other points on the Western Division for May, and for nine months ended May 31, with a comparison of the number of cars inspected for nine months ended May 31, 1915.

	May	Nine months to May 31, 1916	Nine months to May 31, 1915
C.P.R.	17,104	152,712	56,908
C.P.R. Calgary	465	6,069	6,078
C.N.R.	8,918	80,239	36,308
G.N.R. Duluth.	160	4,845	1,344
G.T.P.R.	2,485	35,474	14,180
Totals	29,131	279,339	114,818

The Canadian Northern Ry has provided a special demonstration train for the use of the Saskatchewan Agricultural College. It contains a refrigerator car, live stock car, flat car for live stock demonstrations, boys' and girls' car, field crop production car, lantern lecture car, and household science car, and is to be used by the college to give agricultural instruction to residents along the C.N.R. lines in the province.

Russia's new railway from Petrograd to the White Sea, is nearing completion. Construction of the railway was begun last February, and the work has been executed by 10,000 prisoners, all Slavs from the Austrian army. Five hundred skilled men from Canada have also been engaged upon the fourth section. The line is single track.

Delaware and Hudson Co's Report.

The Delaware and Hudson Co.'s report for the year 1915 covers the operations of the company's collieries and steam and electric railways in the United States and its two lines in Canada—the Napierville Junction Ry. and the Quebec, Montreal and Southern Ry. The statistical statements cover the operations of the whole undertaking, but an incidental reference to the Canadian lines is made in the comments upon the finances. Specific details of the operations of the two Canadian lines, covering the year ended June 30, 1915, were given in our June issue, pg. 218.

The company operates 909.07 miles of railway in the U. S. and 232 miles in Canada. The total operating revenue for 1915 was \$23,787,519, against \$22,722,961.55; the operating expenses being \$14,823,625.67, against \$15,188,850.92; leaving a net operating revenue of \$8,963,893.33, against \$7,534,110.63. The Interstate Commerce Commission's new classification reserve, effective July 1, 1914, consequently the figures for 1914 have been readjusted in order to place them upon a comparable basis with those of 1915. Adding other sources of income, the railway department had a net income for the year of \$9,356,838.21, from which was deduced rentals, fixed charges, etc., amounting to \$4,840,953.24, bringing a net income of \$4,515,884.97, against \$3,171,457.82 for 1914. Adding thereto net income from coal mining department and from all other sources, the net income for the year was \$6,071,440.64, against \$4,609,793.85; representing 74.28 per cent., against 10.84 per cent. on the capital stock of \$42,503,000. Dividends at the rate of 9 per cent. were declared during the year, absorbing \$3,825,270. The general balance sheet shows total liabilities of \$133,803,442.88, and total assets of \$154,514,595.13, the surplus of assets being \$20,711,152.25, against \$18,773,318.34 in 1914.

The report contains the following paragraphs relating to the Canadian lines: "The Quebec, Montreal & Southern Ry. shows a decrease in operating revenues of \$47,963.04, compared with the previous year. Operating expenses decreased \$12,876.21. Income from hire of equipment decreased \$10,189.80. Net income, not allowing for interest due Delaware and Hudson Co., was \$96,188.56, a decrease of 35.47 per cent. The Napierville Junction Ry. shows an increase in operating revenues of \$9,949.74, compared with the previous year. Freight revenue increased \$11,538.07, while passenger revenue decreased \$2,129.95. Operating expenses decreased \$3,632.31. Net income was \$41,923.02, or 6.99 per cent. on capital stock outstanding, an increase of \$17,064.91, compared with the previous year. A dividend of 5 per cent. for the year 1915 was declared."

The table of securities owned by the company includes \$1,000,000 of the Quebec, Montreal and Southern Ry. stock and \$600,000 of Napierville Junction Ry. stock.

The Canadian Construction Co. has been incorporated under the Quebec Companies Act with authorized capital of \$90,000 and office at Montreal, to carry on a general contracting and construction business, and in connection therewith to own and operate quarries, railway sidings, rolling stock, etc. The provisional directors are: J. A. Beaudry, J. E. Valin, E. T. Sayers, U. Beaudry, and G. E. Couillard, Montreal.

Canadian Northern Railway Construction, Betterments, Etc.

Mount Royal Tunnel & Terminal Co.—In order to overcome a difficulty which has been raised in connection with the leasing of the Mount Royal Tunnel & Terminal Co.'s property to the Canadian Northern Ry., the Canadian Northern Ontario Ry. and the Canadian Northern Quebec Ry., an act has been passed by the Dominion Parliament declaring that the provisions of the statutes of 1914, chap. 28, sec. 1, sub. sec. 2, were intended to make and did make the whole of the rents or sums reserved or made payable under the agreement or lease therein referred to a charge upon the whole of the property, assets, rents and revenues of the lessees, parties to the said agreement or lease, the said charge ranking next after penalties heretofore or hereafter imposed for noncompliance with the requirements of the Railway Act, and in priority to all mortgages, changes or encumbrances made or created by such lessees before or after the passing of the said chap. 78, and in priority to all securities thereby secured."

Canadian Northern Ry.—Tenders are under consideration for the extension of the company's freight car shops at the west yard, Winnipeg.

M. H. MacLeod, General Manager and Chief Engineer, promised recently to have an investigation made into the proposal to build a 12 mile extension from Beulah, the present terminus of the Rapid City section, to Birtle, Man.

A contract is reported let to Shannon Bros. for remodelling of the ground floor of the station at Saskatoon, Sask., and the building of a brick extension thereto. The main part of the contract is said to involve the bricking in of the pillars at present supporting the extension of the roof over the platform at the north end of the general offices, thereby converting what is now platform space into a commodious office for the dining and sleeping car department. A wide passage will be left between the north wall of the present general office and the first pillar so that passengers will not require to go out of their way to gain access to the trains. A second platform is also to be built between the first and second tracks. It is expected that the work will be completed early in August.

The Board of Railway Commissioners has ordered the company to complete the fencing of its line east and west of Onoway, Alta.

Canadian Northern Pacific Ry.—M. H. MacLeod, General Manager and Chief Engineer C.N.R., and T. H. White, Chief Engineer C.N.P.R., have completed a trip of inspection over the route of the proposed branch line from Kamloops to Kelowna, B.C. Mr. MacLeod is reported to have told the Kelowna Board of Trade that construction would be started on the line at an early date, probably before the end of July. The branch including branch, sidings and spurs will require 140 miles of track, and will run through Armstrong and Vernon, from which point there will be a branch to Lumley. The line was located in 1913; and about 80% of the right of way is reported to have been acquired, with station sites at Armstrong, Vernon, Kelowna and Lumley.

We are officially advised that the intimation given by Mr. MacLeod, in respect to construction on this branch, was that

work would be started on some of the heavy work in the neighborhood of Kamloops in about six or eight weeks from the date of the inspection.

Vancouver Terminals.—The plans for the erection of the station building at False Creek flats, Vancouver, were received in that city June 1, and tenders for its erection were received up to June 20. A description of the building appears on another page of this issue. It is reported that the work to be done in addition to the building of the station, and for which other contracts will be let, will involve the handling of 4,000,000 cubic yards of filling, the laying of 130,000 ft. of tracks; the building of a freight shed 800 x 40 ft. and a locomotive house.

Vancouver Island Lines.—Track is reported to have been laid from Patricia Bay to near Victoria, B.C., and ballasting is being gone on with. A contract is reported let to Robertson & Co., Vancouver, for the erection of a concrete bridge over the Burnside Road, Victoria. Work has been started and is to be rushed to a completion as fast as possible. It is expected that construction will be started upon the car ferry slip at Patricia Bay at an early date. It will be 303 x 27 ft. (May, pg. 178.)

Birthdays of Transportation Men in July.

Many happy returns of the day to:

A. A. Allen, Vice President, The Holden Co., Ltd., Montreal, formerly Master Mechanic, Timiskaming and Northern Ontario Ry., born at Grafton, Ont., July 7, 1870.

J. H. Black, ex-Superintendent, Timiskaming and Northern Ontario Ry., now at Toronto, born near Smiths Falls, Ont., July 8, 1874.

M. S. Blaiklock, Engineer Maintenance of Way, G.T.R., Montreal, born at Quebec, July 19, 1859.

D. E. Blair, Superintendent of Rolling Stock, Montreal Tramways Co., born at St. Thomas de Montmagny, Que., July 25, 1877.

H. F. Bradley, Passenger Department, H. & A. Allan, Ltd., Montreal, born at Waterville, Que., July 20, 1876.

D'Alton C. Coleman, Assistant General Manager, Western Lines, C.P.R., Winnipeg, born at Carleton Place, Ont., July 9, 1879.

George Collins, Superintendent, Ottawa Division, Ontario Grand Division, Canadian Northern Ry., Trenton, born at Kingston, Ont., July 20, 1860.

G. C. Conn, Vice President, Pere Marquette Rd., Detroit, Mich., born at Woburn, Mass., July 1, 1867.

D. D'E. Cooper, Canadian Freight Agent, Lehigh Valley Rd., Toronto, born at Buffalo, N.Y., July 8, 1862.

John Corbett, ex-General Foreign Freight Agent, C.P.R., Montreal, born in Lanarkshire, Scotland, July 19, 1863.

H. Darling, Locomotive Foreman, G.T. Pacific Ry., Smithers, B.C., born in Northumberland, Eng., July 27, 1873.

S. E. Dewey, General Eastern Freight Agent, G.T.R., New York, born at Beckenham, Kent, Eng., July 4, 1879.

A. H. Eager, Assistant Superintendent of Rolling Stock, Western Lines, Canadian Northern Ry., Winnipeg, born at Waterloo, Que., July 15, 1868.

F. C. Foy, Canadian Passenger Agent, New York Central Lines, Toronto, born there, July 5, 1881.

J. F. Gildea, District Master Mechanic, C.P.R., Montreal, born at Strood Park, near Horsham, Sussex, Eng., July 7, 1884.

A. D. Huff, ex-Division Freight Agent, G.T.R., Ottawa, now Traffic Manager, Laurentide Co., Montreal, born at Chatham, Ont., July 17, 1866.

C. W. Johnston, Assistant General Passenger Agent, G.T.R., Montreal, born at Actonvale, Que., July 27, 1879.

M. Kelly, Resident Engineer, District 4, Ontario Division, C.P.R., Toronto, born at Thamesville, Ont. July 6, 1874.

A. E. Lock, Superintendent Car Service, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., born at Albany, N.Y., July 14, 1879.

G. A. McNicholl, Assistant General Freight and Passenger Agent, Grand Trunk Pacific Ry., Prince Rupert, B.C., born at Montreal, July 31, 1876.

H. D. Mackenzie, District Master Mechanic, Intercolonial Ry., Stellarton, N.S., born at Churchville, N.S., July 22, 1864.

T. J. Maguire, Accountant, Quebec Central Ry., Sherbrooke, Que., born at Quebec, July 31, 1860.

W. G. Manders, General Freight Agent, Western Lines, Canadian Northern Ry., Winnipeg, born at Owen Sound, Ont., July 24, 1876.

J. E. Morazain, Superintendent, District 1, National Transcontinental Ry., Quebec, Que., born at Wheatland, Que., July 31, 1875.

R. E. Perry, Assistant General Freight Agent, Canadian Government Railways, Moncton, N.B., born at Drayton, Ont., July 5, 1876.

R. Preston, Assistant Superintendent of Motive Power, Western Lines, C.P.R., Winnipeg, born at Toronto, July 28, 1863.

J. E. Quick, General Baggage Agent, G.T.R., Toronto, born at Richmond, Ontario Co., N.Y., July 10, 1851.

G. G. Ruel, Chief Solicitor, Canadian Northern Ry., Toronto, born at St. John, N.B., July 5, 1866.

George Stephen, Assistant Freight Traffic Manager, Western Lines, Canadian Northern Ry., Winnipeg, born at Montreal, July 5, 1876.

Sir Thos. Tait, President, Fredericton and Grand Lake Ry. and Coal Co., Montreal, born at Melbourne, Que., July 24, 1864.

G. A. Walton, General Passenger Agent, Western Lines, C.P.R., Winnipeg, born at Montreal, July 17, 1881.

Increased Working Hours in Intercolonial Ry Shops.—Commencing June 1 the working hours in the I.R.C. shops at Moncton, N.B., were fixed as from 7 a.m. to 6 p.m., with one hour for dinner, daily, except Sunday. That is one hour of overtime each day for five days, and two hours on Saturday. It is stated that the extra hours are necessary owing to the general conditions. During the winter traffic was very heavy, and with the difficulty of securing and holding mechanics it has not been possible to keep the rolling stock up to requirements.

The Engineers' Club of Montreal shows a net profit for the financial year ended Mar. 31, of \$12,805, which has been applied to writing off portions of the general equipment accounts. The balance sheet shows assets of \$281,000 with liabilities of \$91,000. There are 515 members, of whom, 19 are on active service overseas. Four members were killed in action during the year. The President of the club is H. Holgate, and R. W. H. Smith is Secretary.

No. 1 Construction Battalion for Overseas Service.

Considerable information about the No. 1 Construction Battalion which is being raised by Lt. Col. Blair Ripley, M.Can. Soc.C.E., heretofore Engineer of Grade Separation, C.P.R., Toronto, was given in Canadian Railway and Marine World for June. In addition to the appointments then mentioned four supernumary lieutenants have been taken on as follows:

F. A. R. McNair, of the City Works Department, Toronto. He has been connected with the roadways branch for some years and has had charge of considerable roadway and paving work.

C. M. Saul, of Montreal, a civil engineer who served his time in Scotland. During the past three years he has been with the California Highway Commission, his special line of work being paving and roadway construction.

The Late James Jerome Hill.

The death of J. J. Hill, at one time President, and later Chairman, Great Northern Ry., took place at St. Paul, Minn., May 29, too late for an announcement to be made in our June issue. He had been in indifferent health for some little time, but his death was not anticipated until within the last few days of the month.

He was born at Rockwood, near Guelph, Ont., Sept. 16, 1838, and attended school there until he was 14 years old, when his father died, and he worked at the village store. In 1856 he obtained work at St. Paul, Minn., as a shipping clerk, and in 1865 was appointed agent for the Northwestern Packet Co., at St. Paul, and two years later, local agent for the St. Paul & Pacific Ry., running a short line between St. Paul wharf and St. Anthony's Falls. During this period he began a friendship

considerable knowledge of the mineral resources of those regions. In the meantime some extensions had been made to the St. Paul & Pacific Ry., as far as the Red River, but owing to bad management, it deteriorated until in 1873 it became bankrupt. Again in conjunction with N. Kitson, he organized a syndicate to acquire the property, and through Donald A. Smith, then chief representative of the Hudson's Bay Co. at Winnipeg, later Lord Strathcona, enlisted the support of George Stephen, then President, Bank of Montreal, later Lord Mount Stephen, and purchased the property for about 40% of the par value of the outstanding securities. The company was reorganized in 1879 as the St. Paul, Minneapolis & Manitoba Ry. with George Stephen as President, and J. J. Hill as General Manager. In the late seventies the line was extended to the International Boundary at St. Vincent, Minn., where it connected with the line built from the other side of the boundary at Emerson Minn., to St. Boniface, opposite Winnipeg, by the Dominion Government and which was known as the Canadian Pacific Railway, Pembina Branch. In 1881 he became one of the members of the syndicate formed to take over from the Dominion Government the portions of the C.P.R. which were completed and under construction, and he was one of the first directors of the C.P.R. Co. Wm. C. Van Horne, afterwards Sir Wm. C. Van Horne, being selected as the first General Manager on his recommendation at the end of 1881. He only remained on the C.P.R. board for a comparatively short time, devoting his energies to the St. P.M. & M.R., and in 1882 he was elected its Vice President, and in 1883, President, when he relinquished his holdings in the C.P.R., and confined himself exclusively to the upbuilding of the system of railways now known as the Great Northern, and also becoming largely interested in the Northern Pacific, and the Chicago, Burlington & Quincy. This, it is claimed, was accomplished without any Government aid in cash, and with only 3,675,000 acres of land as a grant. He retired as President, G.N.R. in 1907, and was for a short while Chairman of the Board.



Recruiting Car No. 1 Construction Battalion, Canadian Expeditionary Forces.

The car shown above is being used in Toronto for recruiting for No. 1 Construction Battalion, which is being raised by Lt.-Col. Blair Ripley, M.Can.Soc.C.E., until recently Engineer of Grade Separation, C.P.R. Toronto, and full particulars of which were given in Canadian Railway and Marine World for June. The car has been loaned by the Toronto Ry., and was decorated by men of the battalion. Lieut. G. Fleming, son of R. J. Fleming, General Manager, Toronto Ry., is in charge of recruiting for the battalion.

Leslie B. Allen, civil engineer of the City Works Department, Toronto, who has had a number of years experience in paving and roadway work.

R. W. H. Palmer, of St. Catharines, Ont., a civil and mining engineer and a retired captain of the Imperial Army.

No appointment of major has been made and this office will probably remain unfilled until the battalion reaches England.

While the enlistment has not proceeded as rapidly as was expected, it is said that the battalion is filling up faster than any of the infantry battalions, the strength being already over 500, with indications that the balance necessary to complete the full force, 1038 officers and men, will be secured quicker than the first half.

It is not intended to give the men much drill, in fact not more than is necessary for the purpose of obtaining discipline and fitting them for moving about from place to place with expedition.

and later entered into partnership with Norman Kitson, who ran an ox wagon and sledge service to Winnipeg, and obtained practical knowledge of the conditions of the northwest on trips to and from Winnipeg. He also built up a business at St. Paul, supplying fuel to steamboats, and this developed into the firm of Hill, Griggs & Co., and later, the Northwest Fuel Co., and in connection with this business, he brought the first boat load of eastern coal to St. Paul from Peoria, Ill., by way of the Illinois & Mississippi Rivers. In 1870, in partnership with N. Kitson, he organized the Red River Transportation Co., and built two vessels, which, in connection with the stage route, established the first through service between St. Paul and Winnipeg. While he was acting as railway agent, it was part of his duty to pilot the scientists Louis and Alexander Agassiz through the Red River and Lake Superior districts, and while with them he gained

Pullman Co.'s Profit Sharing Plan.

The directors have set aside 5,000 shares of stock, which will be sold to employees at \$155, which is about \$10 below current market price. The employees will make deferred payments, and only those who have been in the company's service over one year will be allowed to purchase. An employee will be allowed to purchase one share for each \$500 of his annual pay, or portion thereof, up to 25 shares for those having a salary of \$12,000. Payments will be at the rate of \$4 a month per share. Interest will also be paid on the deferred payments, at not more than 4%, and the purchaser will receive dividends from the date of his purchase.

Too Forceful Ejection From Train.

The Supreme Court of Canada in giving judgment in the appeal case of Diplock against the Canadian Northern Ry. has decided that the company's servants must not use undue force in ejecting trespassers from its premises or trains. The plaintiff was beating his way from Saskatoon to Regina in company with another man. In the altercation the company's brakeman kicked the second man, knocking him against Diplock, who fell off the train, with the result that he lost a portion of his foot. The jury awarded him \$1,000 damages, which award has been affirmed.

St. John and Quebec Railway Construction and Operation.

The Dominion Parliament has passed an Act providing aid for the building of the St. John & Quebec Ry., and to confirm an agreement between the company, and the Governments of Canada and of New Brunswick. The Act, in the first place, repeals the statutes of 1912, chap. 49, and the statutes of 1914, chap. 52, these being the Acts confirming agreements for subsidizing the building of the line up to \$6,400 a mile, the building of three bridges across the St. John and Kennebecasis Rivers by the Dominion Government, and for the operation of the line as a branch of the Intercolonial Ry., on the division of the gross receipts in the proportion of 60% for the I.C.R., and 40% for the New Brunswick Government. The Act further authorizes the Minister of Railways to enter into an agreement (set out in a schedule); provides that the Government Railways Act, and the Acts heretofore or hereafter passed amending the same, shall extend to the lines operated under the agreement, and that any expenditure made under the Act and of the agreement shall be paid out of the Consolidated Revenue Fund. The second part of the Act provides for the granting of a subsidy up to \$6,400 a mile, for a railway from Andover to Centreville, 26 miles; from Centreville to Gagetown, 120 miles, and from Gagetown to Westfield on the C.P.R., 45 miles, in lieu of the subsidies granted in 1913, and that any sums paid under the Railway Subsidies Act of 1913, shall be considered as having been paid under this Act. It is also provided that any portion of the company's line constructed on lands acquired by purchase or lease from the C.P.R. in or near Fredericton, may be included for the purpose of the subsidy as part of the total length of the company's line.

The schedule to the Act contains the agreement made between the Department, the New Brunswick Government and the company. This agreement cancels the former agreement made Mar. 5, 1912, respecting the leasing of a line from a junction with the National Transcontinental Ry. at Grand Falls to St. John, at a rental of 40% of the gross receipts, and substitutes therefor a new agreement providing for the leasing of the line in sections as built, upon terms to be agreed upon, and for the leasing of the whole line when completed within the time limits mentioned—Aug. 1, 1917, as for the line from Gagetown to the C.P.R. at Westfield, and Dec. 1, 1919, as for the section from Centreville to Andover—at a rental of 40% of the gross proceeds, payable to the New Brunswick Government. This rental is to be used by the New Brunswick Government to pay interest and sinking fund on the bonds issued for the construction of the line, to which the guarantee of the Province has been affixed. The total bond issue is not to exceed \$35,000 a mile; and any sum remaining after the bond issue has been provided for is to be paid over to the company. The agreement for the operation of the completed line from Centreville to Gagetown, is to date from April 1, 1915. The Dominion Government is to provide the necessary rolling stock for the operation of the line. The company is authorized to build certain portions of its railway in Fredericton upon Dominion lands, upon terms to be fixed by the Dominion Government. The company undertakes to purchase or lease from the C.P.R. suffi-

cient right of way from near the Victoria Station in Fredericton to the Intercolonial Ry. Y connection with the C.P.R., 133 miles; and to acquire by lease running rights over the C.P.R. and the St. John Bridge & Ry. Extension Co.'s from Westfield into St. John, upon terms and conditions to be approved by the Dominion and New Brunswick Governments. The expenditures by the Dominion Government for additional track, sidings, yards, buildings, alignments and grade revisions and other facilities required for the economic and efficient handling of traffic on the line, shall be repaid by the Dominion out of any part of the gross earnings received by the company, or by debentures secured by mortgage on the railway at 4%, but no such expenditure shall be made without the consent of the company, or an order of the Board of Railway Commissioners. Differences are to be submitted to arbitration, the Dominion Government being one party, and the Province of New Brunswick and the company the second party. In the event of anything arising which is not provided for, the matter shall, on the application of either party, be submitted for decision to the Board of Railway Commissioners.

Appended to the agreement are the specifications for the construction of the line.

The New Brunswick Legislature, on April 29, passed an Act respecting aid to the St. John Valley Ry., the provincial title of the company by which the railway known to the Dominion Parliament as the St. & Quebec Ry. is being built. The measure ratifies the agreement referred to above with the Dominion Government. The Premier informed the Legislature that the cost of the completed section of the line from Centreville to Gagetown, 120.3 miles, had been \$37,153 a mile. The Act authorizes the construction of the line from Gagetown to the C.P.R. at Westfield, and from Centreville to Andover, the Province to guarantee the bonds of the company, which is now controlled by the Province, for \$35,000 a mile. The question of the building of a line from Andover to Grand Falls to a connection with the National Transcontinental Ry., was held over for further consideration, as also was the proposition to make a connection with the Maine Central Rd.

A contract for building the 40 mile extension from Georgetown to Westfield on the C.P.R., has been let to the Nova Scotia Construction Co., in which T. Cozzolino is interested, and of which H. Lindsay is Managing Director. F. W. Sumner, Chairman of the Board of Directors of the Ry., is reported to have said that the contract figure is considerably lower than the price originally submitted. There was one other tender submitted. The work is to be sufficiently advanced by Feb. 1, 1917, to allow trains to pass over the section with safety, and the contract is to be completed by Aug. 1, 1917.

The Premier of New Brunswick, referring to the letting of the contract, June 8, is reported to have said that the delay in reaching a definite decision as regards the route was due to the fact that a final decision had not been reached on some sections on which there were conflicting surveys. There were portions of the route as to which there was no doubt and work on these would be gone on with at once.

Subcontracts are reported as follows: From Gagetown south, 10 miles, Smith &

Merrithew; next ten miles, Lynch and Gorman; next ten miles, Poupore Bros.; next 10 miles to Westfield, Kennedy & McDonald. (May, pg. 183.)

Railway Finance Meetings, Etc.

Canada Southern Ry.—At the annual meeting at St. Thomas, Ont., June 7, the following were elected directors for the current year, and also for the Niagara River Bridge Co., and the Niagara Grand Island Bridge Co.: J. E. Brown, C. M. Depew, H. B. Ledyard, W. H. Newman, F. W. Vanderbilt, W. K. Vanderbilt, W. K. Vanderbilt, Jr., and E. A. Wicks.

Central Vermont Ry.—The Massachusetts Legislature has authorized the C.V.R., a G.T.R. subsidiary, to acquire any or all of the Southern New England Ry.'s stock.

Guelph Jct. Ry.—The amount paid over to the city of Guelph, Ont., May 30, as the result of the operations of the Guelph Jct. Ry. for the previous quarter, was \$9,775, an increase of about \$1,600 over the same quarter in 1915. The amount received represents about 5% on the stock the city holds.

Temiscouata Ry.—Net earnings for March, \$199. Aggregate from July 1, 1915, to Mar. 31, \$24,346.

Toronto Belt Line Ry.—The annual meeting was held at Toronto, June 13. Following are the board for the current year:—E. J. Chamberlin, President; H. G. Kelley, Vice President; Frank Scott, Secretary-Treasurer; and J. E. Dalrymple.

Toronto, Hamilton & Buffalo Ry.—The Dominion Parliament has confirmed an agreement made between the company, the Michigan Central Rd., the Canada Southern Ry., the New York Central Rd., the C.P.R. and the Trust Co., dated Feb. 1, making certain traffic arrangements for 50 years, and providing for the guarantee of consolidated mortgage bonds to be issued by the company.

The Vancouver Transportation Club's members have inaugurated what they call the Social and Educational Ry, under which title its meetings are being conducted. The first of the series was held at the club rooms, 553 Granville St., May 26. The honorary officers of the club are: President, R. Marpole; first vice president, D. E. Brown; second vice president, R. W. Brodie; third vice president, W. A. Powers. The other officers are: President, J. A. McFaulds; vice president, J. K. Burns; second vice president, C. E. Lang; secretary treasurer, H. W. Schofield; directors, J. W. Nutt, A. Whitnall, A. Brostedt, A. L. Clements, J. A. Archer, C. E. Jenney, and C. E. Whitelock. The membership has reached 150, of whom about 100 were present at the inaugural meeting.

Fort William Terminal Development Co.—Superior Terminal Co.—A company with this title has been incorporated under the Ontario Companies Act, with authorized capital of \$250,000, and offices at Fort William, to deal in lands, buildings, etc. The provisional directors are A. J. McComber, G. A. McTeigue, and Miss E. E. Allen. These directors, with the addition of Miss L. McComber, are named as directors of the Superior Terminal Co., which was incorporated under the Ontario Companies Act, on the same day, with authorized capital of \$250,000 and offices at Fort William, Ont., to carry on grain elevator business in connection with a grain growing, buying and milling enterprise.

Railway Development, Projected Lines, Surveys, Construction Betterments, Etc.

Alberta & Great Waterways Ry.—We are officially advised that track has been laid to mileage 203 on the railway, which starts from a junction with the Edmonton, Dunvegan & British Columbia Ry., at Carbondale, Alta., mileage 14.4 out of Edmonton. (Mar., pg. 106.)

Blomidon Ry.—The Nova Scotia Legislature has extended the time for the construction of this projected railway, which is to be operated by steam, electricity or any other motive power, from Canning, on the Dominion Atlantic Ry. Cornwallis branch, to Cape Blomidon, with branches to Cape Split, and from Canning to Wolfville. (Oct. 1911, pg. 935.)

Dominion Government Ry. to Hudson Bay.—The Dominion Parliament at its recent session appropriated \$3,000,000 to carry on construction work on the railway, and on the terminals at Port Nelson, Man.

Construction is reported to have been restarted all along the line for the season, and it is fully expected that track will be laid by the end of the season to the Kettle Rapids, mileage 332 from Pas, Man.

Tenders are under consideration for the supply of hardware supplies for the Port Nelson terminals, and for the supply of hardware supplies for the Port Nelson terminals, and for the supply of provisions for the construction staff there. (June, pg. 219.)

Grand Trunk Ry.—Acting Superintendent McMillan attended a special meeting of the Lindsay, Ont., Town Council, June 8, to confer with that body as to the creation of a new locomotive house and machine shop there. The plans for this work were prepared some considerable time ago, but the outbreak of the war in 1914, caused a delay in taking action. Mr. McMillan is reported to have said that it was expected the work would be started at a very early date. It was proposed to put up a 20 stall locomotive house, built in circular style, so that it could be extended when circumstances warranted it. The biggest type of locomotives in use would be seen on the division before long. Besides the locomotive house a mechanical coal chute would also be constructed as well as a machine shop 50 x 100 ft. It was the intention of the company to erect the locomotive house between Angeline and Adelaide Sts., and between the railway and line fence in order that it might face Adelaide, but owing to the fact that there was only 220 ft. of land, it was decided to put its back to the north. The company as a result of these plans would have to carry four tracks across Adelaide St. at this point, and the consent of the council would have to be obtained before the tracks could be laid. The company would also have to build an extra water tank, which meant that they would get more water from the town. Consideration is being given to the matter by the council.

We have been advised by an officer of the G.T.R. that, so far as he is aware, there is no intention on the company's part to erect a new roundhouse or other buildings at Lindsay, Ont.

Plans are being prepared for the erection of two coal chutes at London, Ont., which hit is said will cost approximately \$40,000.

Edmonton, Dunvegan & British Columbia Ry.—Preparations for construction for the season are reported to be well forward. The new construction will cover a 54 mile extension from the present

terminus at Spirit River, to the B. C. Block, passing through the Pouce Coupe Prairie district. A sub-contract was reported let to W. T. Craig, Winnipeg, for the first six miles, June 2; and other sub-contracts were being arranged with G. Webster, J. Timothy, F. V. Riley and A. McGregor.

The finishing up of the line to Spirit River, including station and other buildings, etc., will be completed, and the ballasting and finishing up of the branch from Spirit River to Grande Prairie, will also be done this season.

It is reported that funds for the carrying on of the season's operations were secured by the deposit of \$2,420,000 of 4½% bonds, guaranteed by the Province of Alberta, with Chicago and Cincinnati bankers, on terms netting the lenders 5½%. (May, pg. 183.)

Great Northern Ry.—The company's officers have informed the Vancouver City Council that the contract for the building of the station at False Creek flats, let to Grant Smith and McDonnell Co., is on a percentage basis; that all employees are citizens of Vancouver; that they are being paid the current rates of wages, and that as far as possible all materials will be purchased in British Columbia. (June, pg. 222.)

Grand Trunk Pacific Ry.—A press report states that a grading outfit left Moose Jaw, May 27, for Gilroy, the end of track on the Regina-Moose Jaw-Gilroy line, to start grading for the extension of the line to the Saskatchewan River at Riverhurst, Sask.

The G.T.P.R. has deposited with the Minister of Public Works at Ottawa, description of the site and plans of a warehouse at Prince Rupert, B.C., in front of water block G., approval of which is required under the Navigable Waters Protection Act. (May, pg. 182.)

High River, Saskatchewan & Hudson Bay Ry.—The Dominion Parliament has extended the time for building this projected railway from any point in Tps. 25 to 28, range 1, west 4 meridian Alberta, to Saskatoon, Sask., to the Saskatchewan-Manitoba boundary between Tps. 52 and 56, and on to Pas, Man. (Mar., pg. 106.)

Intercolonial Ry.—In connection with the subway improvements completed recently on Main St., Moncton, N.B., the station platforms are being extended easterly to the subway. Tenders are under consideration for the erection of a viaduct, station building and train shed at Levis, Que., to replace the station destroyed by fire about a year ago. The plans for the building have been prepared by Ross & McDonald, Montreal. It is expected that building will be started early in July, and rushed as fast as possible. (July, pg. 231.)

Manitoba & Ontario Ry.—The application to the Dominion Parliament for the incorporation of a company with this title was withdrawn before the bill reached a third reading. (Feb., pg. 51.)

Margaree Coal & Ry. Co.—The Nova Scotia Legislature has extended the time for the construction of the company's projected railway from the Intercolonial Ry. near Orangeville to St. Rose, N.S., 46 miles, and from the Intercolonial, near McIntyre Lake, to Caribou Cove, Port Malcolm, N.S., four miles. (July, 1913, pg. 331.)

Michigan Central Rd.—A press report states that the company is planning to

erect a steel bridge across Bear Creek, near Enniskillen, Ont., at an estimated cost of \$60,000. There is no station named Enniskillen on the M.C.R. in Ontario, and the only place of the name in the province we know of is a post office near Burketon Jct., on the C.P.R. (June, pg. 223.)

Michigan Central Rd.—L. J. McKee, Superintendent, St. Thomas, Ont., an another official visited Sarnia, Ont., June 15, and was interviewed by a deputation to urge the transfer of the present terminals at Courtright to Sarnia. The officials went over the whole waterfront, made considerable enquiries, and informed the deputation that the matter would be carefully considered. (June, pg. 222.)

Montreal Central Terminal Co.—C. N. Armstrong, President, addressed the Builders' Exchange members in Montreal, June 2, on the company's terminal project. He said it would cost in the neighborhood of \$40,000,000, which would be furnished by U. S. financiers. The proposed station site would be from Bleury St. to St. Lawrence Boulevard, and Vitre St. to Lagauchetiere St., the building of which would necessitate the entire re-erection of Vitre and Lagauchetiere streets from Victoria Square to St. Denis St. The proposed station would have 10 lines of railways running into it. There are nine railways coming into Montreal now, but another company is planning to extend its tracks to this city. The station would be larger than the Pennsylvania Rd. station in New York and would be large enough to handle three times as many trains a day as go in and out of the C.P.R. Windsor St. station. On the west side of the building it would be necessary to expropriate the whole of St. Antoine St. Connection would be made with the Harbor Commissioners' tracks, both at the east and west, and a short line would also be built to give a connection at Fulham St. The present stations at Windsor St., Place Viger and Bonaventure would be maintained for freight purposes, and the train level in the station would be the same as the present level of the G.T.R. The main entrance to the station would be on Lagauchetiere and Vitre Sts., but approaches would also be provided from Bleury and St. Lawrence streets. The traffic into and out of the station would be operated by electricity. The tunnel under the St. Lawrence river would run from the Laurier pier in Hochelaga, to the G.T.R. wharf at Longueuil. From there a belt line would run around to the C.P.R. Lachine bridge by which it is proposed to enter the city on the western side to save the present construction of another bridge. The company's plans had been submitted to the Board of Railway Commissioners, and the Montreal Board of Control was preparing a report on them for submission to the council.

It was stated to the meeting that both the C.P.R., and the G.T.R. are opposed to the project. Controller Villeneuve is reported to have said, June 9, that while no railway could enter the city and use its streets would out the consent of the Board of Control and the City Council, the Board of Railway Commissioners was the principal body which should pass upon the proposal. (June, pg. 223.)

National Transcontinental Ry. Tenders will be received by the Railways Department, Ottawa, up to July 4, for

the construction of reinforced concrete foundations, on wood piles or concrete piles, for a 1,000,00 bush. storage capacity grain elevator, working house and track shed at Transcona, Man.

Pacific Great Eastern Ry.—The British Columbia Legislature has authorized the raising upon treasury bills or notes, or by the issue of British Columbia stock, of \$10,000,000, bearing interest at 4½%, and to be redeemable not later than June 30, 1941, out of which the Government is authorized to advance to the P.G.E.R. \$6,000,000. In consideration of this loan the company is to transfer to the Government, free of any liability whatever, \$2,000,000 of its share capital; it shall pay the cost of placing the loan; shall pay 4½% interest half yearly, and provide for the repayment of the principal before June 30, 1926. The money advanced is to be expended upon the construction of the company's railway, under the Government engineers' supervision. Security for the repayment of the loan is to be given by a mortgage upon the company's entire undertaking and lines, the mortgage to rank next after the securities issued under chaps. 34 and 36 of the statutes of 1912, and chap. 65 of the statutes of 1914, and to assign to the Government \$10,250,000 of the company's share capital, in addition to the \$2,000,000 provided for to be absolutely transferred. Any bonus granted by the Dominion, the City of Vancouver, or the town of Prince George, is to be paid over to the Government. The P.G.E. Development Co. is to be joined as a party to the transaction by the deposit of 49% of its share capital, and that the Government is to control the price and conditions of sale of the company's lands, and after the cost of subdivision and sale have been paid, one half of the proceeds is to be paid to the Government, on account of the repayment of the loan.

The Premier, in bringing the matter before the Legislature, stated it was clear that it was the Government's duty to assist with its credit in the completion of the railway. Failure to finish the line this year would mean a loss of \$2,000,000, being \$1,000,000 in road bed depreciation, and another \$1,000,000 for interest. If the province did not come to Foley, Welch & Stewart's aid that firm could not raise the money for the early completion of the line. The road would be valuable in bringing out wheat from the Peace River country, and some of the territory lying east in Alberta. The P.G.E. should also be finished as early as possible to give access to the Prince George district. Foley, Welch & Stewart could finish the line more expeditiously and more cheaply than any other firm, and it would be unwise to endeavor to cancel the contract they held, in favor of any one else.

D'Arcy Tate, Vice President, is reported to have said in an interview, June 5, that construction on the line had been resumed. Track laying had been restarted at the present end of track at Clinton, with the steel on hand. It had been found that comparatively little damage had been done during the exceptionally severe winter to the sections graded. It is expected that 40 miles of additional steel will be laid at once from stock. Preparations for building bridges on the section graded from Clinton towards Fort George, and from Fort George towards Clinton, and supplies and plant are being got ready for transport on the 24.5 miles of grading to be completed near the Horse Lake Summit. The total distance from Clinton to Fort George is 263.5 miles. Orders are reported to have been placed

for 4,000,000 ft. of lumber for use in trestles and bridges.

In connection with the building of the line from North Vancouver to Squamish, a public meeting was held May 31, to consider the advisability of having the company's tracks removed from the water front to the Esplanade. Property owners are willing to grant additional land for public purposes if the project can be carried out. (May, pg. 183.)

Quebec Bridge.—It is said that an announcement will be made at an early date as to when the connecting span to join the two arms of the central span of the bridge will be floated into position. The pontoons to carry the span are reported to be nearly ready at Sorel. The span itself is well advanced to completion at the shore shops. The north arm of the span is completed, and but little work remains to be done on the north arm. (June, pg. 223.)

The Regal Collieries are reported to have made considerable progress with the development of some coal mines near Taber, Alta. Among the works being carried out is the building of a spur track from the old Eureka mine, north of the town, to the C.P.R. Grading was reported completed June 6, and the men were working for the delivery of the steel to begin track laying. W. A. Aubin and W. E. Bullock, Taber, are interested in the project.

Toronto, Hamilton & Buffalo Ry.—Grading on the extension of the Smithville-Dunnville branch from the latter point to Port Maitland, is reported to be well advanced. Bridge and culvert work is being gone on with and it is expected that track laying will be started at an early date.

The company is making application to the Minister of Public Works, under the provisions of the Navigable Waters Protection Act, for approval of site and plans for a car ferry dock and slip at Port Maitland, in front of lot A of what was formerly the naval reserve lands. (June, pg. 223.)

Toronto Terminals Ry. Co.—Rapid progress is being made with construction on the new union station on Front St., Toronto. The whole of the concrete foundation work is practically completed. This comprises the putting in of about 500 concrete bases down to rock bottom, and necessitated the use of 5000 cubic yards of concrete. The sub-basements are from 25 to 30 ft. below the street level. The steel work for the superstructure is being rapidly erected, and it is expected to have it completed about the end of July. In this frame work there will be about 30,000 pieces of steel having a total weight of 5000 tons. Four large derricks are being used to handle the material. (April, pg. 139.)

Vancouver, B.C.—A press report states that the Vancouver, B.C., Harbor Board is planning a terminal railway system to link up the Kitsilano Indian reserve with the water front area on Burrard Inlet.

Damage Suit Against the C.P.R.—Judgment was given by Justice Clute recently in the action brought by O. E. Fleming against the C.P.R. to recover \$30,000, present and future damage to gravel beds on the Attrill estate, near Goderich, Ont., caused by the building of a bridge on the Guelph and Goderich Ry. Judgment was given for the plaintiff, with damages to date of judgment of \$600, and in default of either party within 30 days, asking for a reference, all future damages are fixed at \$3,500.

Traffic Orders by the Board of Railway Commissioners.

Charges for Heated Refrigerator Cars.

24994. May 22. Re tariffs of the railway companies showing charges for use of heated refrigerator cars; and order of 24680, Jan. 27, 1916, suspending such tariffs in eastern Canada and from eastern to western Canada. The companies having filed tariffs covering similar service in western Canada, and from western to eastern Canada, it is ordered that the following tariffs showing charges for the use of heated refrigerator cars be suspended pending hearing by the Board, viz.: Canadian Pacific, C.R.O. no. W.2155, C.R.C. no. W-2156, C.R.C. no. 326, C.R.C. viz.: Canadian Pacific, C.R.C. no. W.2155, C.R.C. no. 83; Grand Trunk Pacific, C.R.C. no. 157, C.R.C. no. 158; Canadian Northern, C.R.C. no. W-934, C.R.C. no. W-936.

Mining Students' Rates from Montreal to British Columbia.

25066. June 15. Re orders 12829, Jan. 26, 1911, and 21375, Feb. 17, 1914, authorizing the C.P.R. to grant a special rate of \$40 per capita to a party of mining students from Montreal to Rossland, Phoenix, and Greenwood, B.C., and return or at a rate of \$50 per capita from Montreal to Vancouver and return, including side trips to Rossland, Phoenix, and Greenwood. Upon reading what is filed on behalf of the C.P.R., it is ordered that orders 12829 and 21375 be rescinded.

Interswitching to East End Cattle Market, Montreal.

25074. Re general order 11, July 8, 1908, known as the General Interswitching Order, and the complaint of S. J. Wallace of Beachburg, Ont., that the C.P.R. refused to accept from the Canadian Northern Ry. and switch to the East End Cattle Market in Montreal, a carload of cattle shipped by the complainant via Canadian Northern Ry. from Beachburg to Montreal. Upon hearing the complaint at Ottawa, May 17, 1916, in the presence of counsel for the Canadian Pacific and Canadian Northern Railways, the Montreal Board of Trade and the Canadian Manufacturers' Association being represented at the hearing, and upon reading the written submission filed on behalf of the Canadian Northern Ry. and the report of the Chief Traffic Officer of the Board, it is ordered that, independently of the said General Interswitching Order, and pending the adjustment of the entire switching question, now before the Board, the toll of the C.P.R. for switching live stock from its connection with the Canadian Northern Ry. at Montreal to the East End Cattle Market in Montreal, be \$5 a car. That the C.P.R. be directed to accept such traffic from the Canadian Northern Ry. and perform the necessary switching service over its line to the East End Cattle Market in Montreal, at the toll herein provided.

Master Boiler Makers' Association.

The following officers were elected at the annual convention at Cleveland, Ohio, recently: President, D. B. Lucas, C. B. & Q., Havelock, Neb.; First Vice President, J. B. Tate, Pennsylvania, Altoona, Pa.; Second Vice President, C. P. Patrick, Erie, Cleveland, Ohio; Third Vice President, T. Lewis, Lehigh Valley, Sayre, Pa.; Fourth Vice President, T. P. Madden, Missouri Pacific, St. Louis, Mo.; Fifth Vice President, E. W. Young, C.M. & St. P., Dubuque, Iowa; Secretary, H. D. Vought, New York, and Treasurer, F. Gray, Chicago and Alton, Bloomington, Ill.

Mainly About Railway People Throughout Canada.

S. H. Reynolds, Chairman of the Great Winnipeg Water District Commissioners, died suddenly at Chicago, Ill., June 16.

Lieutenant Wanklyn, who was killed in action in Belgium recently, was a son of F. L. Wanklyn, General Executive Assistant, C.P.R., Montreal.

Thomas Cantley, President, Nova Scotia Steel & Coal Co., has been elected President of the Canadian Manufacturers Association.

A. L. Mohler, President, Union Pacific Rd., will retire from active service on July 1, but will continue to be identified with the system in an advisory capacity.

Baron Shaughnessy left Montreal June 20, with Lady, the Hon. Marguerite, and Mrs. W. J. Shaughnessy, for his summer place, Fort Tipperary, St. Andrews-by-the-Sea, N.B.

T. Duff Smith, Fuel Agent, Grand Trunk Pacific Ry., Winnipeg, has been elected a member of the executive committee of the International Railway Fuel Association, for two years.

F. C. Salter, European Traffic Manager, G.T.R. and Canadian Express Co., London, Eng., has completely recovered from his recent serious illness, and has resumed his full duties.

George Strubbe, City Ticket Agent, Canadian Government Railways, Montreal, committed suicide by shooting, June 1. He is stated to have become mentally unbalanced through business worry.

Howard Brown, a gunner in the Canadian Field Artillery, and son of M. H. Brown, Division Freight Agent, C.P.R., Toronto, who was first reported missing, is a prisoner at Dulmen, Westphalia.

W. M. Godsoe, heretofore Superintendent of Telegraphs, Atlantic Division, C.P.R., St. John, N.B., is on a trip to the Pacific Coast, before entering on his new duties as Commercial Representative, Halifax, N.S.

J. L. Higgins, foreman boiler maker, Prince Edward Island Ry., Charlottetown, who retired recently on the pension fund after 40 years service, was presented with a gold watch, chain and fob by his associates.

Lt. Col. Chas. H. Mitchell, B.A.Sc., M. Can. Soc. C.E., who has been overseas in the Canadian Expeditionary Forces since the early stages of the war, has been made a member of the Distinguished Service Order.

Lieut. T. B. Saunders, of the 74th Battalion, Canadian Expeditionary Forces, who was killed in action early in May, was the eldest son of Dyce W. Saunders, K.C., one of the Michigan Central Rd.'s solicitors at Toronto.

Mrs. G. McL. Brown, wife of the European Manager, C.P.R., presided at a Canadian dinner at the Ladies' Lyceum Club, Piccadilly, London, Eng., recently, at which Canadian officers and others associated with Canada were present.

D. B. Hanna, Third Vice President, Canadian Northern Railway, and Mrs. Hanna, went to New York early in June to see their daughter-in-law off for England, where her husband, Lieut. W. B. Hanna, is with the 92nd Battalion, (Highlanders).

T. J. Kennedy, who is one of the receivers of the Algoma Central and Hudson Bay Ry., of which he was President prior to the receivership, has been confined to his house at Sault Ste. Marie,

Ont., for some little time past, his doctor having advised complete rest.

Acton Burrows, Managing Director, Canadian Railway and Marine World, has been unanimously re-elected chairman of the Canadian Press Association's Trade and Class Section, and also a director of the association and a member of its Postal and Parliamentary Committee.

Jas. Bruce Robb, who is a private in the Canadian Expeditionary Forces, and is a son of W. D. Robb, Superintendent Motive Power, G.T.R., Montreal, received gun shot wounds in the ear and leg while in action recently, and was admitted to the war hospital at Dartford, Kent, Eng. His injuries are not serious.

Elisha Lee, General Superintendent, Philadelphia, Baltimore & Washington Rd. (Pennsylvania System), has been



Lt.-Col. C. W. P. Ramsey, C.M.G.,
O. C. Canadian Overseas Railway Construction Corps.

promoted to the newly created office of Assistant General Manager, Pennsylvania Lines East of Pittsburg. He was born in Chicago in 1870, and is a brother of Frank Lee, Principal Assistant Engineer, C.P.R., Winnipeg.

Thomas C. Irving, Jr., A.M. Can. Soc. C.E., Vice President, Robert W. Hunt & Co., Ltd., consulting and inspecting engineers, who went overseas with the 1st contingent, Canadian Expeditionary Forces, as Captain in the Canadian Engineers, and was later promoted to Major, has been made a member of the Distinguished Service Order.

Captain G. A. E. Bury, of the 106th Light Infantry, Winnipeg, son of George Bury, Vice President, C.P.R., who has been at the front for some 8 months, during most of which time he was on the firing line, has been appointed Deputy Adjutant Quartermaster General at the Canadian Training Division Headquarters in England.

Captain Ian M. W. Sinclair, of the 13th Battalion, son of Angus Sinclair, railway

contractor, Toronto, who was mentioned as having returned to duty after being slightly wounded in the shoulder while in action, and who had been previously wounded in the knee at the Orchard battle, was reported on June 9 to be suffering from shell shock.

H. P. Leslie, a former Assistant General Baggage Agent, G.T.R., Toronto, died at Detroit, Mich., June 6, aged 77. He was for several years in charge of the Great Western Ry. baggage department at Hamilton, Ont., and on the taking over of that line by the G.T.R. was appointed Assistant General Baggage Agent at Toronto, holding that position until 1896, when the department was reorganized on the present basis. He was retained in the service until his retirement in 1906.

Cesaire Senay, whose appointment as Assistant Superintendent, District 3, Eastern Division, C.P.R., Montreal, was announced in our last issue, was born at St. Cesaire, Que., Jan. 31, 1873, and entered C.P.R. service in Oct., 1894, since when he has been, to June, 1902, freight clerk and telegraph operator, Westmount, Que.; Mar., 1903, to Mar., 1904, telegraph operator, Mile End, Que.; Mar., 1904, to July, 1912, agent, Atwater, Que.; July, 1912, to Jan., 1913, agent, St. Henry, Que.; Jan. to Dec., 1913, agent, Mile End, Que.; Dec., 1913, to May, 1916, General Agent, Quebec, Que.

Elroy Theodore Agate, C.E., M. Can. Soc. C.E., who has been appointed Assistant Superintendent, Lake Superior District, Canadian Northern Ry., Capreol, Ont., was born at Pittsford, N.Y., Dec. 7, 1874, and graduated from Cornell University in 1897. He was with the C.P.R. Construction Department from 1897 to 1906, and from 1906 to 1910 was engaged in railway work in British Columbia and Washington State. From July, 1911, to the completion of the line he was engaged as District Engineer, District 1, Port Arthur-Sudbury Line, Canadian Northern Ontario Ry., Sudbury, Ont.

R. W. D. Harris, Trainmaster, C.P.R., who has been transferred from Wilkie, Sask., to Ignace, Ont., and who was born at Victoria, B.C., is the elder son of Dennis R. Harris, M. Can. Soc. C.E., of Victoria, whose wife is the youngest daughter of the late Sir Jas. Douglas, first Lieutenant Governor of British Columbia, who founded and named the city of Victoria. He began work as a clerk in the Bank of British North America at Victoria and in 1905 entered the Mechanical Department, C.P.R., at Revelstoke, B.C. In April 1914 he was appointed Trainmaster at Wilkie, Sask.

Alexander Scott, whose appointment as Resident Engineer, Prince Edward Island Ry., Charlottetown, P.E.I., was announced in our last issue, was born at Kirkcaldy, Scotland, Sept. 6, 1884, and entered railway service May 17, 1911, since when he has been, to Aug. 31, 1911, draughtsman, C.P.R., Montreal; Sept. 1, 1911, to Oct. 15, 1912, draughtsman, C.P.R., Sudbury, Ont.; Oct. 15, 1912, to April 30, 1914, transitman, C.P.R., Sudbury, Ont.; May 1, 1914, to Apr. 1, 1915, chief of survey party, C.P.R., North Bay, Ont.; Apr. 19, 1915, to Apr. 30, 1916, Assistant Engineer, Prince Edward Island Ry., Charlottetown, P.E.I.

Lieutenant Ralph Featherston Lake Osler, who died of wounds received in active service in France early in June, entered C.P.R. service in Jan., 1912, as

a clerk in the President's office, and for a time was secretary to the President. In Nov., 1913, he was transferred to the Kettle Valley Ry., one of the C.P.R. subsidiaries, where he worked under J. J. Warren, President, and the Manager of Construction. In Dec., 1914, he enlisted for overseas service, as a private in the Penticton Company of the 30th Battalion of Victoria, and was promoted to Lieutenant on the field. He was a nephew of Sir Edmund Osler, M.P., director, C.P.R.

G. G. Grundy, General Manager, Temiscouata Railway, who died at Fraser-ville, Que., June 9, 1915, without leaving a will, left the following estate: Interest in Montreal real estate, \$500; promissory notes, \$442; securities for cash, \$12,660; furniture, \$278; automobile, \$1,550; 5 shares Mackinnon-Holmes & Co. stock, \$450; Quebec Central Ry. bonds, \$387; 8 Canadian Mortgage Investment Co., \$704; 74 Dominion Steel Foundry Co., \$3,663; 16 Bank of Commerce, \$3,248; 1,000 Dome Extension Mines, \$80. He held 8,027 shares of stock in other companies which are now valueless. Four brothers, a sister, and two nephews will divide the property.

Ejner L. Landorph, who has been appointed Engineer of Water Service and Tests, Western Lines, C.P.R., Winnipeg, was born at Copenhagen, Denmark, Sept. 9, 1888, and during the summer of 1910 acted as assistant teacher of surveying, etc., at the University of Copenhagen, and in Jan., 1911, graduated from that university as a civil engineer. He entered C.P.R. service June 24, 1912, as draughtsman, Winnipeg, and from Nov. 7, 1912, to Apr. 30, 1913, was transitman, Brandon, Man.; May 1, 1913, to Nov., 1915, Resident Engineer, District 2, Manitoba Division, Brandon; Nov., 1915, to Apr. 1, 1916, Resident Engineer, District 1, Manitoba Division, Kenora, Ont.

Everett Gordon Wickerson, whose appointment as Passenger Agent, Canadian Northern Ry., Prince Albert, Sask., was announced in our last issue, was born at London, Ont., Sept. 27, 1886, and entered railway service Aug. 15, 1906, since when he has been, to Oct., 1906, night operator, C.P.R., Parkbeg, Sask.; Oct. to Nov., 1906, night operator, C.P.R., Pasqua Jct., Sask.; Nov. to Dec., 1906, night operator, C.P.R., West Prince Albert, Sask.; Dec., 1906, to June, 1907, day operator, Canadian Northern Ry., Craik, Sask.; June, 1907, to Apr., 1912, day operator and ticket clerk, C.N.R., Prince Albert, Sask.; Nov., 1912, to Dec., 1915, ticket clerk, C.P.R., Regina, Sask.; Dec., 1915, to May 1, 1916, Passenger Agent, Canadian Northern Ry., Brandon, Man.

Hugh F. Coyle, Superintendent, Districts 5, 6, 7, 8, 9 and 10, comprising the Belleville Division, Ontario Lines, G.T.R., died in his official car, May 31, when returning from Meadville, Pa., to his home at Belleville, Ont. He had been suffering from heart trouble for some time, and during April was granted leave of absence on account of his health. Prior to 1908 he was Assistant Superintendent, District 4 and Montreal Terminals, Eastern Lines, Montreal, and in Jan., 1908, his jurisdiction was extended over District 5. In June, 1912, he was appointed Assistant Superintendent at Belleville, Ont., and in Jan., 1913, was promoted to Superintendent there, which position he retained to the date of his death. The funeral took place at Belleville, June 2.

Jas. Coleman, superintendent, Car Department, G.T.R., who was elected 2nd Vice President, Master Car Builders

Association, at the annual convention at Atlantic City recently, was born in Port Huron, Mich., and started work with the G.T.R. as a car department apprentice in 1873. He worked at Port Huron until 1889, when he was appointed foreman at Chicago, remaining in that position until



Alexander Scott,
Resident Engineer, Prince Edward Island Railway.



C. Senay,
Superintendent, District 3, Eastern Division,
Canadian Pacific Railway.

1899, when he was appointed Master Car Builder, Central Vermont Ry. at St. Albans, Vt. In 1905 he entered the Canada Car Co.'s service at Montreal, taking charge of the manufacturing department, and in 1906 returned to his former position with the Central Vermont. In

Jan. 1908 he was appointed Superintendent, Car Department, G.T.R., at Montreal succeeding W. McWood who retired on pension.

Herbert Gates Reid, who has been appointed Master Mechanic, District 3, National Transcontinental Ry., Transcona, Man., was born at Pembroke, Ont., Oct. 27, 1863, and entered C.P.R. service in Mar., 1884, since when he has been, to Nov. 1884, wiper, North Bay, Ont.; Nov. 1884 to Nov. 1887, fireman, North Bay, Ont.; Nov. 1887 to Dec. 1905, locomotive man, North Bay, Ont.; Dec. 1905 to June 1906, relieving Road Foreman of Locomotives, North Bay, Ont.; June 1906 to Feb. 1907, locomotive man, North Bay, Ont.; Feb. to Apr. 1907, Locomotive Foreman, Chappleau, Ont.; Sept. 1907 to Oct. 1908, District Master Mechanic, District 1, Lake Superior Division, North Bay, Ont.; Oct. 1908 to Apr. 1915, Master Mechanic, Lake Superior Division, North Bay, Ont.; Apr. 1915 to May 1916, Master Mechanic, Saskatchewan Division, Moose Jaw.

Moses A. Fullington, A.M. Can. Soc. C.E., who has been appointed Superintendent, District 5, Eastern Division, C.P.R., Smiths Falls, Ont., was born at Johnson, Vt., May 12, 1880, and entered C.P.R. service in Oct. 1904, since when he has been, to Jan. 1905, rodman, Toronto; Jan. to Oct. 1905, transitman, London, Ont.; Oct. 1905 to Apr. 1907, Assistant Engineer of Terminals, Toronto; Apr. 1907 to Jan. 1912, Resident Engineer, Districts 1 and 4, Ontario Division, Toronto; Jan. 1912 to Jan. 1913, Resident Engineer, Dominion Atlantic Ry., Kentville, N.S.; Jan. to July 1913, Assistant Division Engineer, C.P.R., Montreal; July to Sept. 1913, Assistant Engineer, Eastern Lines, Montreal; Sept. 1913 to Feb. 1915, Assistant Superintendent, District 4, Eastern Division, Ottawa, Ont.; Feb. to May 1915, Assistant Superintendent, District 5, Eastern Division, Smiths Falls, Ont.; May 1915 to June 1916, Superintendent, District 3, Eastern Division, Montreal.

F. E. Dewey, who has been appointed General Manager, Wellsville & Buffalo Rd., Buffalo, N.Y., was born Apr. 22, 1858, and entered railway service Feb. 1875, as messenger, Auditor's office, Central Vermont Ry. He subsequently held various positions with different companies, including General Superintendent, New York and New England Ry. In 1898 he was appointed Superintendent, Midland Division, New York, New Haven & Hartford Rd., Boston, Mass., and later served as General Manager, Detroit & Lima Northern Rd.; General Superintendent of Construction, Missouri & Arkansas Rd. and Arkansas & Choctaw Rd.; and as General Superintendent, St. Louis, Memphis and Southeastern Rd.; Oct. 1903 to May 1905, Vice President and General Manager, Mobile, Jackson & Kansas City Ry.; May 1905 to 1906, Vice President, Suffolk and Carolina Rd.; and later he served as Assistant to the President, Wisconsin Central Rd.

Lieutenant-Colonel C. W. P. Ramsey, commanding the Canadian Overseas Railway Construction Corps, has been created a Companion of the Order of St. Michael and St. George, for service in the field. He was born at Bury, Que., Jan. 15, 1883, and entered C.P.R. service as apprentice in the Mechanical Department, in 1898, at the company's Delormier Ave. shops, Montreal. From that date to Sept. 19, 1903, he served the company in various minor capacities, and on the latter date he was appointed a draughtsman in the Construction Department, Montreal, and

then passed through the various grades of transitman, Assistant Engineer and Division Engineer, until Mar. 15, 1912, when he was appointed Engineer of Construction, Eastern Lines, and continued in that position until Feb. 25, 1915, when he was granted extended leave of absence to take command of the Canadian Overseas Railway Construction Corps. During his connection with the company he was closely identified with the construction of the Lindsay, Bobcaygeon & Pontypool Rd., the Toronto-Sudbury Branch, and the double tracking of a large portion of the Eastern Lines, and lastly he had charge of the construction of the Campbellford, Lake Ontario & Western Ry., which constitutes the C.P.R. Lake Shore Line from Glen Tay to Agincourt, Ont. He has been a member of the Canadian Society of Civil Engineers since 1903, when he entered as a student member, becoming an associate member in 1908.

Charles R. Scoles, General Manager, Atlantic Quebec and Western Ry., and Quebec Oriental Ry., New Carlisle, Que., died at Bermuda recently, after having been in ill health for some time. The funeral took place at New Carlisle, June 2, and was attended, in addition to immediate relatives, by a number of the railway companies' employees. He was born at Grantham, England, Aug. 27, 1856, and educated at Bedford College there. He entered railway service in 1890 as General Manager, Salisbury and Harvey Ry., in New Brunswick, and was later appointed General Manager, Atlantic and Lake Superior Ry. From 1885 he was engaged for several years in railway contract work in New Brunswick, and built the Caraquet Ry., and a portion of the Central Ry. of New Brunswick, in addition to carrying out several contracts on various lines in Quebec. He continued as General Manager of the Atlantic and Lake Superior Ry. throughout its final financial troubles, and the acquirement of the property by the Atlantic, Quebec and Western Ry., and on completion of the deal was appointed General Manager of the A.Q. & W.R., and its provincial company, the Quebec Oriental Ry. He was also associated with the New Canadian Co., railway and general contractors, and with the Gaspé Lumber Co., and other concerns, all of which have become inextricably mixed with the affairs of the Charing Cross Bank of London, Eng., which failed a few years ago, the manager being sentenced to a term of imprisonment for fraud.

Jules Edouard Morazain, whose appointment as Superintendent, District 1, National Transcontinental Ry., Quebec, Que., was announced in our last issue, was born at Wheatland, Que., July 31, 1875 and entered C.P.R. service May 3, 1890, since when he has been, to May 21, 1890, freight clerk, Drummondville, Que.; Aug. 1, 1890, to Jan. 8, 1891, night operator, Foster, Que.; Jan. 9 to Aug. 12, 1891, day operator, Richmond, Vt.; Sept., 1891, to June, 1892, attended college at Sherbrooke, Que.; Aug. 15, to Sept. 26, 1892, night operator, Sutton, Que.; Sept. 26, 1892, night operator, Sutton, Que.; Sept. 26, 1892, to Feb. 9, 1894, night and day operator, Highlands, Que.; Feb. 9 to July 15, 1894, day operator, Richmond, Vt.; July 15 to Oct. 12, 1894, relieving agent and operator at various points; Oct. 12, 1894, to May 27, 1895, day operator, Highlands, Que.; May 27, 1895, to Sept. 24, 1901, agent, Highlands, Que.; Sept. 24, 1901, to Nov. 15, 1908, agent, Mile End, Que.; Nov. 15, 1908, to Feb. 1, 1913, General Agent, Operating Department, Quebec, Que.; Feb. 1 to Dec. 3, 1913, As-

sistant Superintendent, District 3, Eastern Division, Quebec; Dec. 3, 1913, to Feb. 7, 1914, Assistant Superintendent, District 2, Eastern Division, Montreal; Feb. 7 to Oct. 21, 1914, Assistant Superintendent, District 3, Eastern Division, Montreal; Oct. 22, 1914, to Feb. 10, 1915, Acting Superintendent, District 1, Eastern Division, Farnham, Que.; Feb. 11, 1915, to Apr. 1, 1916, Assistant Superintendent, District 3, Eastern Division, Montreal.

Canadian Pacific Railway Construction, Betterments, Etc.

A press dispatch from St. John, N.B., June 17, says the improvements to be carried out during the present season on the Atlantic Division include the construction of a third line from Bay Shore yards to West St. John, construction of storage siding at West St. John, to accommodate 350 additional cars and the replacing of all light steel in tracks and switches with heavier rails to permit use of more powerful locomotives. A new 20,000-gallon water tank will be erected to furnish a reserve supply for locomotives and for fire fighting. Additional sidings will be laid between St. John and Montreal to lessen the possibility of congestion, and two of the larger bridges will be strengthened for use of heavier rolling stock.

We have been officially advised that it has been decided to let the old North Toronto station remain where it is for the present, so that none of the tenders received for its removal were accepted. It has been leased to the City of Toronto for use as a market at the nominal rent of \$1 a year.

The stations and buildings between Toronto and Windsor, Ont., will be repainted this season.

The line between London and Windsor, Ont., will, it is said, be rebalasted this year with dustless ballast.

Tenders are under consideration for filling about 12,500 cubic yards of earth at Gull Lake, on the Transcontinental line, between Swift Current and Medicine Hat, Sask.

It was reported in Moose Jaw, Sask., June 14, that the management had decided to begin construction at once on the section of line, about eight miles, required to convert Vantage, the present terminus of the Moose Jaw-Expanse branch, with the present terminus of the Assiboine branch. Tenders for grading were received June 30.

A press report from Winnipeg, June 15, states that the line now in operation for 75 miles east from Stirling, Alta., will be extended a further 10 miles to Manyberries, this year.

A press report states that the company is preparing to build a concrete dock at Vancouver, B.C., to cost about \$1,500,000. When Pier D, the docks used for the coast service, were planned provision was made for two other wharves between D and A, the docks for trans-Pacific steamers. The new dock will probably be built as part B of the general dockage development scheme. F. W. Peters, General Superintendent, is reported to have said that more space is urgently required to handle the large cargoes which are being consigned to the port for trans-shipment. We are officially advised that the report referred to is somewhat premature. What gave rise to it appears to be the fact that the management had a special study made recently of the dock situation at Vancouver to see if any additional facilities are required. The

management has not yet decided what, if any additions or improvements will be made in the near future. (June, pg. 222.)

Wages Increase on the Canadian Government Railways.

It was reported in Moncton, N.B., June 14, that an increase of 25c. a day had been granted to trackmen on the Intercolonial and the Prince Edward Island Railways, with corresponding increases in other departments, the new rates of pay to date from June 1. The increases are said to vary from 20 to 40c. a day for men paid by the hour, and at the rate of \$5 a month for men paid by the month. The employees affected by the new schedule are said to include freight handlers, station baggage masters, station porters, railway ferry men, locomotive wipers and inspectors, ashpit men, boiler washers, tube cleaners, stationary engine drivers, and firemen and other locomotive house employees, fuel men, store men, watchmen, lamp men, car checkers, janitors, tank men, parlor, sleeping and dining car men, and all classes of employees heretofore covered by the Canadian Brotherhood of Railway Employees' schedule, and several others which are included in the new schedule.

A Winnipeg report of June 16 states that the same increases have been given to employees on the National Transcontinental Ry.

A Moncton despatch of June 14 said:—"Better working conditions and a still further increase of pay are to be discussed within 60 days, and if an agreement is not arrived at, the question is to be submitted to arbitration."

Great Northwestern Ry. of Manitoba Suit.—A settlement, the terms of which were not announced in court, was reached at Winnipeg recently in the action of Delap against the C.P.R. The G.N.W.R. was absorbed by the C.P.R. in 1900, and Mr. Delap, who resides in England, sued the C.P.R., the G.N.W.R., Baron Shaughnessy and R. B. Angus for one-tenth of the G.N.W.R. Co.'s assets. The negotiations for the purchase of the G.N.W.R., in which Mr. Delap owned the controlling interest, were begun in 1898, and a tentative agreement was made, under which he claimed he was to receive \$550,000, out of which he was to discharge the company's outstanding indebtedness. Mr. Delap declined to agree unless he was paid in addition one-tenth of the value of the company's assets, but upon negotiations agreed to retain 500 shares of the capital stock, representing one-tenth of the share capital. The agreement of sale was subsequently assigned by the late G. M. Clarke, then general counsel, C.P.R., who concluded the negotiations, to Sir Thomas Shaughnessy and R. B. Angus. The \$550,000 was paid, but Mr. Delap claimed that when he applied for the registration of the 500 shares of stock in his name a refusal was given. The action was brought to secure these shares.

Railway Lands Patented.—Letters patent were issued during May, in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Calgary & Edmonton Ry.	963.00
Canadian Northern Ry.	1.1 00
Grand Trunk Pacific Ry.	31.25
Grand Trunk Pacific Branch Lines Co.	7.07
Qu'Appelle, Long Lake & Saskatchewan Rd. and Steamboat Co.	3,444.30
Vancouver Power Co.'s railway right of way.	10.02
Total.	4,936.64

Freight and Passenger Traffic Notes.

The Canadian Northern started operating a daily local train service each way between Vancouver and Hope, B.C., June 11.

C.P.R. train 707, from Toronto to Owen Sound, Ont., Mondays and Wednesdays, returning to Toronto, Tuesdays and Thursdays, carries a parlor car.

The Canadian Northern put a daily train service in operations between Edmonton and Calgary, Alta., June 11, replacing the previous tri-weekly service.

The C.P.R. steamship express trains run from Toronto to Port McNicoll, Ont., to connect with the steamships Keewatin and Assiniboia, on their sailing days three times a week.

The Canadian Northern Ry., owing to lack of rolling stock, will not inaugurate a daily transcontinental train service at present, but will maintain the tri-weekly service to Vancouver.

The Canadian Northern started on June 18, running a special Sunday train from Ottawa to points in the Rideau Lakes district. It will be operated during the summer only.

The Grand Trunk, in connection with a general change of trains time on June 25, start running a new train from Toronto for Detroit and Chicago, leaving the union station at 11.30 p.m.

The Canadian Northern started June 11, operating a regular train service to Victoria Beach, Man. A general accommodation train runs on Tuesdays and Fridays, and on Saturdays, two special trains are run.

The Grand Trunk Pacific has started running an additional train between Winnipeg and Prince Rupert. Trains now leave Winnipeg, Tuesdays, Thursdays and Saturdays. The service to Edmonton remains unaltered.

The Canadian Northern put in operation June 11, a bi-weekly service between Edmonton and Alliance, Alta., via Camrose, the trains eastbound running Tuesdays and Thursdays, and westbound Wednesdays and Fridays.

The Grand Trunk Pacific Ry is now operating parlor observation cars between Winnipeg and Prince Rupert, on through trains, but not on trains 1 and 2, between Winnipeg and Edmonton, when there is no through connection with Prince Rupert.

The C.P.R. trains York and Rideau, running between Ottawa Central Station and North Toronto, via Kempton and the Lake Ontario Shore Line (Campbellford, Lake Ontario and Western Ry.) carry buffet library observation and cafe parlor cars.

The National Transcontinental has added to its service a through sleeping car service between Winnipeg and Quebec, the car being detached from and to the National train to and from Toronto at Cochrane, and being run over the N.T.R. to Quebec.

The Board of Railway Commissioners opened a sitting in Winnipeg, June 12, to hear the application of the Canadian Pacific, Canadian Northern, and Grand Trunk Pacific, to increase general merchandise freight rates from Winnipeg, Portage la Prairie and Brandon to Manitoba points.

Freight and passenger traffic on the National Ry. of Mexico, which has been interrupted for several months, is reported to have been resumed June 9, be-

tween Torreon and Aguas Calientes, and it was said that train service between Mexico City and Juarez would be resumed by the end of the month.

The Canadian Government Railways, National Transcontinental section, put in operation its Great Lakes Express service, starting from Winnipeg June 17, at 10.30 p.m., and from Fort William, June 18 at 5.00 p.m. The service is a tri-weekly one, leaving Winnipeg Tuesdays, Thursdays and Saturdays, and Fort William Mondays, Wednesdays and Fridays.

A press report stated recently that as soon as track connection between the Michigan Central Rd. and the London & Port Stanley Ry. was made at St. Thomas, a through sleeping car service would be inaugurated to and from London, via the two lines mentioned. We are advised by officials of both the lines that the question has not even been considered.

In order to avoid congestion at the ticket offices in the union station, Toronto, the baggage checking room on the west side of the Front St. entrance, is to be converted into ticket offices for the C.P.R. and Canadian Northern. The ticket offices on the east side of the main entrance, at present used by the C.P.R. and the G.T.R., will be used entirely by the G.T.R.

The important alterations for the summer on the C.P.R. lines east from Montreal include the starting of the Halifax express at 7 p.m., instead of 7.15 p.m.; the resumption of service of the Twilight Express to Quebec, starting from either end at 5 p.m.; and the resumption of the night express service to Portland, Scarborough Beach, Old Orchard and Kennebunkport, Me., leaving Montreal 9 a.m., and arriving in that city 7.25 a.m.

The most important feature of the C.P.R. summer train service, which went into operation June 4, was the putting on of a new train, no. 635, known as the Michigan Special, leaving Toronto 11.50 p.m., for Detroit and Chicago. It carries the local Detroit sleeping car, heretofore handled on train 20. A new train, the Queen City Special, leaves London, Ont., at 9 a.m., and arrives in Toronto at 12.15 p.m., in connection with which the local service between London, Chatham, Windsor and Detroit has been improved.

The Canadian Government Railways announce that ferry service from Riviere Ouelle Wharf, Que., to Murray Bay points eastbound will hereafter be operated in connection with train no. 4, leaving Montreal 8.15 a.m., arriving Murray Bay via steamboat Champlain at 7 p.m. same day. Westbound there will be no change in the ferry service, steamboat Champlain leaving Murray Bay 7 a.m., connecting with no. 3 Maritime Express due Montreal 6.30 p.m. same day, as previously.

The J. D. McArthur railway lines in Alberta have at present a total operating length of 745.5 miles, the longest being the Edmonton, Dunvegan and British Columbia from Edmonton to Spirit River, 357 miles, with a branch from Spirit River to Grande Prairie 49.8 miles. The Alberta & Great Waterways starts from the E.D.&B.C. at Carbondale, mileage 14.4 from Edmonton, and extends to McMurray, mileage 290.2, the most important midway point being Lac la Biche, mileage 113.2. The Central Canada starts from the E.D.&B.C.R. at McLennan, mileage 262.2.

At Board of Railway Commission's sitting at Saskatoon, Sask., June 16, a letter was read from M. H. MacLeod, General Manager and Chief Engineer, Canadian Northern, giving an undertaking to move the balance of the 1915 grain crop from the Goose Lake territory by July 31. To do this arrangements were made with other railways to secure 300 cars a day, which with the company's own cars would enable 700 cars a day to be moved. Ten train a day would be run, and if these could not be moved over the company's own lines, they would be handed over to other companies.

The Canadian Government Railways, National Transcontinental section, put in operation a new train service between Quebec, Que., and Cochrane, Ont., the first train leaving Cochrane June 12, and Quebec June 13. The service is tri-weekly, leaving Quebec Tuesdays, Thursdays and Saturdays at 2 p.m., and Cochrane Mondays, Wednesdays and Fridays at 7.15 p.m. Connection is made at Cochrane with the train to and from Winnipeg, known as the National, operated from Toronto to Winnipeg, via the G.T.R., the Timiskaming & Northern Ontario Ry., and the National Transcontinental Ry.

The Canadian Government Railways, National Transcontinental Division, commenced a train service June 11 from Quebec to Cochrane, making connection there for Winnipeg. Westbound trains leave Quebec on Tuesdays, Thursdays and Saturdays at 2 p.m., arriving at Cochrane at 4.10 p.m. on Wednesdays, Fridays and Sundays, and at Winnipeg at 4.30 p.m. Thursdays, Saturdays and Mondays. Eastbound trains leave Winnipeg Tuesdays, Thursdays and Sundays at 5.15 p.m., Cochrane Wednesdays, Fridays and Mondays at 7.15 p.m., and arrive at Quebec Thursdays, Saturdays and Tuesdays at 9.10 p.m. The trains between Quebec and Cochrane will be known as Western and Atlantic respectively when westbound and eastbound, and from Cochrane to Winnipeg they will be known as Western National and National Atlantic respectively.

The C.P.R. Imperial Limited trains handle all classes of traffic between Montreal and Winnipeg, but carry sleeping car passengers only, from Winnipeg to Revelstoke, B.C. When the summer time table was put in operation, June 4, no alteration was made in the time of starting from Montreal—10.15 p.m.—but the train eastward leaves Vancouver at 20.30 K. (8.30 p.m.) half an hour later than the winter schedule, and arrives at Montreal at 8 a.m. instead of 9.20 a.m. The Trans-Canada train leaves Toronto, under the summer schedule, at 6.40 p.m., the same time as during the winter, but arrives in Vancouver 15 minutes earlier, viz., at 21.15 K. (9.15 p.m.), while the corresponding train eastward leaves Vancouver at 8.25 K., instead of 9 K., and arrives at Toronto 12.30 p.m., instead of 4.15 p.m. The Montreal-Sudbury trains connecting with the Trans-Canada, resumed running June 5 and 6. These two trains have sleeping cars from Montreal attached, which are carried through on the Trans-Canada to Winnipeg and beyond. The summer trains starting from St. Paul, and Minneapolis, Minn., to Seattle, Wash., and Vancouver, B.C., were also resumed June 4.

The New York Central Rd. has removed its Toronto city office from 80 Yonge St. to Dominion Bank Building, 70 Yonge St. Frank C. Foy, Canadian Passenger Agent, is in charge.

Opening of North Toronto Station, Canadian Pacific Railway.

The new station at North Toronto, which is being built by the C.P.R., although not fully completed, was officially opened for traffic June 14, when train 24 left at 10 p.m. for Montreal via Peterborough, carrying also Ottawa sleeping cars. A. D. MacTier, General Manager, Eastern Lines, who came to Toronto for the opening, was entertained at dinner at the National Club, with a number of other guests, by the Mayor and city council, after which the party proceeded to the new station, every portion of which, including the platforms, was thronged with spectators. Speaking from a dais erected in the main wait-

Ottawa via Belleville and Kempton, at 1.55 p.m.; no. 713 for Teeswater, via Streetsville, at 4.45 p.m.; no. 608 for Lindsay at 5.15 p.m., and no. 707 for Owen Sound, via Bolton, at 5.25 p.m. The other arriving trains are no. 605 from Lindsay at 10.30 a.m.; no. 708 from Owen Sound at 8.10 p.m.; and no. 714 from Teeswater via Streetsville at 8.45 p.m.; and the York, from Ottawa via Kempton and Belleville, at 9.20 p.m.

The new station forms part of the whole general scheme of track elevation across the north end of the city, which is now approaching completion, involving the raising of the tracks for about 4

West Toronto, and about four years ago the C.P.R. decided to make use of the line from North Toronto to Leaside Jct. for passenger traffic, starting therefrom one of its Toronto-Montreal night trains, and running one of the Montreal-Toronto night trains into it. This proved such a success that a further development of the northern entrance was decided on. The smallness of the existing station made necessary further accommodation, the result of which is the new station, which is now almost complete. This station has been designed on a larger scale than would be required for C.P.R. traffic alone, as the Canadian Northern



Fig. 1. North Toronto Station, Canadian Pacific Railway.

This view, made from the architect's drawing, does not show the butterfly roofs over the platforms extending along the north side of the station and over the subway. They will be shown in another view, which will be published in *Canadian Railway and Marine World* as soon as the tower is completed, and the whole building, etc., can be photographed in a finished condition.

ing room the Mayor introduced Mr. MacTier, who spoke briefly, and was followed by Sir James Carroll and C. J. Parr, M.P., of New Zealand, and several members of parliament and members of the city council. The Mayor then declared the station open and the party proceeded upstairs to one of the platforms to see train 24 start sharp on time.

At present five trains leave the station each week day and five arrive, the Sunday service being one train out and one in. In addition to the Toronto-Montreal train, leaving at 10 p.m. as above mentioned train 23 from Montreal via Peterborough, carrying also Ottawa sleeping cars, arrives at 8 a.m. The other departing trains are the Rideau, for

miles, with the elimination of all grade crossings. The North Toronto line has for a number of years been used by the C.P.R. principally as a freight cut off between Leaside Jct. and West Toronto from which points the main line runs down to the union station in the lower part of the city. Originally the Leaside-West Toronto line was the only entrance into Toronto of the Ontario & Quebec Ry., which was absorbed by the C.P.R. in its early days, and subsequently a connection was built from Leaside Jct. to connect with the union station, and all passenger trains from the east were run over it. For several years a connecting stub line service was operated both ways between Leaside Jct., and

in planning a permanent entrance into Toronto decided on the northerly entrance, arrangements being made with the C.P.R. to build the station, the C.N.R. to use it jointly as tenants. It is the Canadian Northern's intention to use this station for most, if not all, of its Toronto passenger service, but the C.P.R. will retain its connection with the present union station near the waterfront, only using the North Toronto station for certain trains.

A perspective of the new station is shown in fig. 1; a ground floor plan in fig. 2; and the trackage arrangement in the station vicinity, with its relation to the city transportation conveniences, in fig. 3. The station is located on the east

side of Yonge St., at the present end of the Toronto Ry.'s Yonge St. line, which passes down through the centre of the city. With this convenient and through street car line, the new station is very easily reached from the business centre of the city. The rapid growth of the city

and stone structure, the central section of which has a high roof, flanked by two lower sections containing the station facilities. On the Yonge St. side there is being built a 140 ft. clock tower, the 30 ft. spire of which will be of terra cotta. The station building is 114 x 76

waiting room on the west are the ticket offices and telegraph offices. Flanking the east side of the waiting room are the women's room, smoking room, lavatory facilities, and telephone booths. Adjoining the waiting room in the north-east corner are the news stand and staff

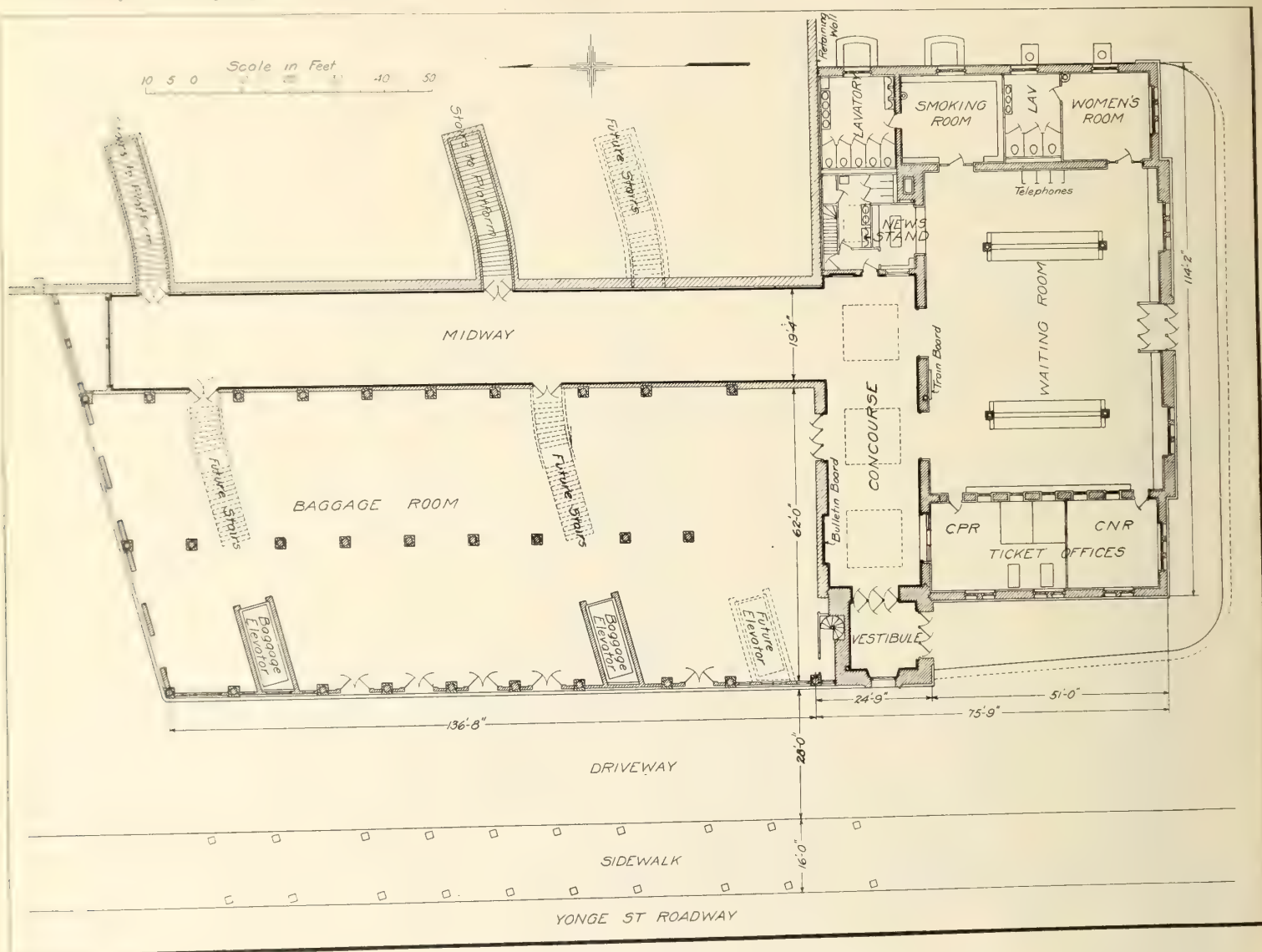


Fig. 2. Ground Plan, North Toronto Station, Canadian Pacific Railway.

The stairs near the south east end of the midway, shown in the above plan as "future stairs," have been built. The two projected stairs on the west side of the midway, also shown as "future stairs," have not been built.

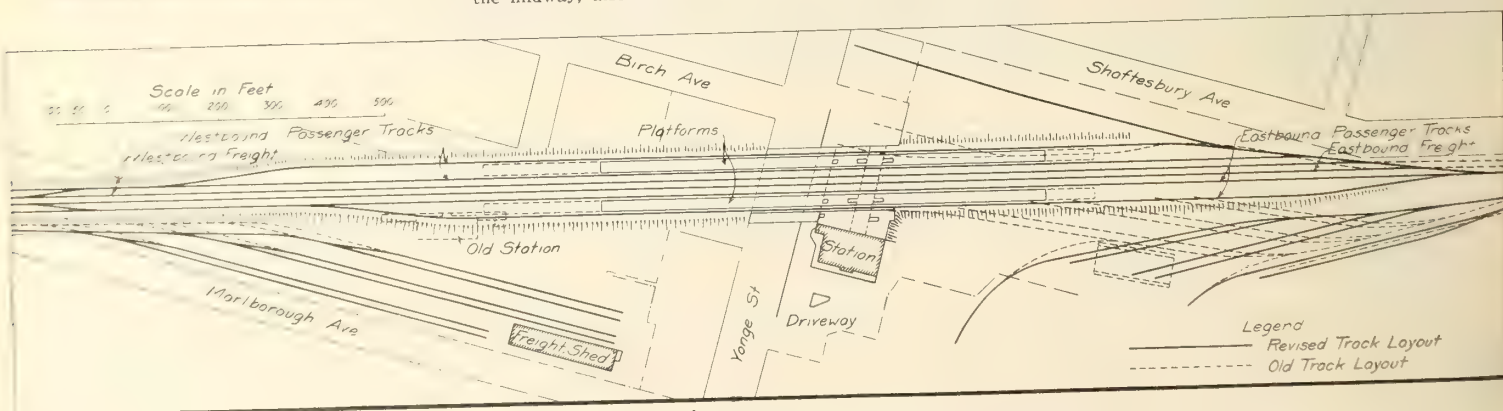


Fig. 3. Track Arrangement, North Toronto Station, Canadian Pacific Railway.

northward makes the North Toronto location particularly available for that section of the city, the new location being more centrally located with regard to the centre of population than the present down town union station.

The new station is a single story brick

ft., the broader side facing south, with the tracks on the north side passing it at an angle of about 15 degrees. The central or high section of the station is the main waiting room, 70 x 51 ft., with a centrally located entrance from the driveway on the south side. Flanking this

lavatory. Directly opposite the main entrance to the midway under the tracks. The vestibule under the tower leads into the concourse along the north side of the west end of the waiting room, connecting at its east end with the midway. The south and west sides of the station have

sidewalks with metal canopies, so that passengers may either alight at the main entrance centrally on the south side, or at the tower vestibule, the expectation being that the latter entrance will be used by the majority of passengers who have already secured their tickets, and only require to pass directly to the trains, relieving the main waiting room of much of the congestion that might otherwise occur. Along the west side of the station is a 28 ft. driveway, so that vehicles may drive up to either station entrance, and pass through under the tracks through this driveway and out on Yonge St. to the north of the station.

The midway is a passage 20 ft. wide passing from the rear of the station to the far side of the tracks, under the latter. The elevation of the tracks makes a difference in grade between the track platforms and the station level of 15½ ft., giving a headway in the midway of about 14 ft.

Passing over the midway are 6 through tracks, which now connect with two main tracks to the west and a single track to the east, but are so located as to connect in the future with the proposed double track to the east on the revised grade. The northerly two tracks are for westbound trains and the southerly two for eastbound trains, each pair being at 31 ft. centres and tributary to a single platform. The two centre tracks at 13 ft. centres from each other and from the adjoining passenger ones are not tributary to a platform and are reserved for freight or other through train movements, the southerly one for eastbound and the northerly one for westbound. As all passenger trains will originate and terminate at the West Toronto yards and may stand in the North Toronto station for a considerable time, this arrangement gives the greatest possible flexibility in operation, by assigning certain tracks for standing trains and keeping certain others open for through movements at all times.

The platforms are 20 ft. 3½ in. wide and 600 ft. long to accommodate 10-car trains. The portions over the baggage room and subways are of reinforced concrete, and the remaining portions are of wood which will be replaced with concrete when the fill upon which they are built has settled. When traffic requirements warrant, they may be extended to a maximum length of 1,600 ft., thus permitting each platform track to accommodate two trains, or a total of four eastbound and four westbound trains clear of the through tracks.

Butterfly, or inverted umbrella roofs, some 360 ft. long, extend over the concrete portions of the platforms, protecting access to the stairways and elevators. When the fill settles sufficiently to give proper foundation, they will be extended to cover the full length of the platforms. The roof proper is of wood, on a steel frame, which is supported by steel posts in the middle of the platforms. It has a spread of 25 ft. and extends well over cars standing on the platform tracks, thus giving, in many respects, the same protection as the Bush type of train shed when trains occupy the platform tracks. The platforms are reached from the midway by three 6 ft. stairways on the east side. The plans provide for future stairways opposite the present proposed stairways.

The baggage room, 137 x 62 ft., occupies all the section beneath the tracks between the midway and Yonge St. driveway. From the latter the baggage is received through 5 doorways, and is

raised on trucks to the platform level by three 15 x 5½ ft. elevators. From the southwest corner of the baggage room a spiral stairway ascends to the track level, where the station master's office is located in the tower above the vestibule. Passenger communication with the baggage room is through the concourse.

The whole exterior of the building, with the exception of the spire, is faced with limestone from Tyndall, Man. The choice of this Canadian stone has been justified by the excellent color effect of the masonry in the mass, an effect equal to any that could have been obtained by the importation of the better known building stones from the United States. The spire on top of the tower will be faced with terra cotta of a color and texture to tone in with the limestone facing of the remainder of the building. The section under the tracks is of steel and concrete construction.

The main waiting room, tower vestibule and concourse are lined with marble for their entire height, the architectural effect being obtained by the use of different colored marbles, all set in practically the same plane, so as to avoid as far as possible all offsets and other dirt collecting projections. The plaster ceiling of the main waiting room is treated in a broad manner with large panels. The midway is lined with glazed brick for its full height, as are the staircases heading up to the platforms.

A complete system of electric clocks of British manufacture will be installed; of these the large tower clock with four 8 ft. dials will form a part. The clocks throughout the building will be controlled by a master clock which will be synchronized daily from the company's chief time station at Montreal.

All ornamental ironwork such as door frames, stairs, large windows and the marquise on the south and west fronts has been executed by a Toronto firm and all the steel sash throughout the building have been imported from England. The plastering, marble, heating, ventilating, plumbing and electric work has all been carried out by Toronto firms. Wherever possible, and there are but few exceptions, all materials and labor employed in the construction of the building are of Canadian or British origin, and, in accordance with the company's requirements, Canadian timber has been used for all woodwork, whether rough lumber or finished mill work.

The plans were prepared by Darling & Pearson, architects, Toronto, under the J. M. R. Fairbairn, Assistant Chief Engineer, C.P.R., and D. H. Mapes, Engineer of Building, C.P.R. The contractors are P. Lyall & Sons Construction Co. Ltd.

The track elevation work, which included extensive baggage room and roadway construction under the tracks, was carried out under the charge of Blair Ripley, M.Can.Soc.C.E., Engineer of Grade Separation, C.P.R., now Officer Commanding No. 1 Overseas Construction Battalion.

The Board of Railway Commissioners held sittings for hearing complaints as follows: Winnipeg, June 12; Saskatoon, Sask., June 14; Quebec, Que., June 17; Edmonton, Alta., June 15; Vancouver, B.C., June 26; Victoria, B.C., June 28; Montreal, June 28. Sittings will also be held as follows: Nelson, B.C., July 5; Calgary, Alta., July 10; Moose Jaw, Sask., July 12; Regina, Sask., July 13; Winnipeg, July 14; Fort William, Ont., July 17; Sudbury, Ont., July 19.

Canadian Northern Railway Guaranteed Securities.

In the article in Canadian Railway and Marine World for June on "Further Dominion Aid to the Canadian Northern Ry. and the Grand Trunk Pacific Ry.," onpg. 225, in the second paragraph under the heading "Returns to Parliament," line three, reference was made to the "Total amount of stock outstanding," while at the end the word "securities" was used. The word "stock" was used inadvertently instead of securities, which word was used in the return submitted in the House of Commons by the Minister of Finance. As generally understood the word "stock," refers to shares or common stock, and not to bonds, debentures or other securities which are secured by mortgage, guarantee or otherwise, and a correspondent contends that even the word "securities" does not properly express the character of the C.N.R.'s outstanding indebtedness mentioned in the return.

As mentioned above the word "securities" was used in the return submitted to Parliament, and if our correspondent feels very much excited about it use he should communicate with the Minister of Finance, instead of with us.

The return referred to, which is in the form of a sessional paper, is headed "Statement of Securities Outstanding." The securities listed include bonds of different kinds, 1st mortgage stock, 1st mortgage debenture stock, terminal debenture stock, branch lines stock, second charge stock, perpetual consolidated debenture stock, and perpetual debenture stock.

In the table at the conclusion of the second paragraph referred to the total amount of securities issued was stated as \$383,770,798. This was made up by adding the \$25,000,000 of income bonds to the \$358,770,798 of guaranteed and unguaranteed securities issued. The total guaranteed and unguaranteed securities authorized amount to \$383,438,742.

Canadian Ticket Agents' Association.

The Association's annual outing was held at Port Arthur, Ont., June 12 and 13. The party, numbering about 200 arrived in the city on the Northern Navigation Co.'s steamship Hamonic from Sarnia, and were received by a reception committee of the city council and the board of trade. After the formal reception the members held the annual business meeting, and the ladies were taken for auto trips in the city, and were entertained in the evening by the Women's Canadian Club. The members held their annual smoking concert on June 12, and on June 13, the entire party were taken on a trip around the bay on the tug Whalen, and in the afternoon went via the Canadian Northern Ry. to Kakabeka Falls. They returned east by the C.P.R. steamship Assiniboia to Port McNicoll.

The following were elected officers at the annual meeting, all being located in Ontario:—President, A. M. Hare, Tillsonburg; 1st Vice President, E. R. Blow, Whitby; 2nd Vice President, H. F. Whittier, Trenton; 3rd Vice President, J. Ransford, Clinton; Secretary-Treasurer, E. de la Hooke, London; Auditor, B. Caswell, Smiths Falls. Executive Committee, J. Jackson, Clinton; W. McIlroy, Toronto; W. J. Moffatt, Toronto; F. W. Churchill, Collingwood; C. B. Janes, Orillia.

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Atlantic Quebec and Western Ry., Quebec Oriental Ry.—J. S. GORDON, Assistant General Manager, is acting as General Manager, consequent on the death of C. R. Scoles. Office, New Carlisle, Que.

Canada Steamship Lines, Limited.—THOMAS HENRY, heretofore Passenger Traffic Manager, has been appointed Superintendent of Hotel Department, Office, Montreal.

Canadian Northern Ry.—In consequence of the sale of the C.N.R. steamships to the Cunard Steamship Co., WILLIAM PHILLIPS, European Railway and Steamship Manager, will return to Toronto in the near future and will be given an important appointment in the Traffic Department.

A. McCOWAN, Supervisor of Car Work, Western Lines, Winnipeg, has had his jurisdiction extended over the Eastern Lines, and advises division officials in regard to staff and general efficiency of operation, and also instructs station officials in respect of maintenance of standards and methods of performing work.

E. H. DREW, heretofore Inspector, Sleeping, Dining, and Parlor Cars, Hotels and News Department, Winnipeg, has been appointed Inspector, same department, Ottawa.

G. C. HEARTS, heretofore Erecting Shop Foreman, Trenton, Ont., has been appointed Locomotive Foreman, Toronto, vice S. L. Tracey, assigned to other duties.

E. T. AGATE, C.E., M.Can.Soc.C.E., formerly District Engineer, District 1, Port Arthur-Sudbury Line, Sudbury, Ont., has been appointed Assistant Superintendent, Lake Superior District. Office, Capreol, Ont.

A. PATRICK, heretofore platform inspector, Sleeping, Dining, and Parlor Cars, Hotels and News Department, Winnipeg, has been appointed Inspector, same department there, vice E. H. Drew, transferred.

W. A. SPEAR has been appointed platform inspector, Sleeping, Dining, and Parlor Cars, Hotels and News Department, Winnipeg, vice A. Patrick, promoted.

H. COLEY has been appointed Sleeping, and Parlor Car Hotel and News Department, Edmonton, Alta., vice G. H. Cullingford, transferred to the linen room, at Winnipeg.

W. A. EAGLESON has been appointed Roadmaster, with jurisdiction Lucerne, B. C., to Tollerton, Alta., including Lucerne yard. Office, Lucerne, B.C.

H. A. MACKENZIE has been appointed Roadmaster, with jurisdiction Blue River to Lucerne, including Blue River yard. Office, Blue River, B.C.

J. WARK has been appointed Roadmaster, with jurisdiction Kamloops to Blue River, including Kamloops yard. Office, Kamloops, B.C.

A. ANDERSON, Roadmaster, Boston Bar, has had his office changed to Kamloops, B.C.

A. H. DAVIS, heretofore City Passenger Agent, Winnipeg, has been appointed General Agent, St. Paul, Minn., vice E. P. Wright, who has left the company's service.

Canadian Pacific Ry.—J. R. GILLILAND, heretofore Superintendent, District 5, Eastern Division, Smith's Falls, Ont., has been appointed Superintendent, District 2, Atlantic Division, vice R. McKillop, transferred. Office, Woodstock, N. B.

R. McKILLOP, A.M.Can.Soc.C.E., heretofore Superintendent, District 2, Atlantic Division, Woodstock, N.B., has been appointed Superintendent, District 3, Eastern Division, vice M. A. Fullington, A.M.Can.Soc.C.E., transferred. Office, Montreal.

W. M. NEAL, heretofore Car Service Agent, Montreal, has been appointed Assistant Superintendent, District 2, Eastern Division, vice W. B. Brown, transferred. Office, Montreal.

J. E. RYAN, heretofore Chief Dispatcher, District 1, Ontario Division, Toronto, has been appointed Car Service Agent, Eastern Division, vice W. M. Neal, promoter. Office, Montreal.

E. G. MOORHEAD, heretofore secretary to Superintendent, District 2, Ontario Division, London, has been appointed secretary to General Superintendent, Eastern Division, Montreal.

O. R. BURNS, heretofore Agent, St. Mary's, has been appointed Travelling Freight Agent, Montreal.

W. J. ALLEN, heretofore passenger car painter, has been appointed leading hand painter, West Toronto, vice T. Marshall, transferred to Angus Shops, Montreal.

C. A. WHEELER, heretofore Locomotive Foreman, MacTier, Ont., has been appointed Locomotive Foreman, Ottawa, Ont.

M. A. FULLINGTON, A.M.Can.Soc.C.E., heretofore Superintendent, District 3, Eastern Division, Montreal, has been appointed Superintendent, District 5, Eastern Division, vice J. R. Gilliland, transferred. Office, Smiths Falls, Ont.

K. deS. JOSEPH, Assistant Trainmaster, District 1, Atlantic Division, Brownville Jct., Me., has been appointed acting Trainmaster, District 1, Ontario Division, during the absence on sick leave of A. G. McLeod. Office, Havelock.

T. MULLINS, heretofore City Passenger Agent, Ottawa, has been appointed City Passenger Agent, Toronto, vice W. McLroy.

W. McILROY, heretofore City Passenger Agent, Toronto, has been appointed Chief Clerk, Passenger Department there, vice H. W. Mathewson, promoted.

D. A. SMITH, heretofore Travelling Freight Agent, Hamilton, Ont., has been appointed Travelling Freight Agent, Toronto, vice J. W. Maguire transferred.

J. TREGASKIS, heretofore Assistant Locomotive Foreman, Lambton, Ont., has been appointed Night Locomotive Foreman there, vice S. Illingsworth, transferred.

J. DODD has been appointed Assistant Locomotive Foreman, Lambton, Ont., vice J. Tregaskis, promoted.

J. W. MAGUIRE, heretofore Travelling Freight Agent, Toronto, has been appointed Travelling Freight Agent, Hamilton, Ont., vice D. A. Smith, transferred.

S. ILLINGSWORTH, heretofore Night Locomotive Foreman, Lambton, Ont., has been appointed Locomotive Foreman, MacTier, Ont., vice C. A. Wheeler, transferred.

R. W. SCOTT, heretofore chief clerk to Lines, Montreal, has been appointed As-

sistant Superintendent, District 1, Lake Superior Division. Office, Sudbury, Ont.

R. W. D. HARRIS, heretofore Trainmaster, Wilkie, Sask., has been appointed Trainmaster, District 1, Manitoba Division, vice R. McGregor. Office, Ignace, Ont.

M. BLACK has been appointed Resident Engineer, District 1, Manitoba Division, vice E. L. Landorph, promoted. Office, Kenora, Ont.

J. A. PANTHER, heretofore acting Trainmaster, Calgary, Alta., has been appointed Trainmaster, Kenora, Ont.

E. L. LANDORPH, heretofore Resident Engineer, District 1, Manitoba Division, Kenora, Ont., has been appointed Engineer of Water Service and Tests, Western Lines, vice V. J. Melsted, resigned. Office, Winnipeg.

W. BANNON, heretofore Assistant Yardmaster, Winnipeg, has been appointed Night General Yardmaster there, vice H. Hicks, whose appointment as General Yardmaster, Fort William, Ont., was announced in our last issue.

J. N. MURPHY, heretofore Trainmaster, Medicine Hat, Alta., has been appointed Roadmaster, with jurisdiction over Rapid City, Minn., and Lenors Subdivisions and Brandon yard, vice J. McRae, transferred. Office, Brandon, Man.

J. McRAE, heretofore Roadmaster, Brandon, Man., has been appointed Roadmaster, District 4, Manitoba Division. Office, Souris.

J. A. BERRY, heretofore Car Service Agent, Montreal, has been appointed Car Service Agent, Moose Jaw, Sask., vice G. T. Coleman, whose appointment as Car Service Agent, Toronto, was announced previously.

C. HOOD, heretofore Trainmaster, Nelson, B.C., has been appointed Local Freight Agent, Saskatoon, Sask., vice S. C. Graham, transferred.

S. C. GRAHAM, heretofore Local Freight Agent, Saskatoon, Sask., has been appointed Trainmaster, District 3, Saskatchewan Division, vice R. W. D. Harris, transferred. Office, Wilkie.

D. ENGLAND, heretofore Trainmaster, District 2, Manitoba Division, Winnipeg, has been appointed Trainmaster, District 3, Alberta Division, vice J. M. MacArthur, whose appointment as Superintendent, District 1, Manitoba Division, Kenora, Ont., was announced in a recent issue. Office, Calgary.

A. L. POWELL, heretofore station ticket agent, Moose Jaw, Sask., has been appointed District Passenger Agent, Banff, Alta.

M. D. JORDAN, heretofore in Car Department, Vancouver, B.C., has been appointed Car Foreman, Field, B.C., vice C. J. Crozier, transferred.

For changes in C.P.R. Telegraphs officials see under "Telegraph, Telephone, and Cable Matters," on page 299.

Central Vermont Ry.—G. W. GROOM, heretofore Assistant to Superintendent and Chief Dispatcher, has been appointed Assistant Superintendent, vice J. F. Keefe, resigned. Office, St. Albans, Vt. The position of Assistant to Superintendent has been abolished.

E. T. BUCK has been appointed Chief Dispatcher, St. Albans, Vt., vice G. W. Groom, Assistant to Superintendent and Chief Dispatcher, promoted.

Grand Trunk Ry.—F. J. MILLER has been appointed Assistant Superintendent,

Montreal Terminals. Office, Bonaventure Station, Montreal.

J. C. CARRUTHERS, heretofore in Westinghouse, Church, Kerr Co.'s service at Drummondville, Que., has been appointed ticket agent, G.T.R., Prescott, Ont., vice P. B. Whiteley, enlisted for overseas service.

J. D. McMILLAN, heretofore Trainmaster, Lindsay, Ont., has been appointed Superintendent, Districts 5, 6, 7, 8, 9, and 10, comprising the Belleville Division, vice H. F. Coyle, deceased. Office, Belleville, Ont.

Grand Trunk Pacific Ry.—H. REID, formerly at Edmonton, Alta., has been appointed Car Foreman, Rivers, Man. This is a new position.

F. W. BEHAN, heretofore erecting shop foreman, Transcona, Man., has been appointed Locomotive Foreman, Regina, Sask.

W. SILVERWOOD, heretofore Car Foreman at Edmonton, Alta., has been appointed Car Foreman, Melville, Sask., vice C. A. Munro, transferred.

C. A. MUNRO, heretofore Car Foreman, Melville, Sask., has been appointed Car Foreman, Edmonton, Alta., vice W. Silverwood, transferred.

G. W. WILSON has been appointed Car Foreman, McBride, B.C., vice C. McKinnon, enlisted for overseas service.

D. E. SMITH, heretofore Locomotive Foreman, Regina, Sask., has been appointed Locomotive Foreman, Prince Rupert, B.C.

Michigan Central Rd.—W. HEARD, heretofore Assistant Divisional Storekeeper, London, Ont., is reported to have been appointed Divisional Storekeeper there, vice A. A. Drake, who has retired, after 33 years service.

National Transcontinental Ry.—W. S. STILLWELL, heretofore at Transcona shops, has been appointed Car Foreman, Graham, Ont., vice G. E. Decker, resigned.

J. B. SMITH has been appointed Trainmaster and Chief Dispatcher, District 3, Graham, Ont.

W. A. HILL has been appointed First Trick Dispatcher, Graham, Ont., vice H. M. Bird, assigned to other duties.

J. BIRSE, heretofore District Master Mechanic, District 3, has been appointed Road Foreman of Locomotives, Graham, Ont.

H. G. REID, heretofore Master Mechanic, Saskatchewan Division, C.P.R., Moose Jaw, has been appointed Master Mechanic, District 3, N.T.R., vice J. Birse, transferred. Office, Transcona, Man.

M. F. SCOTT, heretofore charge hand in erecting shop, has been appointed Foreman, Erecting Shop, Transcona, Man.

New York Central Rd.—A. S. INGALLS, heretofore General Superintendent, District 3, Cleveland, Ohio, has been appointed Assistant General Manager, Lines West of Buffalo. Office, Cleveland, Ohio. This is a new position.

R. H. CROLY, heretofore Division Freight Agent, Buffalo, N.Y., has been appointed Assistant General Freight Agent, in charge of freight traffic to and from territory on and adjacent to the Niagara frontier, N.Y.C.Rd. and West Shore Rd. Office, Buffalo, N.Y.

F. F. RIEFEL, heretofore Superintendent Telegraph, Cleveland, Ohio, has been appointed Superintendent, Detroit Division, vice E. R. Bissell, transferred. Office, Detroit, Mich.

F. M. SMITH, heretofore Superintendent, Western Division, Chicago, Ill., has been appointed General Superintendent, District 3, vice A. S. Ingalls, promoted. Office, Cleveland, Ohio.

R. F. FINLEY has been appointed Superintendent of Telegraph, N.Y.C.R., L. E. & W.R., and Western Union Telegraph Co., vice F. F. Riefel, transferred. Office, Cleveland, Ohio.

E. R. BISSELL, heretofore Superintendent, Detroit Division, Detroit, Mich., has been appointed Superintendent, Western Division, vice F. M. Smith, promoted. Office, Chicago, Ill.

Oregon-Washington Rd. and Navigation Co.—J. H. CUNNINGHAM, heretofore Travelling Freight and Passenger Agent, Seattle, Wash., has been appointed in charge of the recently opened office at Vancouver, B.C.

Railway Rolling Stock Notes.

The Eastern Car Co. has shipped 400 gondola cars for the French State Railways.

The Timiskaming and Northern Ontario Ry. Commission has ordered 6 cabooses from Preston Car & Coach Co.

The Canadian Locomotive Co. is quoting on a further supply of locomotives for the Russian Government. The contract for decapod locomotives which the company had has been completed and all shipments made.

The Grand Trunk Pacific Ry., which was intending placing an order for refrigerator cars, in order to cope with the large increase in the transportation of fish from the Pacific coast to Canadian and U. S. points, has decided not to proceed further in the matter at present, pending the result of proposed adverse legislation to the fish trade on the B. C. coast by the U. S. Government, to which reference has already been made.

Referring to the report mentioned in our last issue that Canadian Government Railways had ordered some second hand rolling stock from the Pullman Co., we are officially advised that the purchase was as follows: 19 sleeping cars, 10 tourist cars, 2 parlor cars, 1 dining car, 1 baggage car, and 1 first class car.

Canadian Government Railways, between May 29 and June 10 received the following additions to rolling stock: 1 steel sleeping car from National Steel Car Co.; 3 baggage cars from Preston Car & Coach Co.; 81 stock cars from Canadian Car & Foundry Co.; 4 consolidation locomotives from Canadian Locomotive Co., and 1 consolidation locomotive from Canadian Allis-Chalmers Ltd.

As mentioned in our last issue, Canadian Government Railways have ordered 500 steel frame box cars, 50 tons capacity, for the Intercolonial Ry., from the Eastern Car Co., and also 500 from the Canadian Car & Foundry Co. The under frames will be built up from structural and pressed shapes, with centre sills of 15 in. channels reinforced top and bottom by angles. The door openings will be 6 ft. wide, and the equipment will include twin spring draft gear, Simplex couplers 5 by 7 ins., inside roof, Simplex truck bolster, McCord journal boxes, and trucks of the arch bar type. The dimensions will be:

Inside length	40 ft. 6 ins.
Inside width	9 ft. 0 ins.
Inside height in clear	9 ft. 0 ins.
Trucks centre to centre	31 ft. 0 ins.
Height over running boards	14 ft. 0½ ins.

The French Government has ordered, for the Paris & Orleans Ry., 100 coal cars, 40 tons capacity, from the Eastern Car Co. They will be designed by the builders, and built up entirely of steel with six double vertical swinging doors on each side. The centre sills will be of 10 in.

ship channels, reinforced at bottom with angles and truss rods. The buffer and drawbar arrangement will be of the same type as at present used on the railway, and the truck will be of the arch bar type with bathtub bolsters. The hand brake will be arranged to be applied to one truck and operated from either side of the car, and the wheels will be of the open hearth steel kind with special axles and 5 by 9 in. journals, McCord journal boxes and M.C.B. bearings and wedges. The inside length of the car will be 37 ft., inside height 5 ft. 3½ in., trucks centre to centre 25 ft. 3 ins.

Dominion Government Grain Trade Enquiry.

As mentioned in our last issue, the Dominion Government has appointed a commission to investigate the handling and marketing of grain in Canada. The committee of the Privy Council recently had before it the representations of the Minister of Trade and Commerce, that he thinks it expedient that an inquiry should be made into and concerning the whole matter of the handling and marketing of grain in Canada, and in particular (1) the grading and weighing of grain; (2) the shipping of grain from country elevators; (3) grain exchanges; (4) the financing of grain; (5) the handling of grain at terminal points and in respect of the charges for the same; (6) the shipment of grain to Atlantic ports; (7) lake shipments; and recommends that Robert Magill, Chief Grain Commissioner; W. D. Staples, and J. F. Jones, Grain Commissioners, Fort William, Ont., be appointed commissioners pursuant to part 1 of the Inquiries Act, R.S.C., 1906, chap. 104, to conduct such inquiry; and that they be authorized to engage such accountants, engineers, technical advisers, or other experts, clerks, reporters, and assistants as they deem necessary, and also counsel to assist them, and to authorize any such assistants or any other qualified persons to inquire into any matter within the scope of such inquiry as they may direct; also that the commissioners be required to report to the Governor General in Council the result of their investigation, with the evidence taken, and any opinion they may see fit to express thereon. An order in council was passed subsequently authorizing the commission.

Quebec Transportation Club's Annual Meeting.

The annual meeting of the Quebec Transportation Club was held at Kent House, Montmorency Falls, June 6. After passing the report and discussing of several matters affecting the members in their business, officers for the current year were elected as follows: Hon. Presidents, H. G. Matthews, General Manager, Quebec Ry., Light, Heat and Power Co.; E. O. Grundy, General Freight and Passenger Agent, Quebec Central Ry.; W. M. Macpherson, Manager, White Star-Dominion Line; President, J. S. Thom, President, Quebec Forwarding Co.; First Vice President, J. H. Davidson, Superintendent, Canadian Northern Ry.; Second Vice President, A. F. Dion, Traffic Manager, Quebec Harbor Commission. The executive committee was elected as follows: G. J. P. Moore, C.P.R.; F. S. Stocking, Q.C.R.; J. T. Cassels, Q.R.L. & P. Co.; W. J. Thompson, Quebec and Lewis Ferry Co.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed the paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates of orders, immediately following the numbers, are those on which they were drawn.

24995. May 23.—Amending order 24965, May 10, re C.P.R. subway at Decary Ave., Montreal.

24996. May 25.—Ordering Canadian Northern Ry. to erect fences along its right of way east and west of Onoway, Alta.

24997. May 23.—Relieving G.T.R. from providing further protection at highway immediately west of Bronte station, Ont.

24998. May 23.—Extending to July 31, time within which C.P.R. shall install bell at highway at west of Welsford station, N.B.

24999. May 23.—Ordering Canadian Northern Ry. to stop train 25 on flag at Indi, Sask., and dismissing application to stop train 6.

25000. May 25.—Extending to July 1 time within which Canadian Northern Ry. shall build crossing at second concession road allowance over its right of way, Goulbourne Tp., Ont., required by order 24240, Sept. 28, 1915.

25001. May 26.—Authorizing C.P.R. to build spur for Western Canada Flour Co., Calgary, Alta.

25002. May 29.—Authorizing Lake Erie & Northern Ry. to open for traffic its line from Galt to Simcoe, Ont., 43.3 miles.

25003, 25004. May 29.—Authorizing Lake Erie & Northern Ry. to operate across G.T.R. and Toronto, Hamilton & Buffalo Ry. at Brantford, Ont., pending installation of interlocking plant, for three months from date, crossing to be protected by L. E. & N. R.

25005. May 27.—Authorizing G.T.R. to cross Third St., Cobourg, Ont., with three tracks, as shown on plan on file 26998.

25006. May 26.—Authorizing C.P.R. to build switching lead and spur for Canadian Explosives, Ltd., at Nobel, Ont.

25007. May 27.—Authorizing Canadian Northern Ry. to build bridge over Elbow River, Calgary, Alta.

25008. May 26.—Authorizing Canadian Northern Quebec Ry. to build three spurs for Quebec Abattoir Co., Quebec, Que.

25009. May 27.—Ordering C.P.R. within 60 days to install bell at highway first east of Mountain station, Ont., 20 per cent. to be paid out of railway grade crossing fund.

25010. May 27.—Ordering G.T.R. to build station at Rideau at location approved by order 19609 within one year, plans to be filed for Board's approval.

25011. May 29.—Amending order 24754, Feb. 23, re installation of bell by G.T.R. at crossing in Lot 25, Con. 2, Etobicoke Tp., Ont.

25012. May 27.—Ordering G.T.R. to install, by Aug. 31, gates at crossings of Waterloo and Colborne Sts., London, Ont., to be operated day and night; 60 per cent. of cost to be paid by G.T.R., 20 per cent. by City of London, and 20 per cent. out of railway grade crossing fund for each crossing; watchmen to be paid by G.T.R., and balance of maintenance, 70 per cent., by G.T.R., and 30 per cent. by city; protection at Ridout, Richmond, Burwell, William, Maitland, Adelaide, Rectory, Egerton and Clarence Sts., reserved.

25013. May 30.—Authorizing Hydro Electric Power Commission of Ontario for one year from date to maintain wires across Michigan Central Rd., wires and tracks at Main St., Niagara Falls.

25014. May 29.—Authorizing Canadian Northern Ontario Ry. to build spur for International Contractors, Ltd., mileage 170.5 from Toronto, Parry Sound District.

25015. May 29.—Authorizing C.N.R. to divert road allowance between Secs. 22 and 23-9-21, w. p.m., through n.w. ¼ Sec. 23, Man.

25016. May 29.—Authorizing G.T.R. to build siding for John Marks, Hamilton, Ont.

25017. May 27.—Authorizing C.P.R. to divert road allowance on west boundary Sec. 16-5-32, w.p.m., and build its Griffin Subdivision across same at mileage 48.5.

25018. May 30.—Ordering Canadian Northern Ry. to erect station building on old site at Charlesbourg West, Que., to be completed within 60 days after approval of plans, which are to be filed by C.N.R. within 15 days.

25019. May 27.—Authorizing Ange Gardien Municipality, Que., to make highway crossing over Quebec Ry., Light, Heat & Power Co.'s track at Boischatel, Que.

25020, 25021. May 31, 30.—Extending to Aug. 1 time within which G.T.R. shall install bell at Ontario St., Burlington, Ont., and to Aug. 6 time within which it shall install bell at Talbot Road, just east of Courtland station, Ont.

25022. June 2.—Authorizing Sudbury-Copper Cliff Suburban Electric Ry. Co., pending completion of half-interlocking plant, to operate over C. P.R. at Elm St., Sudbury, cars to be flagged across by watchman, appointed by C.P.R. and paid by S.C.C.S.E.R.

25023. May 30.—Extending to Aug. 1 time within which G.T.R. shall install bell at Chatham Road, Thamesville, Ont.

25024. May 31.—Authorizing New York Central Rd. to rebuild bridge 26-A, near Cambridge, Ont.

25025. May 31.—Approving G.T.R. Form Revised 0-33, being special contract and power of attorney and release to be signed by persons who desire for special reasons to travel on cars which are not intended to carry passengers.

25026. May 31.—Approving C.P.R. revised location from mileage 10.82 to 32.81, Coronation to Chaton, Swift Current Northwesterly Branch.

25027. May 30.—Authorizing C.P.R. to build spur at mileage 119.54, Montreal and Ottawa Subdivision, on Lemieux Island, Ottawa River, Ottawa, Ont.

25028. May 30.—Authorizing British Columbia Public Works Department to make highway over G.T.P.Ry. at Raush Valley, mileage 1120, Winnipeg West.

25029. June 5.—Extending to Aug. 1 time within which G.T.R. shall install bell at highway near Allanburg station, Ont.

25030. June 5.—Authorizing C.P.R. to build spur for Conger Lehigh Coal Co., Toronto.

25031. June 5.—Authorizing British Columbia Public Works Department to make highway over Grand Trunk Pacific Ry. at Carnaby.

25032. June 5.—Authorizing G.T.R. to build extension to siding for Lord & Burnham Co. on part Lot 14, Con. 6, Grantham Tp., Ont.

25033. June 5.—Authorizing Toronto, Hamilton & Buffalo Rd. to build spur for Mercury Mills, Ltd., Hamilton, Ont.

25034. June 5.—Ordering Canadian Northern Ry. to fence right of way, on both sides, mileage 6.29 to 12, west of Tollerton, Alta., and on north side, mileage 12 to 17, to be completed by July 15.

25035. June 5.—Authorizing G.T.R. to operate over Gunns Ltd. siding, north of St. Clair Ave., and west of Gunns Road, Toronto.

25036. June 5.—Extending to Aug. 1 time within which G.T.R. shall install bell at crossing of road between Concessions A and B, Etobicoke Tp., Ont.

25037. June 5.—Authorizing Town of Drummondville, Que., to make highway over C.P.R. at St. Jean St.

25038. June 8.—Authorizing Canadian Northern to rebuild trestle at Snake Creek Crossing, mileage 151.5, Dauphin Subdivision, Man.

25039. June 8.—Authorizing Northern Ontario Ry. to use bridge over Magnetawan River, mileage 188.1 from Toronto, in Wallbridge Tp.

25040. June 8.—Authorizing Canadian Northern Ontario Ry. to divert road between Harcourt and Cardiff Tps.

25041. June 7.—Ordering C.P.R. to remove ridge at crossing at Con. 7, East Flamboro Tp., Ont., to give clear view 75 ft. from track.

25042. June 9.—Approving location of C.P.R. station at mileage 21.1, Brantford, Ont.

25043. June 9.—Relieving C.P.R. from providing further protection at Russel Road crossing, Gloucester Tp., Ont.

25044. June 9.—Ordering Canadian Northern Ry., within two weeks, to rebuild fence on Elgin Babcock's property, in Lot 5, Con. 4, Portland Tp., Ont., according to standard required by Railway Act.

25045. June 9.—Authorizing Three Rivers Traction Co. to operate cars for three months over crossing of C.P.R. loop line at St. Maurice St., Three Rivers, Que., applicant's conductors to flag cars over crossing.

25046. June 9.—Authorizing Canadian Northern Ry. to build bridge across Ochre River, mileage 164.26, Manitoba, and rescinding order 22090, June 27, 1914.

25047. June 9.—Approving location of Canadian Northern Ry. station in Sec. 5-36-9 W. 2 M., Sask., mileage 101.

25048. June 9.—Authorizing Michigan Central Rd. to build spur or Page Hersey Iron Tube & Lead Co., Welland, Ont., and approving overhead clearance under crane runway.

25049. June 12.—Authorizing British Columbia Government to make highway over Esquimalt & Nanaimo Ry. at Malahat, mileage 20.2, from Victoria.

25050. June 10.—Ordering G.T.R. to interswitch cars from London & Port Stanley Ry. to G.T.R. team tracks, under agreement of Apr. 25, 1870, between Great Western Ry. of Canada and London & Port Stanley Ry.; to become effective by July 10th.

25051. June 10.—Relieving G.T.R. from providing further protection at first crossing west of Summertown station, Ont.

25052. June 12.—Ordering G.T.R. to build farm crossing between Cons. 2 and 3, Bertie Tp.

25053. June 13.—Ordering C.P.R. to widen bridge at London St., Windsor, Ont., to 56 ft.; 65 per cent. of cost to be paid by C.P.R. and 35 per cent. by the city, or Sandwich, Windsor & Amherstburg Ry., as may be determined by Board.

25054. June 12.—Ordering C.P.R. to appoint station agent at Torquay, Sask., by June 30.

25055 to 25061. June 12.—Approving Bell Telephone agreements with 7 telephone companies and municipalities.

25062. June 13.—Amending order 24991, May 18, re Canadian Northern Ry. station at Carmel, Sask.

25063. June 13.—Ordering Canadian Northern Ry. to build roads to its station at Menzie, Man., by July 15.

25064. June 14.—Approving plans D. 100-16 and D. 100-17, showing details of Canadian Northern Ry. standard reinforced concrete slabs for structures.

25065. June 14.—Authorizing Great Western Mines Development Co. to build bridge over C.P.R. three miles east of Field, B.C.

25066. June 15.—Rescinding orders 12829 and 21375, June 26, 1911, and Feb. 17, 1914, respectively, re transportation of mining students from Montreal to British Columbia.

25067. June 15.—Authorizing C.P.R. to build diversion in lieu of Government trail in n.e.¼ Sec. 1-39-12, w.4.m., Alta.; and to build its Swift Current North Westerly Branch at mileage 18.28 across same at grade.

25068. June 15.—Approving of Brandon, Saskatchewan & Hudson Bay Ry. bylaw 10, June 2.

25069. June 14.—Ordering C.P.R. to lay cinder platform at Mud Lake Crossing, Ont.; trains 37 and 38 to stop there on flag for three months from July 1, record to be kept of travel and report made at end of three months, during this period; flag stops made by trains 37 and 38 at Bolingbroke may be discontinued.

25070. June 15.—Permitting Maine Central Rd. to operate locomotives used in international traffic and merely passing through Canadian territory, equipped with clear vision window in cab of locomotives; permission not to extend to locomotives operated from or entirely within Canadian territory.

25071. June 12.—Authorizing Winnipeg Electric Ry. to operate over C.P.R. crossing on Talbot St.; staying operation of conditions 1, 2, 3 and 4 of order 18260, Dec. 9, 1912, and authorizing C.P.R. to operate over said crossing, cars to come to stop and be flagged over.

25072. June 15.—Approving C.P.R. plan 51850, July 31, 1914, showing subway at Spadina Road, North Toronto grade separation.

25073. June 16.—Authorizing C.P.R. to build diversion in lieu of Government trail, in s.e.¼ Sec. 10-39-12, w.4.m., Alta., and build its Swift Current Northwesterly Branch across same.

25074. June 9.—Ordering that, independently of general interswitching order, and pending adjustment of entire switching question, now before Board, the C.P.R. toll for switching live stock from its connection with C.N.R. to East End cattle market in Montreal, be \$5 a car, and ordering C.P.R. to accept such traffic from C.N.R. and perform necessary switching service over its line to East End cattle market at toll herein provided.

25075. June. Ordering Canadian Northern Ry. to move siding at Lilac, Sask.

25076. June 14.—Ordering Grand Trunk Pacific Branch Lines Co. to build transfer and storage track with C.N.R. at Battleford, Sask., C.N.R. to pay one-fifth of cost of building and half maintenance.

2507. June 17.—Authorizing C.P.R. to build its Gleichen Subdivision across road allowance on east boundary of Sec. 23-22-25, w.4.m. at mileage 12.70.

25078. June 16.—Approving Nelson & Fort Sheppard Ry. bylaw of May 16.

General order 166. May 29.—Extending to July 1, 1917, time within which railway companies, subject to Board's jurisdiction, make changes required under general order 128, July 20, 1914, prescribing rules and regulations respecting safety appliances on trains.

C.P.R. Centre, St. John's Ambulance Association.

The report for last year shows that 1816 persons passed qualifying examinations, out of 2564 who took instruction at the classes. Of wives and daughters of C.P.R. employees 825 have received certificates of qualification. Instruction was given the Borden Battery and Ammunition Column before it left Montreal for overseas. W. T. Davies, C.P.R. ambulance instructor, and Wm. Newcombe, C.P.R. constable, saved three men from drowning at Winnipeg. Particulars were given of administering of first aid in 3,780 cases by members of the C.P.R. Centre, the cases being divided as follows: Atlantic Division 9, Eastern Division 130, Ontario Division 136, Western Lines, 3,440. The report paid a strong tribute to the late Lacey R. Johnson, who was chairman of the C.P.R. Centre and also of the whole Association. While he was chairman nearly 7,000 C.P.R. employees passed qualifying examinations.

Electric Railway Department

Car Operation on Bridge Approaches in Winnipeg.

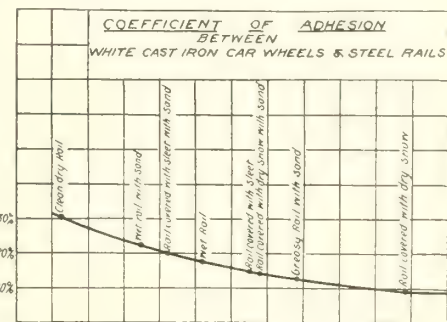
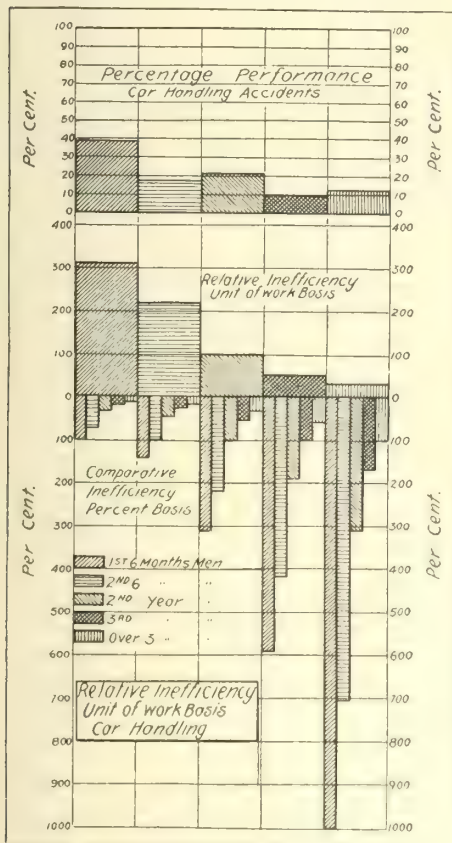
An interesting situation has developed in connection with an order of the Manitoba Public Utilities Commission that the Winnipeg Electric Ry. should operate cars over the Arlington St. overhead bridge which crosses the C.P.R. tracks, at what is said to be the largest individual railway yards in the world. The company's management always contended that the bridge approaches were too steep to operate over and maintained that the company would not be responsible for accidents if forced to operate over it. The commission at first refused an order when requested by the city to force the company to operate over the bridge, but after considerable pressure had been brought to bear, and after a number of engineers had reported on the bridge, grade, tracks, etc., suggesting changes, an order was issued for the company to operate with special equipment, sanders,

account of dry snow on top of the rails. The car used was of the double truck, double end type, 40 ft. 1 in. long over all, and equipped with four GE-67A motors, with gear ratio of 16:67. The car weighed approximately 41,100 lb. but as loaded for the test, weighed about 50,600 lb. Five one-way trips across the bridge were made, during which different combinations of motor braking, air braking and hand braking were attempted. The car was brought to rest during the ascent on a number of occasions, and started up again without any difficulty. The car was brought to rest and allowed to run backwards till a speed of approximately 2 m.p.h. was attained. It was then stopped with the aid of the motors, and started forward again. On the descent, with a headway of approximately 2½ m.p.h., the air brakes alone could control the car, without sand. At higher speed sand had to be used, and above 4 m.p.h., under the conditions existing, the car could not be stopped readily, even with sand, by means of the air brakes alone. The motors had to be resorted to to bring the car to rest.

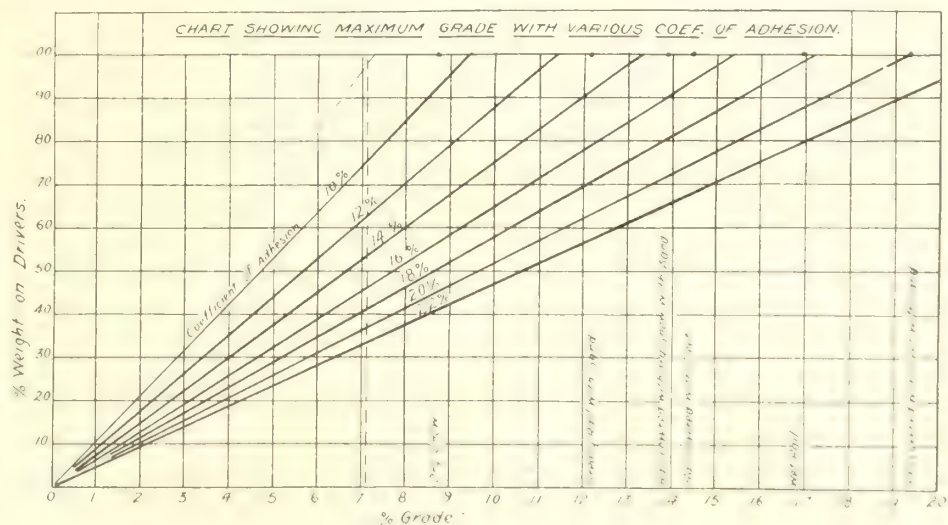
As to failure of equipment from freezing up of the air equipment, Mr. Guy estimated that under ordinary conditions the chance of a car going out of service from this cause was about 1 in 13,000, while the chances for freezing on the approaches would be about one-sixth of this ratio or 1 in 78,000. Mr. Guy believed, however, that the efficiency of the

have left the service for the front." It is Mr. Guy's opinion that some form of brake, such as grips the rail or pavement, might be used on the cars which operate on the bridge, which would prevent a car from running away in case it started to slide. This would prevent, to a very large extent, any serious accident, and make operation over the bridge comparatively as safe as on the level.

"Following is the result of a mathematical analysis of the operation of cars on the grades under very bad rail conditions," says the report, "and under one difficulty which is apt to arise frequently, that is when it will be necessary to stop on the descent to prevent collisions, or



for other reasons. These problems have been worked out for various other conditions which may arise, and the results show that the operation is practicable.



etc. The company proceeded to carry out the order, and the city made changes to the bridge and tracks. The union of motormen and conductors, however, refused to handle the cars over the structure, on the ground that both the company and the city had refused to accept responsibility for accidents. As a result a test trip was made over the bridge by G. L. Guy, the commission's engineer, representatives of the company, union and commission being present. As the result of the report of Mr. Guy, based on this test, the commission ordered that operation over the bridge be suspended to allow further consideration of the conditions.

On the day the test was made the temperature was 21.4 deg. F. below zero, while operating conditions were bad on

motormen in charge of the cars is a more important factor in safe operation than either the grades or the equipment. He accompanied his report with a chart, showing the relative efficiency, as far as car operation is concerned, of car operations of various lengths of service. This chart is made up from actual statistics of accidents during 1914. "It is apparent," the report states, "that accidents are about 10 times more frequent, considering the time worked, with new motormen than with old experienced men. As new men are almost sure to be on this run, there is much more likelihood of accidents from this cause. Another fact which will affect the chance of accidents in the immediate future is that since Aug. 1, 1914, some 270 old operators

These results, I contend, are borne out under actual tests. The success of it depends on the efficiency of the car operator:

Engineering Computation.

Actual weight of car loaded. 50,600 lb.
Weight normal to incline on
7.1% grade—50,600 Cos O... 50,446.7 lb.
Force down and parallel to
grade due to weight of
loaded car—50,600 Sin O... 3,592.6 lb.
W—Total weight of car in tons.
p—Coefficient of adhesion (bad rail)
10%
r—Train resistance in pounds per ton
of total weight.
G—Per cent grade (7.1%).
a—Acceleration in miles per hour.
Maximum traction effort that can be

exerted without slipping under bad rail conditions— $20p \times W \times 1 - (G 100)^2 = 5034.7$ lb.

This also represents the maximum retarding effort of the brakes before the wheels will slip on the incline with bad rail conditions.

Power required to overcome grade is 20 lb. per ton for each per cent grade—550 lb.

Allowable braking effort to reduce speed—1185 lb.

Pounds per ton of car—59.4 lb.

Maximum negative acceleration—0.91 ft. per sec.

Taking an average condition of requiring to stop the car in 30 ft.—time required to bring car to rest 8.027 sec.

Maximum initial speed allowable to stop car is 30 ft. with bad rail conditions—7.30457 ft. per sec. corresponding to 4.98 m.p.h.

"The calculation takes it as possible to throw the brakes on instantly and set them at the exact pressure, such that any increase would cause the wheels to slip on the rails. This hypothesis, of course, is impossible, but a competent motorman can adjust brakes in $2\frac{1}{2}$ sec. within 25% of the maximum braking effort. From the above, to keep a car under control in bad weather the speed on the grade should not exceed 3 m.p.h.

"Charts herewith show the coefficient of adhesion between car wheels and rails under various conditions of rail. These results are plotted from experimental data. There is also a chart showing the maximum grade that can be ascended under various conditions of track, providing there is sufficient motor capacity. As in the operation of Arlington St. bridge no trailers will be used, there will be 100% of the car's weight on the drivers. Hence where the 100% ordinate is cut by the coefficient of adhesion curve, the abscissa represents the maximum grade mountable. For example, the coefficient of adhesion being .14, the maximum grade a motor car with all weight on drivers could ascend would be 13.3%. Conversely, with a grade of 7.1% the coefficient of adhesion would have to drop below .08, a condition which is not met in practice."

Toronto Railway Co's Rights on Yonge Street.

The Judicial Committee of the Privy Council, sitting in London, Eng., May 26, heard arguments regarding the Toronto Railway Co's right to lay tracks and operate cars upon the portion of Yonge St. within the city limits, lying between the C.P.R. tracks and Farnham Avenue.

Mr. Clausen, for the City of Toronto in supporting the appeal, said the agreement was made in 1891 between the city and the railway and validated by the Ontario statute to grant to the company the right to operate a surface street railway in the city for 30 years. His contention was that the agreement did not give the right now claimed by the company, because no franchise could be granted for more than 20 years, and no franchise to come into operation in future (in this case more than 24 years after the date of the agreement) could be granted at all.

The Metropolitan Ry., in 1891, had a franchise from the County of York over that part of Yonge St., including a piece running from the present C.P.R. tracks to Farnham Ave., and a short time before the agreement the city had acquired this piece of land. The Toronto & Mimico

Electric Ry. had, before the enactment of the validating agreement, obtained a franchise over the portion of Queen St. west of Dufferin St., but the franchise ran out in June, 1915. The Toronto Ry. insisted, however, that it still had a right to run its undertaking over the part of Yonge St. referred to.

The Lord Chancellor said: "The question is whether, on the construction of the agreement by which, by clause 2, the appellants purported to grant the right to respondents to operate tracks along the streets of the city within certain limits, excepting the part of Yonge St. which had been taken over by the Ontario & Quebec Ry., now the C.P.R., and so forth, 'so far as the corporation can legally grant same,' was a grant which passed to respondents, the right to which, in the Canadian courts, they were held to get under the agreement."

Mr. Clausen replied affirmatively, adding that the appellants only granted to the respondents such rights over that portion of Yonge St. in dispute as they had at the date of the agreement power to grant.

Sir John Simon, for the Toronto Ry., submitted that the effect of the agreement was that the city had given the company whatever rights the city had over the street in question; those rights were for a term of 30 years from 1891. His learned friend had shown no ground which entitled the appellants to impose restrictions on the company in the proposed operations on Yonge St. The agreement gave the company the exclusive right to operate such railways for 20 years, and went on to provide that the right should be renewed for a further 10 years in the event of legislation being obtained to enable this to be done. With this object, the appellants' predecessors pleaded that they and their successors would aid in procuring the needed legislation to authorize such renewal if that alone was insufficient to entitle the Ontario Railway and Municipal Board to decide the dispute in favor of his clients. All doubts were set at rest by validating the act which incorporated the company and confirmed the agreement, and declared that under the agreement the respondents had acquired and were entitled to the exclusive right and privilege of using and working the street railways in the city for 30 years, except so far as they overlapped the right already granted to the Metropolitan St. Ry. on that portion of Yonge St. as existed at the passing of the act. The judgment of the court now under appeal, he submitted, gave the correct interpretation to the language of the agreement. The question was not a new one. It had been argued in the Toronto Ry. vs. the City of Toronto as long ago as 1906, and incidentally in other cases decided since then. In these cases the principle decided supported the contention of the respondents in the present case.

The Lord Chancellor said he would consider their opinion, and judgment was reserved.

Judgment was delivered June 23, in favor of the Toronto Ry. with costs. This confirms the original order granting the company permission to extend its tracks on Yonge St., north of the C.P.R. for 1,320 ft. to Farnham Ave.

James Lightbody, who was formerly on the staff of the Daily Province, Vancouver, has been appointed Publicity Agent, British Columbia Electric Ry., vice B. I. Dasent, who has left the company's service.

Brantford Municipal Ry. Wages, Etc.

In consequence of a dispute between the Brantford Municipal Railway Commission and its conductors and motormen, the men having demanded an increase of wages, that motormen be provided with seats on cars, and that there be a written agreement between the Commission and the men, a board of conciliation and investigation was appointed under the Industrial Disputes Investigation Act, 1907, F. W. Frank, of Brantford, representing the Commission, Jos. Gibbons, of Toronto, representing the employees, and Judge Snider, of Hamilton, being chairman. The Board reported on June 2 that, after repeated efforts a settlement between the parties was arrived at, and that a memorandum embodying the same had been signed by the chairman of the Commission and by the employees' representative before the Board, who is also the President of Division 685, Amalgamated Association of Street & Electric Railway Employees. Under the agreement a new schedule of wages was put into effect to date from June 1, 1916, and to remain in effect until June, 1917. Following is a comparison of the old and new rates per hour:

	Old rate.	New rate.
1st month	15c.	16c.
Following 11 months	17½c.	19½c.
2nd year	19c.	21½c.
3rd year	20c.	22½c.

Stools are to be provided for motormen in defined limits; rigid inspection of cars to be constantly made; change to be carried by conductors is to be amply provided by the Commission; boxes for coats and caps provided in each car to be used by motormen and conductors; open cars are to be improved as to storm conditions; charges against employees are to be always open to appeal to the Commission; half cost of uniforms is to be paid by the Commission; seniority as to duties of employees is to be left to the management; all rights and privileges enjoyed by employees on June 1 are to be continued; no discrimination is to be made against any employee on account of his belonging to a labor union. The terms of settlement are to be placed on the Commission's minute book.

Regina Municipal Railway Earnings, Etc.

Following are statistics for April, compared with those for April, 1915, and the total for four months ended Apr. 30:—

	Apr. 1916	Apr. 1915	Jan. 1 to Apr. 30, 1916
Total revenue	\$18,121.67	\$12,946.92	\$72,384.39
Expenses	15,241.47	14,255.67	70,290.30
Capital charges ..	8,963.80	9,137.58	35,855.20
Operating surplus ..	2,880.20	x1,298.75	2,094.09
Deficit	6,083.60	10,436.33	33,761.11
Expenses per car mile without power	15.01c.	13.63c.	18.01c.
Expenses per car mile with power	20.11c.	18.03c.	24.15c.
Platform wages per car hour	72.94c.	73.06c.	73.71c.
Passengers carried ..	410,697	277,330	1,609,117
Expenses less capital charges, percentage	84.10		
Expenses with capital charges, percentage	137.57		

Fare Changes on Kingston, Portsmouth and Catarqui Electric Ry.—On June 1 the company discontinued selling 6 tickets for 25 and instituted a cash fare of 5c. Workmen's tickets, good from 6.30 to 7.59 a.m., and from 5 to 6.30 p.m., are sold at 8 for 25c, and tickets for children between the ages of 5 and 12 are also sold at 8 for 25c.

Electric Railway Projects, Construction, Betterments Etc.

Calgary Municipal Ry.—We are officially advised that an additional half mile of track has been built to the military camp at the Sarcee Indian Reserve, for army freight and supplies, and an additional half mile of sidings to the main track. The main line to the camp, which connects with the city system at Killarney St. was opened for passenger service at the end of May. The extension mentioned above is for freight purposes only, and did not necessitate very much grading. (June, pg. 242.)

Hamilton St. Ry.—The Hamilton, Ont., City Council has been advised by its Street Railway Committee that the company is prepared to lay tracks on Kenilworth Ave., from Barton to Burlington St., and that it was expected to start work by the end of June. (April, 1915, pg. 147.)

Lake Erie & Northern Ry.—The first car over the extension of this line from Brantford to Simcoe, 23.5 miles, was run May 29, and the regular service was started May 30. The cars run right through from Galt to Simcoe, 43 miles, a car running in each direction every two hours. The eight-mile extension from Simcoe to Port Dover is expected to be opened for traffic about the middle of July. The erection of the overhead work on this section is being proceeded with.

The station at Simcoe is a commodious building, containing a large waiting room, ticket office, baggage room and their necessary conveniences.

It was stated in our last issue that the Brantford City Council had approved of the plans for the station to be built in Brantford for the Lake Erie & Northern and the Hamilton & Brantford Railways, with the stipulation that the L.E. & N. buy a strip of land opposite the station site in order to widen Water St., and to deed it to the city for highway purposes, the city offering to give in exchange a small piece of land to the west of the triangular portion of Water St., which will also be used by the railways. The L.E. & N.R. objected to this and went to the Board of Railway Commissioners, which decided, June 9, in favor of the city's contention. As the railway clearance under the bridge is 18 ft. and the station clearance 17 ft., and as the line is electrically operated, and it will not be necessary to have men on the top of the cars, the order provides for the clearance required of 17 ft. on the company giving the usual undertaking that men will not be allowed on the top of cars. We are officially advised that the building of the station is being proceeded with. (June, pg. 240.)

London & Port Stanley Ry.—Work on the new station building in London was reported to be well advanced June 14. It is reported that the building is being erected without a permit from the city council, and having been refused on the ground that the building is described as "shed construction," which is not permitted in first class fire limits embracing the site of the station.

Moncton Tramways, Electricity & Gas Co.—We are officially advised that the company will probably remove its track between Weldon St. and High St., on Main St., and between Main and Park St., on High St., and place the same on Weldon St. from Main to Park St., thence on Park St. to High St., about half a mile.

It is also proposed to pave about 3,000 ft. of track on Main St. with bitulithic at once. The Sunny Brae, N.B., Town Council has appointed a special committee to meet the company, and discuss the question of the extension of the electric railway from Moncton to Sunny Brae. (Feb., pg. 73.)

Montreal Tramways Co.—A petition has been extensively signed by the residents of the Park Ave. extension district, asking that they may be given a car service by the extension of the Van Horne Ave. line for 350 yards to Atlantic Ave. (June, pg. 242.)

Pictou County Electric Co.—The Nova Scotia Legislature has extended the time within which the company may build the various electric lines which its predecessor in title, the Egerton Tramway Co., was authorized to build in 1902, and which have not been built. (Dec., 1915, pg. 482.)

Quebec Ry., Light & Power Co.—We are officially advised that the management knows nothing of the building of a new piece of railway at a cost of \$100,000, which a United States press report stated recently the company had decided on undertaking. The question of the extension of the company's lines in Belvedere Ward is urged by the City Council. The company offered to accept the decision of the Quebec Public Utilities Commission as to the necessity for the extensions asked for, and the city will make the necessary application. (Dec., 1915, pg. 482.)

Regina Municipal Ry.—An extension of track to the Imperial Oil Co.'s headquarters, Winnipeg St., Regina, Sask., has been completed. (July, 1915, pg. 277.)

Sandwich, Windsor & Amherstburg Ry.—Negotiations are in progress between the city and the company for the construction of a second track on London St. West, before the new pavement is laid. There is some difference of opinion between the city and the company as to terms, but it is expected that these will be adjusted so that the work may be proceeded with this season.

We are officially advised that the present single track line between the Michigan Central Rd. bridge and Bridge Ave., on London St., Windsor, Ont., approximately 0.416 of a mile, will be double tracked at an early date. (Nov., 1915, pg. 441.)

Toronto Suburban Ry.—In reference to the proposal to change the gauge of a portion of the line, we are officially advised that the gauge of the lines being operated is 4 ft. 10 $\frac{3}{4}$ in., while that of the extension from Lambton to Guelph, is 4 ft. 8 $\frac{1}{2}$ in. The lines now operative are the ones to Lambton, along Keele St., to Weston and Woodbridge, and the Davenport road line. As it is intended to handle freight over the Lambton-Guelph line, it was necessary that it should be built standing gauge, and as the passenger cars on that line have to operate over both interurban and city lines, the gauge of all should be the same. The gauge of the Toronto Ry. and of the Toronto Civic Ry. is 4 ft. 11 $\frac{1}{4}$ in. (May, pg. 195 and 196.)

Toronto Civic Ry.—We are officially advised that construction is almost completed, upon the Lansdowne Ave. extension, from St. Clair Ave. to the C.P.R., 0.615 of a mile of double track. We are advised by the Commissioner of Works

for Toronto, relative to the new eastern entrance to the Exhibition Park, and the electric railway track there, that it is a continuation from the Toronto Ry. tracks from the corner of Bathurst and Front Sts. to the terminal in the exhibition grounds, just east of the Midway. The total length of the line is approximately 10,900 ft. of single track, and it is for the most part double track construction, with 60 lb A.S.C.E. rails on cedar ties and gravel ballast. The overhead construction is span work, and 2/0 round trolley wire will be used. The line is being built by the city, and will be operated by the Toronto Ry. Orders have been placed for material for track and overhead work. It is expected that this new eastern entrance will be completed by the end of August. (June, p. 242.)

Windsor, Essex & Lake Shore Rapid Ry.—In connection with the City of Windsor's proposal to pave Howard Ave. from the cemetery to Tecumseh Road, the question of the location of the company's tracks came up at the council meeting June 9. The company's tracks are on the boulevard, south of the cemetery, where they were located at the city's request, the city paying \$1,800 to move them there. The matter was referred back to the committee in charge with a request to confer with the company as to moving the tracks to the middle of the road.

The company has been granted permission by the city to pave the road on the west side of its car barn in Windsor. (Mar., pg. 115.)

Winnipeg Electric Ry.—We were officially advised May 26 that negotiations were under way for building a second track on the Winnipeg, Selkirk & Lake Winnipeg Ry., from the north city limits of Winnipeg to Kildonan Park, about a mile. These negotiations were not then completed, and the management was not in a position to state whether the work would be gone on with this year or not. The discussions about this matter, show that the undertaking of the work depends largely upon whether the city of Winnipeg will persist in its application to the company to lay a new line on Talbot Ave. (June, pg. 242.)

The Quebec Ry., Light & Power Co.'s lines after the transfer to the Dominion Government of the line from Quebec to St. Joachim, will consist of the City Division, 19.77 miles, and the Quebec County Division 4.82 miles. The latter line runs from Maple Ave. to Sillery, on the road to the Quebec Bridge. What is known as the Beaufort line is owned by the Beaufort Insane Asylum authorities, and it is and will continue to be operated by them. Whether the company will continue to operate the upper level line to Montmorency Falls has not been decided. (June, pg. 227.)

Safety First at Winnipeg.—For three or four days prior to the closing of the public schools in Winnipeg, R. R. Knox, Traffic Superintendent; H. Long, Electrical Superintendent, and L. Palk, Assistant to the Manager, Winnipeg Electric Ry., attended at the various schools in the district, and gave addresses to the scholars on safety first in relation to traffic on the streets. A quantity of literature was also distributed, in which hints are given to the children, all couched in such language as will be readily understood even by the smaller ones.

J. W. Lyon, President, Ontario Hydro Electric Radial Railway Association, was slightly injured by being struck by a street car in Toronto, June 8.

Safety Provisions on Niagara Falls Park and River Railway.

Following on the serious accident which occurred near Queenston Heights, on the N.E.P. & R. Ry. on July 7, 1915, the Ontario Railway and Municipal Board had its engineers, H. W. Middlemist and J. C. Royce, of Toronto, make a very thorough examination of the whole line, in which they were aided by the company's officials. As a result of the engineers' report, and of conferences between the Board and the company's management, the Board passed an order May 26 requiring the company to do as follows:

That the tracks from the upper arch bridge to the Grand Trunk bridge be ballasted with stone or gravel ballast in a good and sufficient manner under and between the ties and to the tops of the same, to be approved by the Board's engineer; and that all clay and mud be removed from the ballast to the satisfaction of the Board's engineer. That where necessary in the judgment of the Board's engineer suitable drains or ditches be placed in the tracks from the upper arch bridge to the Grand Trunk bridge, with cross drains adequate to carry the water to the edge of the cliff at the lowest points; such work to be done to the satisfaction of the Board's engineer. That immediate temporary or partial repairs be made as in the two preceding sentences mentioned ready for inspection by the Board's engineer not later than June 15, 1916, and that the matter of further permanent repair be reserved for consideration by the Board on said date. That adequate provision be made for the proper drainage of the tracks at all places where the track is low, from the Grand Trunk bridge northerly to the river dock at Queenston; this work to be done ready for inspection by the Board's engineer during 1916. That all ties in the tracks which are defective or unfit for use owing to decay shall be removed at once, and sound, serviceable ties substituted therefor; and so from time to time hereafter. That suitable stone or gravel ballast be put in at all low spots along the line where water is likely to accumulate, and that where low joints are found in the tracks these should be raised and ballasted and the ballast tamped under the ties. That where any spikes are missing in the ties they shall be replaced. That all outer rails which are in a worn condition and which are situated on a curve, be renewed. That all guard rails be carefully inspected and where necessary securely spiked to the ties, and that existing guard rails be added to and extended as required from time to time by the Board's engineer.

That the safety switch near Brock's monument be reconstructed according to the plan approved by the Board.

That all weeds and vegetable growths be forthwith removed from between the rails and for a distance of 18 in. outside the tracks and also (except upon the section of the railway within the Queen Victoria Niagara Falls Park) from the devil strip between the tracks: and that the said areas, except as above excepted, be hereafter maintained free from weeds and vegetable growths. That those portions of the cliff at which the track approaches close to the edge, and which under instructions from the Board were examined by officials of the company and reported upon, be hereafter, not later than the first week in May in each year,

carefully examined by officials of the company, and reported upon in writing to the Board as to the condition and safety of the same. That all culverts under the tracks be rebuilt of concrete or cast iron pipe of suitable diameter in a good and substantial manner during 1916.

That the railway from Queen St., Queenston, to the river dock be reconstructed with a safety switch and with altered grades and curves, in accordance with the plan approved by the Board.

Where the trolley wire is carried on span wires, the trolley poles supporting the span wires shall be erected and maintained at a minimum distance of 7 ft. from the centre line of the nearest track, such distance to be measured to the face of the trolley pole nearest the track; provided that where this is impracticable, owing to the proximity of the railway to the cliff, the Board may permit a trolley pole or poles to be erected nearer the centre line of the nearest track.

That in operating the cars rule 18 of the rules for the government of conductors and motormen shall be strictly observed. That hereafter all cars operated to Queenston dock shall have double motor equipment. That the brake rods and brake equipment of the cars operated shall be strengthened as specified in drawing filed with the Board. That all cars operated on this line shall be equipped with suitable fenders of a type approved by the Board. That sanders of ample capacity, as approved by the Board, shall be fitted to the cars and adjusted to deposit the sand as close to the wheel as possible, and that the sanding adjustment be frequently inspected so as to ensure that it is in good working order. When operating up or down the Queenston grade and if loaded to the full extent of its seating capacity, the number of permissible standing passengers, in excess of such loading, shall be limited as follows,—an open car shall not be loaded beyond 10% of its seating capacity, and a closed car shall not be loaded beyond 30% of its seating capacity.

That the company's rule 133, limiting the speed of cars over switches and curves and square crossings, be strictly observed. That this order shall take effect forthwith and all its requirements shall be satisfied in a manner to be approved by the Board's engineer.

The International Ry. Co.'s management has favored Canadian Railway and Marine World with plans showing the change in track leading to Queenston dock, and the installation of the so-called safety switch on the same piece of track, in connection with which it may be mentioned that the gradient has also been reduced approximately 1% incident to these changes. In regard to the various paragraphs of the Board's order, it is stated that the ballasting of the tracks from the upper arch bridge to the G.T.R. bridge has been completed, and that the necessary drains are being installed. New ties are being put in wherever defective ones appear. This is done regularly each year in carrying on ordinary maintenance work, there being about 10% of renewals yearly. Stone or gravel ballast has been put in all low spots, and where there are low joints they have been raised and ballasted and the ballast tamped under the ties. Where any spikes are missing in the ties they are being replaced. Naturally this work is done

as part of the ordinary maintenance. The same remark applies to the inspection of guard rails and the spiking of them to the ties. Other points where guard rails are desired have been indicated by the Board's engineers, and they will be installed. The desired changes have been made in the safety switch near Brock's monument. The new switch provides an easier approach to the derail.

Mainly About Electric Railway People.

F. W. Brooks, heretofore General Manager Detroit United Ry., has also been elected President, in succession to J. C. Hutchins, elected Chairman of the Board.

Mrs. W. C. Hawkins, wife of the Vice President and Managing Director, Dominion Power & Transmission Co., has been elected President of the Hamilton, Ont., Associated Field Comforts Committee.

Percy Lewis has been appointed Purchasing Agent, British Columbia Electric Railway, vice C. A. Lee, appointed Assistant Engineer in the Electric Engineering Department.

E. Kidd, General Manager British Columbia Electric Ry., left Vancouver, June 9, for London, Eng., for his annual conference with the directors. He expects to return early in August.

Lieut. Col. G. C. Royce, Secretary-Treasurer and General Manager, Toronto Suburban Ry., who for some time has been in command at the alien internment camp at Kapuskasing, Ont., is to raise an overseas battalion in Toronto in connection with Queen's Own Rifles.

R. M. Dunlop, heretofore chief clerk, Freight Office, G.T.R., Chatham, Ont., has been appointed agent, Chatham, Wallaceburg & Lake Erie Ry., there. The position of General Freight Agent, heretofore held by D. L. Welch, who has gone to the London & Port Stanley Ry., has been abolished.

D. L. Welch, heretofore General Freight Agent, Chatham, Wallaceburg & Lake Erie Ry., Chatham, Ont., has been appointed accountant, London & Port Stanley Ry., London, Ont. The report mentioned in our last issue stated that his title would be travelling auditor. Some biographical particulars were given in our June issue.

London, Eng., cablegram May 2:—"The news that Major Norman C. Pilcher of the Canadian Mounted Rifles was killed in action was received with special regret in Liverpool, where his family was well known, his father being a captain. Edward Pilcher, his grandfather, twice refused the Mayoralty of Liverpool. Major Pilcher was several times personally congratulated by General Seely for courage and resource under heavy fire. He served in the Boer war."

Major N. C. Pilcher, General Manager, Sherbrooke Railway & Power Co., was killed in action in France recently, as mentioned in our last issue. J. H. Trimmingham, Superintendent of Power, who acted as General Superintendent during Major Pilcher's absence, has been appointed Sub Lieutenant in the Royal Naval Motor Boat Patrol Service, and has left for England. Capt. Thos. Irving, Assistant Accountant, is now with the 117th Eastern Townships Battalion at St. John's, Que., preparatory to going overseas. Chas. Johnstone, heretofore Accountant, has been appointed Acting Manager, and J. T. Kemp, heretofore with the Aetna Chemical Co., Drummondville, Que., has been appointed General Superintendent.

Contracts for Toronto Civic Railway Cars.

As announced in our last issue, the Toronto City Council has awarded contracts for materials for the assembling and construction of 13 double truck, double end operation, cars for the civic railway, as follows:

Bodies, Preston Car & Coach Co., each..	\$4,907.00
Trucks, Dawson & Co., Montreal, per set	828.50
Electrical equipment, Canadian Westinghouse Co., per set	1,866.00
Wire and cable, Eugene F. Phillips Co., Montreal, per car	123.17
Fare boxes, Coleman Farebox Co., each..	51.10

Tenders were invited originally for the cars complete and delivered in Toronto ready for operation, and also for the bodies, trucks and equipment separately. Two tenders were received for the complete cars, no. 1 for \$8,867 each, and no. 2 for \$9,075 each. Tender no. 1 offered to deduct \$158 if the step and door operating mechanism were supplied by the city. This mechanism would cost \$190 delivered, and the cost of unloading each car at Toronto was estimated at \$25, therefore, based on this bid, the price for each completed car would be \$8,925, or \$116.012 for the lot of 13.

Taking the tenders as submitted for the various parts the Works Commissioner reported that if the parts were purchased and assembled at the civic car barns, the price for each completed car would work out as follows:

Bodies, Preston Car & Coach Co.....	\$4,907.00
Trucks, Dawson & Co.	828.50
Electrical Equipment, Canadian Westinghouse Co.	1,866.00
Air brakes, estimated	350.00
Fareboxes, Coleman Farebox Co.	102.20
Wire and cable, Eugene F. Phillips Co.	123.17
Gears and pinions, Allen General Supplies	108.98
Step and door operating mechanism,	
National Pneumatic Co.	190.00
Unloading and assembling	144.65

	\$8,620.50
or for the 13 cars	\$112,066.50
a total saving of \$3,945.50.	

The St. Louis Car Co. originally bid \$3,300 for the bodies, and later amended its offer to deliver them in Toronto, with freight, duty and war tax prepaid, for \$4,643.50 each, to deduct \$30 a car if the city supplied the step and door operating mechanism, and also to allow a deduction of \$74 a car if the work of installing trucks, motor equipment, air brakes, wire cable and fare boxes were done in Toronto. These deductions brought the price of the car bodies to \$4,539.50 each, which was the lowest tender, but as it was not submitted on the form supplied by the city, it was declared informal. Had this tender been accepted, the total cost of each car complete would have been \$8,200, showing a total saving of \$5,466.50 on the order for 13.

Testing Air Brakes on British Columbia Electric Railway.

In the B.C.E.R. shops at Vancouver, air brake equipment is thoroughly tested at regular intervals. According to requirement of a provincial act gauges are tested once a month, and in accordance with M.C.B. rules brake cylinders are cleaned every six months. Pumps are generally overhauled once every two years. They are torn down, cleaned and scraped out.

To keep a record of the testing of brake cylinders, gauges, compressors and governors it has been found convenient to make use of a wall cabinet by means of which it is possible to indicate the work laid out for this department for six month periods. Opposite the car numbers, which

are arranged numerically, is a row of six ½-in. eye-hooks. If a car or a certain part of its air brake equipment is to be tested during this period a round white cardboard tag, metal bound, is hung on on, the tag representing the month this work is scheduled to be performed. As soon as the work is accomplished the tags are removed. A drawer at the bottom of the cabinet is used for the tags not in use. The tags are stamped with a single letter for the part requiring attention, thus G stands for gauge, P for pump and C for brake cylinder. The board is divided into sections for Vancouver city cars, interurban cars, locomotives and miscellaneous equipment.

The air brake department foreman makes out a weekly report of cleaning and testing in triplicate, one copy going

[illegible]

Weekly Report of Cleaning and Testing Gauges and Valves of Air Brake Equipment.

to the Master Mechanic, one to the General Superintendent and one being retained by himself. The standard M.C.B. report form for brake cylinders and triple valves is used.

International Traction Co.'s Eack Divi-
dends. — Buffalo, N.Y., press dispatch
June 9:—"The International Traction Co.
of which the International Ry. Co. is the
operating company, will pay 42% accumu-
lated dividend on the outstanding 4%
preferred stock on June 30, it was an-
nounced here today. For the first time
since the organization of the company in
1899, it was also announced, the directors
have declared a 1¾% dividend on the
common stock. The total dividend dis-
tributions on June 30 will be about
\$600,000. The International Ry. system
embraces all the electric lines in Buffalo
and along the Niagara frontier includ-
ing Niagara Falls, N.Y., and the Niagara
Falls Park & River Ry. in Canada.

Terminal Grain Elevator Construction is the title of an illustrated lecture given by C. D. Howe, A.M.Am.Soc.C.E., Chief Engineer, Dominion Grain Commission, before the Canadian Society of Civil Engineers' Regina Branch, and the Regina Engineering Society, at a joint meeting. June 22.

The beautifying and planting of the grounds of the Intercolonial Ry. station at Moncton, N.B., were completed June 8, the work having been carried out under the supervision of Mrs. Gutelius, wife of the General Manager, Canadian Government Railways.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry., and allied companies.—

	Apr. 1916	Apr. 1915	July 1, 1915 to Apr. 30, 1916	July 1, 1914 to Apr. 30, 1915
Gross....	\$549,046	\$540,861	\$5,531,193	\$6,295,902
Expenses	471,179	485,553	4,796,640	5,011,043
Net.....	77,867	55,308	734,553	1,284,859

Cape Breton Electric Co.—

	Apr.1916	Apr.1915	Jan. 1 to Apr.30,1916	Jan. 1 to Apr.30,1915
Gross	\$28,234.65	\$25,164.46	\$118,559.68	\$101,163.46
Expenses . .	18,295.86	15,336.62	76,004.32	63,844.35
Net	9,938.79	9,827.84	42,555.46	38,309.11

Morrisburg & Ottawa Ry.—A meeting of shareholders was called to be held at Ottawa, May 30, to pass resolutions forfeiting, under the provisions of the Ontario Railways Act, sec. 93, all stock upon which any arrearages for calls or interest were due. R. A. Bishop is Secretary-Treasurer.

Port Arthur Electric Ry.—Statistics of operation for April:

	1916	1915
Revenue	\$7,423.71	\$7,117.32
Operating expenses	5,880.84	6,223.29
Net earnings	<u>\$1,542.87</u>	<u>\$894.03</u>

Sherbrooke Ry. & Power Co.—

	Apr. 1916	Apr. 1915	July 1, 1915 Apr. 30, 1916	July 1, 1914 Apr. 30, 1915
Gross	\$10,925.27	\$9,361.04	\$112,598.53	\$100,555.09
Expenses .	5,900.08	4,421.17	57,744.37	55,143.41
Net	5,025.19	4,939.87	54,854.16	45,411.68

Toronto Ry.—

	1916	City percentage	1915	City percentage
Jan.	\$473,784	\$68,847	\$471,226	\$70,486
Feb.	470,764	70,614	440,313	66,047
Mar.	518,555	97,237	488,468	93,141
Apr.	496,172	99,234	467,701	93,540
May	500,354	100,063	468,953	93,790
	\$2,459,590	\$135,995	\$2,336,661	\$117,004

Toronto Ry., Toronto & York Radial Ry., and allied companies.—

	Apr.1916	Apr.1915	July1,1915to Apr.30,1916	July1,1914to Apr.30,1915
Gross . . .	\$873,209	\$895,816	\$3,546,784	\$3,227,243
Expenses	444,212	422,757	1,853,075	1,731,845
Net.....	438,997	373,059	1,793,709	1,495,398

Winnipeg Electric Ry.—

	Apr.1916	Apr.1915,	Jan. 1 to Apr.30,1916	Jan. 1 to Apr.30,1915
Gross.....	\$282,498	\$264,856	\$169,808	\$1,233,405
Expenses...	171,463	177,336	730,148	783'156
Net.....	111,900	111,035	87,520	450,249

Owing to the regulations in England respecting precautions to be taken in case of Zeppelin raids, the hours during which electric street cars can be operated has been curtailed in some towns. This has caused a loss in wages to those employed, amounting to about \$2 a week. In Northampton, where the cars are municipally operated, the wages are being paid as for a full number of hours. The employees declined to accept half rates.

Spitting on Cars.—The International Ry. has requested the Buffalo police to enforce the city ordinances prohibiting spitting and smoking on the street cars, and as a result a number of fines, ranging from \$5 to \$50, have been inflicted recently. So far as the enforcement of the regulations in Canada against spitting is concerned the bylaws are more or less of a dead letter.

The International Ry. is operating for the summer a new fast through service between the Buffalo, N.Y., terminal and Queenstown, Ont., via Niagara Falls, and the Upper Bridge across the Niagara Gorge, returning via the Gorge route. No stops are made between Buffalo and Niagara Falls, and the round trip is made in two hours.

British Columbia Electric Railway Bulletin.

The British Columbia Electric Ry. has commenced the issue of a bulletin for its patrons, from the first number of which the following is reproduced:

"Every Friday morning we expect to publish one of these little bulletins for our patrons' information and edification, and we hope that you will take one from the box, read it, and enjoy it.

"Our purpose is not hard to explain. We aim to give service, whether it is by way of a safe, speedy street car service or a reliable, efficient electric light service. But giving service is not so simple as it may seem, especially when Tom, Dick or Harry each wants a special brand of service different from the others. For instance, Tom, who lives at the end of one of the car lines, wants the car he is on to speed right through and wait for no one. Dick, who lives half way to town, waves at the motorman when he is half a block away from the track and wants to be waited on. Harry, who lives fairly close in, generally walks to work, but occasionally, when it is wet and disagreeable, he rides, and complains because the car is crowded with other persons situated similarly to himself. Now, it is impossible, in a system that is for all, for everyone to obtain exactly what he wants at all times, and so we try to strike a happy medium of service, intended to meet the wishes of as many persons as possible. If we did not run our cars by rule—or on schedule, as it might be put—we would not be giving service. You could not tell when you would get a car, or whether, having found one, it would take you to your destination.

"It is, then, one of the objects of this bulletin to acquaint you with your street car system and incidentally to help you to take the most benefit out of it. You are all anxious to get to your destinations as quickly and as comfortably as possible, and we, who are at your service, are anxious to comply with your wishes. There is just one thing lacking, namely, co-operation between company and patron.

"But why," you may ask, "do you request co-operation, when your company owns and operates the street cars? We ride and pay the bill. What more do you want?"

"The answer lies in our desire to work for the benefit of the public. There are certain things—trivial in themselves, but of great importance in the aggregate—that can be done only by the public. Fast schedules, accurate timing, up to date equipment can do their part in getting the tired business man to his home quickly, but the final element, the assistance of the man himself, has been lacking.

"But how can I assist in making the cars run faster?"

"By having the right fare ready, by handing the conductor your transfer unfolded, by getting on board the car quickly, and in many other ways you can assist the service. Many minutes each trip can be saved by such means. We dare say that many persons never think how they are delaying the system, and incidentally themselves, by not having their transfers unfolded when boarding a car. We want to teach you how to save the seconds on the back platform and how best to use a transportation system that is for you.

"This will be our method of talking to our patrons, and if you have any suggestions to make as to running our car system we want you to make them. Your wishes are what guide us in giving ser-

vice. All we ask is that you be reasonable. Sometimes we are in a better position than you are to choose when there are several opposing wishes which cannot all be satisfied. You may ask why we did not begin this before. Frankly, we were too busy extending our lines into new territory and doubling and trebling our equipment to meet growing conditions. What person during the boom years was not fully occupied with the industrial expansion?

"We believe we can say truthfully that we have been a prominent factor in building up Vancouver and the surrounding part of British Columbia. In our position as a public utility company we are in as close a relation to the people as a government is. We are in a position of trust, inasmuch as we serve the public with transportation, light, heat and power, a continued breakdown of which would paralyze industry itself. There are, therefore a great many interesting things about supplying electrical energy and street railway service that the public has a right to and should know. It will be our endeavor to place such facts before you in an interesting manner, and we invite your criticism. Furthermore, we have many aims in common with the citizens of Vancouver and of the surrounding district. The prosperity of Vancouver means prosperity for us. Though it might seem from this statement that our service is actuated by none but business motives, there is a corollary that our prosperity means better service to you. The tourist brings money to us and to the storekeepers. The factory brings payrolls in which everyone benefits. Population begets traffic, which begets service, and so on. The officials and employees of our company are citizens of the district we serve. A large percentage of them own their homes. All but a small percentage of our earnings remains in this district. We want to convince you that we are just as much interested in the prosperity of Vancouver as you are, and hope to enlist your assistance in making it the city that it should be."

The company offered prizes for the three best suggestions for a name for the bulletin, \$15 for first, \$10 for second, \$5 for third, to be submitted by June 30. For the guidance of competitors it gives the names of bulletins issued by other companies, as follows: Seattle, "The Electrogram"; Tacoma, "Public Service Forum"; Portland, "Watts Watt"; San Francisco, "Transit Tidings"; Denver, "Tramway Bulletin"; Baltimore, "Trolley News"; Olympia, "Public Service"; Sioux Falls, "On the Cars."

The Great Lakes Power Co., which, as announced in our last issue, has purchased the International Transit Co., operating a street railway and ferry service at Sault Ste. Marie, Ont., has also acquired the water power rights owned by the Algoma Steel Corporation, Ltd. It is the intention to increase the plant to 30,000 h.p., under plans and specifications prepared by J. O. Heyworth, M.Am. Soc.C.E., Chicago, Ill., and to have the extended plant ready for operation by Jan. 1, 1918. The company's chief officers are: President, S. Insull, Chicago; First Vice President, M. J. Insull, Chicago; Second Vice President, J. A. McPhail, Sault Ste. Marie, Ont.; Secretary, P. L. James, Chicago; Treasurer, R. W. Waite, Chicago.

Montreal Tramways Co's Wages, Etc.

The Montreal Tramways Co. voluntarily increased its conductors and motormen's wages on June 1. Following is a comparison of the old and new rates per hour:

	Old rate.	New rate.
1st and 2nd year men	22c.	23c.
3rd, 4th and 5th year men.....	23c.	25c.
After 5 years	25c.	27c.

The arrangement regarding uniforms remains the same as before. For the first two years the men pay half the cost, after which the company furnishes uniforms free. There is no extra allowance for Sundays or overtime, but schedules are made out to allow for about time and a half for all extras and trippers. About 70% of the men have been over 5 years in the service.

A. Gaboury, Superintendent, issued a bulletin to conductors and motormen on June 1, containing the following letter from J. E. Hutcheson, General Manager: "The management has had under consideration for some time the question of increased wages for conductors and motormen, and it is with pleasure that I am able to announce that commencing July 1 the wages per hour will be 23, 24 and 27c. respectively, instead of the rate of 22, 23 and 25c. which is in effect at present. There will be no change in the arrangement regarding clothing. The management appreciates very much the loyal services of the staff in the past, and feels confident of faithful co-operation for safe and efficient service in the future. I trust that the end of the war will mean the return of prosperity. In the meantime, assure all the employees of your department that their welfare is ever considered."

Edmonton Radial Railway Earnings, Etc.

	April 1916.	March 1916.
Revenue	\$48,458.19	\$52,631.96
Expenses	54,196.90	56,380.76
Passengers carried ...	982,674	1,081,451

Results of operation from Jan. 1 to April 30:

Expenditure.		
	1915	1916
Depreciation	\$10,979.16	\$8,617.76
Maintenance	17,420.23	15,226.78
Operation (including bank interest)	85,431.36	84,483.70
Power charges	34,547.66	36,677.10
	\$137,399.25	\$136,387.58

Revenue.		
	1915	1916
Cash fares	\$143,942.30	\$170,657.15
Ticket sales	39,313.00	21,862.40
Advertising	1,040.95	1,290.29
Special cars	72.90	167.95
Miscellaneous	1,519.78	2,660.25
	\$185,888.93	\$196,638.04

Capital Charges and Depreciation.		
	1915	1916
Debenture int.	\$47,853.64	\$47,331.92
Debenture redemption..	28,428.60	29,119.80
	\$87,261.40	\$85,068.76

In their report the Commissioners say: "Considering the city has decreased in population and that the citizens have received an improved service as compared with last year, the street railway is holding its own under trying conditions; that is, the street railway earned during the first four months of 1916, over and above its operating expenses, sufficient monies to pay all interest charges, as well as depreciation charges and leaving some \$4,500 on hand to apply on debenture sinking fund account."

Jitney Traffic Notes.

A number of jitneys are operating in London, Ont., the number having been increased owing to the suspension of Sunday operation by the London St. Ry.

The Esquimalt, B.C., Town Council has approved a bylaw respecting the operation of jitneys. A provision requiring a bond of \$5,000 for each car was held over for further consideration, as jitney men claim its enforcement will put a number of them out of business, for the summer traffic. Their interests are being looked after by the Victoria Jitney Association.

The jitney licenses in Vancouver, for the half year, expired May 31, and since then very few of the owners of cars have had them renewed owing to the bonds put up not being acceptable to the City Council. The license inspector has been instructed not to accept any bonds under the bylaw unless they are issued by a company doing business with the Dominion Government's approval. Most of the jitney bonds hitherto accepted were issued by a company which is unable to comply with the requirements in this respect. The jitney men were given a short time to obtain new bonds, and instructions were given to prosecute under the bylaw any jitney men who were operating cars without licenses. The bond issuing company in question is interested in an action taken to quash the council's resolution as to the bonds.

The New York Public Service Commission, second district, has issued a regulation, prohibiting jitneys operating on routes parallel to existing car lines in Rochester. In the course of the investigation some interesting figures were given to show how the presence of jitneys would congest traffic on street. C. R. Barnes, electric railway inspector, made checks to show that 450 vehicles ordinarily passed through Main St. in the evening rush hour. If jitneys were used to take off the passengers who now stand in the trolleys, 304 machines would have to be operated, increasing the traffic 70%. If jitneys were substituted entirely for street cars, Mr. Barnes showed that some 2,000 jitneys would have to be in operation from 5.4 to 37.8 seconds apart. Through Main St. more than 6,500 jitney movements an hour would be necessary. The summing up of the commission was that the existing electric railway of Rochester, viewed as a public agency rather than as a money-making machine, was distinctly worth saving, in the interest of the people of Rochester. It had performed very valuable service in the upbuilding of the city. As a result licenses were refused to 60 jitney operators.

Electric Railway Notes.

Saskatoon, Sask., Municipal Ry. employees are applying to the city council for an increase of wages.

The Saskatoon Municipal Ry. inaugurated a Sunday car service between Saskatoon and Sutherland, Sask., May 28.

Moncton Tramways, Electricity & Gas Co., Moncton, N.B., will change to one-man-car operation in the near future, as soon as the cars are equipped with the Coleman Fare Box Co.'s no. 4 stationary fare box.

A complaint against the Quebec Ry., Light & Power Co., before the Quebec Public Utilities Commission, relative to a cash fare charged for transfers on the

sillery line within the city limits, was heard on May 30, and was adjourned to June 15.

The Oshawa Ry. has ordered one 25-ton electric locomotive from Ottawa Car Manufacturing Co. It will be about 23 ft. long, mounted on trucks and equipped with 4 Westinghouse 101-B-2 motors, L-4 controller, and Westinghouse ET 6 air brake equipment.

Brantford, Ont., Municipal Ry., employees were, on June 2, granted an increase of 2½c. an hour. Stools are to be provided for motor men and conductors, and the conductors are to be supplied with change by the Commission. The union is not to be recognized.

The City Commissioners operating the Edmonton, Alta., Radial Ry. have reported against a proposition to discontinue operation of the cars on Sundays. The surplus revenue from the operation of the cars on Sundays from Jan. 1 to April 30 of this year was reported to be \$4,462.25.

The Hamilton, Ont., City Council has under consideration a revision of the city bylaw affecting the Hamilton St. Ry. traffic. The matter has been under the Street Railway Committee's consideration for some time, with the result that it is recommended that the present clause in bylaw 679 be dropped, and a new one substituted.

The litigation arising out of the attempt to pass the Hebert project for the granting of a new franchise to the Montreal Tramways Co. June 22, 1915, has been called off. The result of the whole matter is that the city is in the position it was before the application for an injunction, and is once more able to take up the question of the franchise with the company.

The Three Rivers Traction Co. has ordered one combination freight car and snow plough from Ottawa Car Manufacturing Co. It will be about 29 ft. long over end sills, equipped with a heavy nose, or wedge plough at the front end and a heavy wing plough at one side. The body, etc., will be mounted on 76-E trucks and equipped with 4 Westinghouse 101-B-2 motors and Westinghouse S-M-E air brake equipment.

Sunday Car Service in London.

The arrangement for the operation of cars on the London St. Ry. on Sundays expired June 6, and the service was discontinued. For some time prior to that date, negotiations were carried on between the company and the city regarding a renewal of the privilege. In return for the renewal, the city demanded the immediate construction of some extensions, some double tracking, the provision of additional cars and a general improvement of the service. The company advised the council that it was prepared to purchase certain second hand cars, of which the City Engineer declined to approve, and also pointed out the difficulty of obtaining steel for new lines. The Board of Control, on June 9, decided to recommend the city council to remain firm in the position it had taken. Negotiations were however continued, and on June 16 a special meeting of the council was called for the following day to complete arrangements for a continuation of the Sunday service. Further negotiations and considerable discussion took place at the meeting on June 17, but without any satisfactory arrangement being arrived at, and the service on Sunday remains suspended.

Cost of Track Weeding on Interurban Railways.

The cost of track weeding on 16 electric interurban railways is given in the American Electric Railway Association's official journal, from a compilation made by E. Karow, Assistant to Vice President, Twin City Rapid Transit Co., Minneapolis, which appeared in reply to a question as to the best method of weeding. The figures of annual cost per mile of single track are as follows:

Company no.	Manual Labor	Chemicals	Weed Burner
1	\$37.50	.....	\$6.25
2	50.00	\$23.90	.....
3 .....	.....	.....	7.50
4 .....	.....	6.00	.....
5	20.00	.....	15.00
6	27.04	.....	.....
7	52.50	.....	.....
8 .....	.....	.....	4.66
9 .....	.....	36.54	.....
10	18.30	.....	.....
11	58.00	12.00	12.00
12	55.00	25.06	.....
13	50.00	43.55	.....
14	75.00	25.00	.....
15	50.00	33.00	.....
16	70.00	28.80	.....

Average .. \$47.00 \$26.00 \$9.00

Some companies clean their track to the end of the ties and others for a considerable distance beyond. Where manual labor is relied on, the track has to be weeded from one to three times per year; but the track is left in the cleanest condition. Burning is the cheapest scheme; but the track is left unsightly, and the work has to be repeated as often as hand weeding. Chemical treatment is the most effective; the cost is high in the first year, but lower in the second and third years.

Toronto Suburban Ry. Wins Case.—

The Ontario Railway and Municipal Board decided June 22 that the Toronto Suburban Ry. has the right to connect its existing line at Lambton, Ont., with its extension to Guelph. The City of Toronto opposed the company's application. If the Toronto Suburban changes its existing gauge of 4 ft. 10¼ in. to the standard, 4 ft. 8½ in., which is the gauge of the Lambton-Guelph extension it will be enabled to run through cars from Guelph to Lambton, thence along Dundas St., Keele St. and Davenport road to Bathurst St. and down that street for some distance in Toronto.

Telegraph, Telephone and Cable Matters.

The Great North Western Telegraph Co. has opened offices at Valcartier Camp, Que.; Camp Borden, Ont.; Richlea, Sask., and Stanmore, Alta., and has closed its office at Chandler, Sask.

The following changes have taken place in the C.P.R. Telegraph Department: W. M. Godsoe, heretofore Superintendent, Atlantic Division, St. John, N.B., has been appointed Commercial Representative in Nova Scotia, Halifax; A. C. Fraser, heretofore Superintendent, Eastern Division, Montreal, has been appointed Superintendent, Atlantic Division, St. John, N.B., vice W. M. Godsoe; W. D. Neil, heretofore Superintendent of Traffic, Eastern Lines, Montreal, has been appointed Superintendent, Eastern Division, Montreal, vice A. C. Fraser; W. M. Thompson, heretofore chief operator, Montreal, has been appointed Superintendent of Traffic, Eastern Lines, Montreal, vice W. D. Neil; J. G. Davies has been appointed chief operator, Montreal, vice W. M. Thompson; E. W. Clayton, heretofore Agent, Nelson, B.C., has been appointed Agent, Victoria, B.C.

Marine Department

Freight Steamships Being Built at Port Arthur.

As previously stated in Canadian Railway and Marine World, two steel freight steamships are being built at Port Arthur, Ont., one for the Great Lakes Transportation Co., of which Jas. Playfair, Midland, Ont., is President and General Manager; and the other for the British Sulphite Fibre Co., of Vancouver, B.C., in which Jas. Whalen, of Port Arthur, Ont., is interested. They are sister ships, with the following general dimensions:

Length over all	251 ft.
" between perp.	251 ft.
Breadth moulded	43½ ft.
Depth moulded	28 ft. 2 in.
Carrying capacity about	3,000 gross tons

They will be of the single deck type, with poop, bridge and forecastle, steel deckhouse on bridge deck and chart room on top of deckhouse, with navigating bridge, and will be built on the transverse system of construction. There will be two cargo holds with two hatches in each hold, no. 1 hold to extend from collision bulkhead to boiler room bulkhead, and no. 2 hold to extend from engine room bulkhead to after peak bulkhead. The propelling machinery is located amidships. The double bottom will be 3 ft. deep and extend from collision bulkhead to after peak bulkhead, divided by transverse water or oil tight floors into a suitable number of compartments. Part of the double bottom will be utilized to carry fuel oil, the remainder of the fuel to be carried in wing tanks, which can also be used for coal. The officers and crew will be berthed amidships on bridge deck, where the mess rooms, galley, pantry, water closets, etc., will be situated. The firemen and sailors will have their quarters aft on main deck.

The main boilers will be of the Scotch marine type, single ended, arranged abreast. They will be 14½ diam. by 11 ft. long and have a combined grate area of 126 sq. ft. Each boiler will have three corrugated furnaces, of the suspension type, 42 ins. inside diam. The boilers will be fitted for natural draught.

The propelling machinery will consist of triple expansion engine, with surface condensers, built-in type, 3-cylinders each, working each on a separate crank placed at an angle of 120 degrees. Slide motion to be of Stephenson link type. Cylinders 20, 33 and 54 in., with a stroke of 40 in. The average working horse power to be 1200, maximum 1300. The high pressure cylinder will have piston valve, and the low and intermediate double ported slide valves, with relief frames, and the low pressure cylinder will have a Lovekin assistant cylinder. The high pressure cylinder will be supplied with a loose bushing of hard cast iron. All cylinders will have relief valves, top and bottom, discharging into the atmosphere. The turning gear will consist of a single cylinder engine, driving through worm gearing a shaft mounted on sliding cast steel worm.

The propeller will be of cast iron, solid section, with four blades. The air pump will be of the Edwards type, bolted to the back column of the engine. The steam steering gear will be placed on the main deck in engine room. There will also be a hand steering gear aft, and an 8x2 in. steam windlass fitted with hand attachment and friction brakes. All anchors

will be of the stockless type, of size in accordance with Lloyd's requirements. To facilitate the handling of the cargo there will be six 7x12 in. reversible steam winches, and 6 derrick booms to lift 4 tons each.

The vessels will be fitted throughout with electric light. One 7½ k.w. generator will be fitted in engine room. All wires, with the exception of those in cabins, will be enclosed in conduit, with outlets terminating in watertight fixtures. In the cabins the wire will be run in wood mouldings.

The vessels are being built by the Western Drydock & Shipbuilding Co. to take the highest class in Lloyd's Registry and under their special survey.

Steel Shipbuilding in Nova Scotia.

As stated in Canadian Railway and Marine World for April, the Nova Scotia Steel and Coal Co. is commencing building a steel steamship for its coal trade along the coast. She will be of about 2,000 tons dead weight capacity, 220 ft. long, 35 ft. beam and 20 ft. moulded depth. She will be built to Lloyd's classification, with all scantlings 10% in excess of classification requirements. It was expected that the keel would be laid during June, and the launching, depending on labor conditions and the delivery of material, will probably take place late in the autumn. The stem, stern post and rudder forgings, all propelling shafting, propeller and all fittings, all the frame angles, floor plates, etc., are to be made by the Nova Scotia Steel and Coal Co., at its New Glasgow works.

The propelling machinery will consist of a 1,000 shaft h.p. De Laval geared turbine, geared to the propeller shaft through two sets of gears. This will, it is said, be the first vessel built in Canada with a geared turbine, and it will also be the first vessel to be equipped with a De Laval geared turbine for driving the propellers. The equipment will also be unique in regard to the auxiliaries, having a rotary pump and centrifugal circulating pump, driven by a single engine.

Work is in progress on the building yard, which is located on the East River, near the Eastern Car Co.'s plant, which is also subsidiary to the Nova Scotia Steel and Coal Co. Thomas Cantley, President and General Manager, in writings us, says: "This is the initial venture, which may lead to far reaching results in the development of a naval and commercial steel shipbuilding industry."

Investigation into Stranding of s.s. Ennisbrook.

An investigation into the cause of the stranding of the Brook Steamship Co.'s s.s. Ennisbrook, off Glace Bay, N.S., May 15, was held recently before Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. R. MacDonald and A. J. Morrison as nautical assessors. After weighing the evidence, which was short while covering the facts, the court found that the master, H. J. Vickers, showed lack of judgment in navigating his vessel from Cape North to the place of grounding. He had clear weather, with light northerly winds, from the time of passing Cape North, with clear water on his port side, and on his starboard side ice

was bordering the Cape Breton coast, and the current, if the trouble had been taken to ascertain it, would have been found running southwesterly, and both current and wind were influencing the ice. His intention at first was to make Sydney for bunkering, but on the way from Cape North, when he found so much ice in shore, he changed his mind and decided to go to Louisburg, as there was a clear passage there, but when in the neighborhood of Flint Island, when the ice was all on his starboard in masses, with clear water in shore, he thought he could make Sydney, and retraced his way to reach it. The court considered that in view of the fact that the master and mate were strangers to the locality, and owing to the masses of ice on the weather side and closing down gradually, it was most unwise and careless navigation to bring the vessel so near land, even after observations were made to ascertain the position of the vessel, which were not, however, plotted on the chart produced. After the grounding, every method possible was adopted to release the vessel, and there was no criticism on that point. Not wishing to cause delay to the dispatch of the vessel, which was only very slightly damaged, the court did not deal with the master's certificate, but severely censured him and reprimanded him for his lack of judgment, both in entering the ice and for careless navigation in approaching so near to land which was unknown to him, especially under the difficulties which would have been apparent even to those not accustomed to the sea.

Vessel Casualties on the Great Lakes.

The Canadian Lake Protective Association has issued its second casualty report for the season.

In view of the risk of damage and delay from fire, exemplified by one of the casualties reported, it has been resolved by the Association's committee that smoking be prohibited in sleeping quarters on all steamships. Instructions have been given accordingly to all members, and all masters are asked to see that the rule is strictly observed.

It has also been resolved to adopt a recommendation of the Great Lakes Protective Association that no vessel should attempt to pass another in the shallow and narrow channels between the lower end of Port Huron middle ground and Corsica Shoals lightship, and between the upper end of Russell Island and the lower end of St. Clair Flats Canal.

The committee will hereafter withhold from publication all reported casualties which in its opinion are not sufficiently serious or culpable to be of general interest. Masters will understand that they should report all casualties and it will be for the committee to determine which of these will be mentioned in the bulletin. Under this rule the present bulletin omits several reported casualties.

Danger of vessel collisions during darkness and fog will, according to a press dispatch from London, Eng., be practically eliminated very shortly, owing to a new device invented by W. Marconi, of wireless telegraph fame. It is said that the device is easily installed on vessels, and is operated from the bridge.

Proposed Further Diversion of Water from the Great Lakes.

The State of Illinois is proposing to divert water from the Great Lakes for a traffic canal from Chicago to the Illinois and Mississippi Rivers, and the Governor of the State and a number of congressmen recently waited on the Secretary for War asking for the approval of plans for the construction of the canal at an expenditure of about \$5,000,000. The Dominion Marine Association has filed a protest and asked for an opportunity to present the views of the Canadian navigation interests, and has been advised by the Secretary for War that the matter is being held for further consideration, and that if further hearings take place the Association will be given an opportunity to express its opinion.

A bill is at present passing through Congress to sanction the Illinois Legislature's action in authorizing this expenditure. The Senate has added an amendment to the bill limiting the amount of water to be withdrawn to 250,000 cub. ft. a minute, being the limitation in force in 1912, when an application was made unsuccessfully to increase the amount of water which may be withdrawn. This amendment is being discussed in the lower house, and the matter has become the subject of representations from the Dominion Government with reference to Canadian interests in the waters of the Great Lakes. At a conference with the Dominion Government on the subject, at which F. King, Counsel, Dominion Marine Association; A. A. Allan, President, and T. Robb, Secretary, Shipping Federation of Canada; W. G. Ross, Chairman, Sir John Kennedy, Consulting Engineer, F. W. Cowie, Chief Engineer, and D. Seath, Secretary, Montreal Harbor Commissioners; J. G. Sing, C.E., representing the Toronto Harbor Commission; C. A. McGrath, of the International Joint Waterways Commission; the Deputy Minister, and Assistant Deputy Minister of Public Works, the Deputy Minister of Marine, and W. J. Stewart, Chief Hydrographer, were present, it was strongly

urged that the conservation of the waters of the Great Lakes and St. Lawrence River is essential to the trade and commerce of the Dominion. The conclusion arrived at was to reaffirm the position previously taken by the Dominion Government against any further diversion of water from Lake Michigan.

The Davidson & Smith Elevator Co. Ltd., is reported to have purchased the s.s. Panther from the Massey Steamship Co., Duluth, Minn., for operation in the Canadian lake trade. She is a wooden vessel with diagonal strapping on frames, steel arches, bow sheathed for ice, steel boiler house, steam pump wells. She was built at West Bay City, Mich., in 1890, and was practically rebuilt there in 1912. She is equipped with fore and aft compound engines with cylinders 24 and 4 6ins. diam. by 42 ins. stroke, 600 i.h.p. at 86 r.p.m., supplied with steam by one Scotch boiler 12 by 13 ft. at 120 lbs. Her dimensions are, length 236 ft., breadth 36 ft., depth 24 ft.; tonnage, 1634 gross, 1140 register.

Canadian Pacific Ocean Service Flag.—Since the C.P.R. first entered the steamship business its red and white checkered flag has become well known on both the Atlantic and Pacific oceans, and in most ports of importance on both sides of both oceans. A slight alteration has been made in flag, owing to the transfer of the steamships to Canadian Pacific Ocean Services, Ltd. It consists of the addition of the monogram letters C.P.O.S. placed in the centre.

The Chatham Steamship Co., Ltd., has been incorporated under the Quebec Companies Act, with \$10,000 authorized capital and office at Quebec, to own and operate steam and other vessels, and to carry on a general trading and navigation business. W. Q. Stobo, H. C. Thorn, C. J. Griffis, J. Graham and L. H. Cote, Quebec, are the incorporators.

The use of magnetic chucks in machining steel and iron parts is now fairly common in up to date plants, especially for thin parts where the use of clamps is apt to spring them out of shape.

Shipbuilding in British Columbia.

The passing of the British Columbia Shipping Act, providing for aid to the shipbuilding industry in the province, has given considerable impetus to a number of schemes to increase the coast shipping trade, as well as to relieve the general congestion, chiefly in the lumber trade, resulting from the shortage of tonnage due to war conditions. A company is in process of organization, in which Jas. Carruthers, J. W. Norcross, Sir Trevor Dawson, and M. J. Haney, all connected with Canada Steamship Lines; Jas. Whalen, Port Arthur, Ont.; R. M. Wolvin, Winnipeg, and H. W. Brown, formerly associated with the Pittsburgh Steamship Co., a subsidiary of the U.S. Steel Corporation, are interested, and orders have been placed with the Wallace Shipyards Ltd., Vancouver, for three steel vessels of about 2,500 tons capacity each, of the five masted type with auxiliary power. Other vessels will be ordered, and it is expected to have ten such ships completed by the end of the year. H. W. Brown, who is to be General Manager of the new company, was formerly located at Duluth, Minn., but has removed to Vancouver, where he will remain in his new capacity.

St. John Dry Dock & Shipbuilding Co. Ltd. has been incorporated under the Dominion Companies Act, with an authorized capital of \$1,000,000, and office at St. John, N.B., to carry on a general building and contracting business, and to build, own and operate all kinds of transportation equipment, including railways, railway material, rolling stock, steam and other vessels, wharves, docks, etc., and to carry on a general transportation and navigation business.

Sorel Shipbuilding and Coal Co., Ltd., has been incorporated under the Dominion Companies Act, with \$100,000 authorized capital and office at Montreal, to carry on the businesses of shipbuilders and repairers, to own and operate steam and other vessels, docks, and wharves, and to deal in fuel, coal and general merchandise, etc.

List of Steam Vessels Registered in Canada During May, 1916.

No.	Name	Port of Registry	Where and When Built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
133954	Becancour	Sorel, Que.	1911 Sorel, Que.	93 0	22 55	9 0	214	84	48 sc.	The Minister of Marine and Fisheries, Ottawa.
133514	Calgary	Midland, Ont.	1912 Newcastle-on-Tyne,	248 0	42 5	17 3	1639	1306	105 sc.	Great Lakes Transportation Co., Midland, Ont.
138096	Collinge	Montreal	1881 Cleveland, Ohio	261 8	38 4	19 6	1707	971	79 sc.	C. Webster, Montreal.
133953	Deschailons	Sorel, Que.	1914 Sorel, Que.	93 0	22 55	9 1	214	76	48 sc.	Minister of Marine and Fisheries, Ottawa.
106022	Freshfielda (a)	Montreal	1896 Glasgow, Eng.	345 0	44 1	24 6	3445	2166	500 sc.	R. L. Smith, Ltd., Montreal.
135238	Impoco	Sarnia, Ont.	1913 Grangemouth, Eng.	249 5	43 1	19 7	2257	1384	157 sc.	Imperial Oil Co., Sarnia, Ont.
134616	J. H. Wade	Sault Ste. Marie, Ont.	1890 Cleveland, Ohio	265 6	38 1	13 1	2301	1389	111 sc.	J. Hawson, Sault Ste. Marie, Ont.
133955	Vercheres	Sorel, Que.	1906 Sorel, Que.	92 83	17 0	6 50	147	53	24 sc.	Minister of Marine and Fisheries, Ottawa.
138107	Wm. J. Averell	Montreal	1884 Detroit Mich.	260 0	36 8	14 3	1854	1063	89 sc.	Lake & River Transportation Co., Montreal.

(1) Formerly "Clement", and "La Plata."

List of Sailing Vessels and Barges Registered in Canada During May, 1916.

No.	Name	Port of Registry	Rig	Where and When Built	Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner	
134180	Carrie & Nellie	Shelburne, N.S.	Schr	Shelburne, N.S.	1916	103 0	24 7	10 7	85	J. B. Patten & W. Forsay, Grand Bank, Nfld.
134179	Emily H. Patten.		Schr		1916	108 4	26 0	10 8	152	
137942	Griff (b)	Vancouver, B.C.		Seattle, Wash.	1911	133 0	40 0	12 6	641	Coastwise Steamship & Barge Co Vancouver
138099	H. C. M. Derrick 1	Montreal.	Scow.	Montreal.....	1915	75 5	27 2	6 4	198	Harbor Commissioners, Montreal, Que.
138100	" " " 3.	"	"	"	1915	77 0	27 2	6 4	197	
138101	" " " 4.	"	"	"	1913	80 5	27 0	5 9	196	" "
138102	" " " 5.	"	"	"	1914	80 1	27 1	5 8	197	" "
138103	" " " 6.	"	"	"	1913	80 1	27 0	5 9	195	" "
138104	" " " 7.	"	"	"	1914	87 1	31 1	7 2	289	" "
138097	H. C. M. Dredge 6	"	Dredge	Sorel, Que.	1911	104 2	39 2	8 9	556	" "
138098	H. C. M. Drill Boat 1	"	Scow...	Montreal.	1910	80 3	57 3	4 0	198	" "

(b) Foreign name, Pioneer Sand and Gravel Co.

Atlantic and Pacific Ocean Marine.

A movement is on foot in Vancouver to make that port the headquarters for the chartering and management of British vessels engaged in the Pacific Ocean trade.

The Robert Dollar Steamship Co. has leased the Great Northern dock at Vancouver, B.C., for handling its trans-Pacific vessels. It has been using the dock for some time.

The Norwegian s.s. Lyngfjord, which ran ashore at Holyrood, St. Mary's Bay, Nfld., June 1, during a dense fog, was towed off by the s.s. Portia on the following day, and taken to St. Vincent's Harbor. She is owned by O. M. Milberg & Co., Christiania, and was formerly the Evangelos, owned by a Greek firm, and built at Sunderland, Eng., in 1890.

The steamships Korea and Siberia, formerly a part of the Pacific Mail Steamship Co.'s fleet, which was sold on that company ceasing business last year, to the Atlantic Transport Line, New York, are now reported to have been sold to the Toyo Kisen Kaisha of Japan. They were built at Newport News, Va., in 1902 and cost \$3,975,114. The price paid for them both, by the Atlantic Transport Line, which is a constituent of the International Mercantile Marine Co., was \$2,000,000. It is stated that the Japanese company first offered \$3,000,000 for them, but eventually purchased them for \$4,000,000. Since their first purchase they have been running between New York and London.

Maritime Provinces and Newfoundland.

The name of the s.s. Elizabeth, registered at St. John, N.B., and owned by the Marine Department, has been changed to Thos. Mason.

Annapolis Shipping Co., Ltd., has been incorporated under the Nova Scotia Companies Act, with \$50,000 authorized capital and office at Annapolis Royal, to own and operate steam and other vessels, etc. D. Owen, F. W. Pickels and H. Edwards are interested.

Hillcrest Shipping Co., Ltd., has been incorporated under the Nova Scotia Companies Act, with \$24,000 authorized capital and office at Lunenburg, to purchase the schooner Hillcrest, and to carry on a general carrying business. The incorporators are A. H. and E. F. Zwicker and W. E. Knock, Lunenburg.

Press reports from Halifax, N.S., state that the Board of Trade has received three enquiries as to available sites and possible bonuses for shipbuilding plants in the neighborhood. It is stated that all of the enquiries are from Great Britain, and are the outcome of an advertising campaign carried out by the board.

Tug Atlantic Ltd., Tug Anticosti, Ltd., Tug Mouton, Ltd., Tug Anita, Ltd., Tug Nora J., Ltd., Tug Ralph E. S., Ltd., and Tug Rosemary, Ltd., have been incorporated under the Nova Scotia Companies Act, each with \$10,000 authorized capital. These tugs are all registered as owned by interests associated with Neville Canneries, Ltd., Halifax.

The Reid Newfoundland Co.'s s.s. Kyle was taken off her route on the Cabot Strait for her annual overhaul early in June. She was relieved by the s.s. Sagona, from the Battle Harbor route, which, in turn, was relieved by the s.s. Ethie from Cabot Strait. On the return of the s.s. Kyle to service, June 12, the

s.s. Sagona was placed on the mail route to Labrador.

The s.s. Empress, which the C.P.R. acquired recently from the Charlottetown Steam Navigation Co. for operation in its Bay of Fundy service, was placed on the route between St. John, N.B., and Digby, N.S., May 30. Her captain and chief engineer are A. MacDonald and J. A. Ledingham respectively. The s.s. Yarmouth, on the same route, is in charge of A. G. Potter, captain, and J. M. Pendrigh, chief engineer.

Province of Quebec Marine.

The Quebec and St. Laurent Salvage and Wrecking Co. is being organized in Quebec for general salvage business. E. Tremblay, who is the chief person interested, was engaged in the examination of the wrecked s.s. Empress of Ireland in 1914. The schooner Tousignant is reported to have been purchased and to have been equipped with two gasoline engines.

Considerable progress is being made on the construction of the dry dock at Lauzon, where a large staff is working day and night. The power house is practically completed, as is also the foundation for the pumphouse. Most of the power house machinery was installed during June. About 300 ft. of excavation on the river side has been completed, together with the entrance.

The traffic through the Lachine Canal during May showed a slight decrease from May, 1915. The chief decrease was in grain, being 7,412,025 bush., and all other commodities showed decreases with the exception of coal, in which there was an increase of 100,890 tons. The total tonnage handled was 523,999 tons, against 616,505 tons in May, 1915. The number of vessel passages was 968, against 1,070 in May, 1915.

Work was started at the end of May on the landing shed along the new dock near the Harbor Commissioners' elevator at Quebec. The building is to be 600 x 102 ft., of structural steel, with concrete walls. Galleries are to be placed on the roof. The contract calls for completion by Sept. 15. The work is being carried out by J. Gosselin, under the supervision

of St. George Boswell, Chief Engineer, Quebec Harbor Commission.

Ontario and the Great Lakes.

Wrecking operations were undertaken during June on the s.s. Charles S. Price, which was overturned in the Nov., 1913, storm on the Great Lakes. The vessel was located in Lake Huron near the Fort Gratiot light.

The Dominion Government has decided, on the representations of interests at Chatham, to do some dredging in the Thames River, and has sent a dredge to dredge a 14 ft. channel from Chatham to Lake Ontario.

A verdict of \$2,000 damages was awarded to J. C. Freeman, a bridge keeper at Bolsover, against the Lake Simcoe Navigation Co., for injuries sustained by him when the company's s.s. Otonabee struck the bridge he was tending.

The Northern Navigation Co.'s s.s. City of Midland, which was burnt, and sank at her moorings, alongside the wharf at Collingwood, in March, was raised June 10, and placed in the dry dock there. It is reported that she will be converted into a tow barge or a scow.

The Montreal Coal & Dock Co. Ltd. has been incorporated under the Ontario Companies Act, with \$40,000 capital and office at Toronto, to own and operate steam and other vessels, deal in coal and other merchandise and to carry on a general shipping business.

The Grain Growers' Grain Co. is reported to have arranged for the erection of a grain elevator on the north water front at Port Arthur, with capacity for 300,000 bush. This, it is stated, will be a hospital elevator, to replace the one burned there a few months ago.

The Hamilton Ship Building & Ferry Co. Ltd., which was incorporated recently with \$100,000 authorized capital and office at Hamilton, is said to be a subsidiary of Canada Steamship Lines Ltd., and will operate the ferry service at Hamilton. J. G. Gauld is President.

The Toronto Harbor Commissioners have deposited with the Public Works Department at Ottawa a description of the site and plans of the harbor head walls

Saulte Ste. Marie Canals Traffic.

The following commerce passed through the Saulte Ste. Marie Canals during May.

ARTICLES		CANADIAN CANAL	U. S. CANAL	TOTAL
Copper.....	Eastbound		13,423	13,423
Grain.....	.....	6,923,875	8,913,239	15,837,114
Building stone.....	.....		
Flour.....	.....	415,760	461,170	876,930
Iron ore.....	.....	1,348,581	6,795,974	8,144,555
Pig iron.....	.....		8,292	8,292
Lumber.....	M. ft. b.m.	1,652	33,641	35,293
Wheat.....	.....	14,821,592	22,511,811	37,333,403
General merchandise.....	.....	15,394	8,924	24,318
Passengers.....	.....	1,061	32	1,093
Coal, hard.....	.....	9,800	241,581	251,381
Coal, soft.....	.....	99,000	1,976,552	2,075,552
Flour.....	.....		205	205
Grain.....	.....		100	100
Manufactured iron.....	.....	834	29,334	30,168
Iron ore.....	.....		
Salt.....	.....	4,487	129,396	133,883
General merchandise.....	.....	37,512	125,301	162,813
Passengers.....	.....	630	33	663
SUMMARY				
Vessel passages.....	Number	776	2,439	3,215
Registered tonnage.....	Net	1,764,616	7,653,838	9,418,454
Freight—Eastbound.....	Short tons	1,981,127	7,771,361	9,752,488
—Westbound.....	.....	147,787	2,393,201	2,540,988
Total freight.....	.....	2,128,914	10,164,562	12,293,476

to be built in Toronto Bay, from the eastern extremity of the old western channel to a point about 450 ft. east of Spadina Ave.

The Toronto Ferry Co. has equipped its ferry vessels with life saving floats, each 15 ft. long by 2 ft. wide by 15 ins. high, with accommodation for 16 persons. The casing of the float contains three air tight compartments. These are additional to the full equipment of lifebelts with which all vessels are equipped.

The Detroit and Windsor Ferry Co. has submitted to the Dominion Government plans for the construction of docks at the foot of Ouellette and Ferry Aves., Windsor, at an estimated cost of between \$125,000 and \$150,000. It is stated that work will be commenced about the beginning of July if the plans are passed.

The Toronto Harbor Commissioners, in conjunction with the city council, are considering the establishment of coal handling facilities in the harbor. During June, J. Laxton, one of the commissioners, and E. L. Cousins, Harbor Engineer, accompanied by the Mayor and Works Commissioner, visited a number of ports in the U.S. equipped with coal handling plants.

The Toronto, Hamilton & Buffalo Ry. has purchased a ferry steamship from the Great Lakes Engineering Works, Detroit, Mich., for operation between Port Maitland, Ont., and Ashtabula, Ohio. A ferry slip and dock is to be built on the Grand River at Port Maitland. It is expected that the service will be commenced in August.

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater for May as follows: Superior, 603; Michigan and Huron, 580.49; Erie, 572.87; and Ontario, 247.13. Compared with the average May levels for the past ten years, Superior was 1.14 ft. above; Michigan and Huron 0.08 ft. below; Erie, 0.14 ft. above, and Ontario 0.33 ft. above.

It is reported that the whole of the stock of the St. Lawrence and Chicago Steam Navigation Co. has been handed in under the agreement by which Canada Steamship Lines, Ltd., acquires it at 185, with the exception of three shares held in Dublin, Ireland. The final clearing up of the whole stock is therefore a little delayed, owing to the disturbances there, during which the post office was held by some of the rebels.

Manitoba, Saskatchewan and Alberta.

The Peace River Tramway & Navigation Co.'s s.s. D. A. Thomas, which, it was expected, would be launched about the end of May, as mentioned in our last issue, was launched at Peace River Crossing, Alta, June 6. She will ply on the Peace River from Hudson's Hope to Fort Vermilion, about 600 miles. The hull is of British Columbia fir, cedar and pine, and she is equipped with engine of 800 h.p. Oil tanks have been installed, so that liquid fuel may be used.

British Columbia and Pacific Coast.

The Alberta Pacific Elevator Co. is stated to be arranging for the reconstruction of its elevator at Vancouver, which was burned at the end of May.

Side Streams Navigation Co., which operates the s.s. Vidette, from Dawson, Yukon, has appointed W. Bailey, captain, and G. W. Watenbaugh, chief engineer, for this season.

Navigation on the Yukon River opened early in June, the first steamboats from White Horse for through trips sailing on June 5, the Yukon for Fairbanks, Alaska and the Casca for Dawson.

The Union Steamship Co. is reported to have purchased the s.s. British Columbia from the Coast Steamship Co., for operation in the coast freight trade. Her dimensions are, length 170.7 ft., breadth 21.7 ft., depth 10.5 ft.

The Imperial Oil Co. has built a wharf in Victoria harbor, extending 150 ft. from the shore. It is L shaped, 50 ft. long by 40 ft. wide, and there is a depth of 20 ft. of water at the end. The chief object is the supply of fuel oil to vessels.

Western Shipping Co., Ltd., has been incorporated under the B.C. Companies Act, with \$40,000 authorized capital and office at Victoria, to build, own and operate steam and other vessels and to carry on a general navigation and trading business.

D'Alton C. Coleman, Assistant General Manager, Western Lines, C.P.R., is credited with the statement that the company has under consideration the building of a new dock of the same type as pier A, at Vancouver, and that a decision will be made shortly so that construction may proceed.

The Marine Department received tenders recently for the construction of a lighthouse tower, fog alarm building and dwelling combined, at Triple Island, Brown Passage, the main entrance to Prince Rupert harbor from the open sea, to replace the old gas beacon at that point.

The C.P.R. s.s. Princess Charlotte has been equipped with a supply of buoyant rafts, each capable of carrying 26 persons. They are so arranged on the vessel that they will float off in case the vessel became submerged. By adopting this additional life saving equipment the vessel will be able to carry 1,000 passengers.

A press report from Victoria states that a syndicate headed by M. P. Cotton of Vancouver is negotiating for the lease of the G.T.P.R. dry dock completed recently at Prince Rupert for building of freight steamships. It is stated that possibly steel vessels will be built there, and that the syndicate is applying to the Government for assistance in building four such vessels of about 5,000 tons each.

The Grand Trunk Pacific Coast Steamship Co.'s s.s. Prince John was taken from the Alaska route June 13 and placed on the run from Vancouver and way ports to Prince Rupert and Queen Charlotte Islands, replacing the s.s. Prince Albert, which has been utilized for miscellaneous freighting purposes. The s.s. Prince Rupert was taken off her route between Seattle, Prince Rupert and Alaska June 5 for general overhaul at Victoria, the s.s. Prince George taking her place. The Prince Rupert was replaced in service June 13.

The Cameron & Genoa Mills Shipbuilders Ltd. is the name of a company which, it is reported, is commencing the construction of two shipways on the west side of the inner harbor at Victoria, south of the Point Ellice bridge. The interests comprising the company are associated with the Cameron Lumber Co. and the Genia Bay Lumber Co., and it is stated that they have secured a lease of land formerly a part of the Songhees Indian Reserve. Wooden ships with capacity for about 1,500,000 ft. of lumber are to be built.

An application has been made in B.C. courts for a winding up order against the

Dominion Shipbuilding, Engineering & Drydock Co., on the ground that it is insolvent and unable to meet its accounts, and an order is also asked for an enquiry into the condition of the company's affairs, the actions of its directors and the disposal of its assets. The company was incorporated in 1914 with an authorized capital of \$5,000,000. Among those interested in the company are Capt. H. Mowat, formerly Marine Superintendent, C.P.R., and F. F. Busted, formerly Engineer in charge of second tracking, Kamloops, B.C.

Water Pollution on the Great Lakes.—At a meeting of the International Joint Waterways Commission at Detroit, Mich., June 26, a report was made by the commissions' engineers on the pollution of the Great Lakes, with special reference to navigation, and a general discussion of the subject took place. Before any definite conclusion as to methods of dealing with it are reached the fullest consideration of the whole subject will be given and tests of proposed appliances made, more particularly as the larger problem requiring immediate solution is one with relation to land drainage from the various municipalities bordering on the lakes. Representatives of the Dominion Marine Association were present and took part in the discussion.

Claims re s.s. Empress of Ireland Disaster.—The Registrar of the Admiralty Court made his final award, at Montreal, June 2, re claims arising out of the sinking of the C.P.R. s.s. Empress of Ireland by the s.s. Storstad in the St. Lawrence River about two years ago. The claims totalled \$3,069,482, and the amount available to meet them was \$182,242, which was received from the sale of the s.s. Storstad. The costs were \$28,140, leaving \$154,202 for distribution amongst claimants, as follows: C.P.R., \$43,974; relatives of victims, \$110,128, in individual amounts from \$8,000 to \$3,000. All claims for personal loss were dismissed.

Discrepancies in Outturns of Grain Cargoes.—The Board of Grain Commissioners has again adopted for the current year the rules and regulations which were passed last year under the authority of the Dominion Parliament for the purpose of disposing of discrepancies and disputes in the outturn weights of grain cargoes. This renewal is in accordance with the Dominion Marine Association's recommendation, agreed to by the elevators, and discussed at a conference with the Commission at Montreal recently.

A combine of certain shipping and colliery interests, with a nominal capital of £100,000,000, is reported to have been completed in England, chiefly with the view of arranging mutual service and facilities, in order to make use of the maximum power of shipping and coal for the benefit of international customers at the close of the war.

The permitted draught of water through the Welland Canal has been increased from 14 ft. to 14 ft. 4 ins., in view of the present high levels. A similar increase has been asked for by the Dominion Marine Association for the St. Lawrence Canals, and the Marine Department has the matter under consideration.

The Great Lakes Transit Corporation, which was incorporated in the United States recent, to take over and operate a number of the lake steamships formerly owned by railway companies, which had been ordered to relinquish their interest in them, has filed its schedules of freight rates.

Progress of Toronto Harbor Work.

An official inspection of the Toronto harbor work was made June 13 by the acting Minister of Public Works, Hon. J. D. Reid, who was accompanied by the commissioners, members of the city council and a number of representative guests, who were much impressed with the satisfactory progress of the work. Leaving Yonge St. Wharf on one of the Toronto Ferry Co.'s steamboats the party went out through the new western entrance to the western end of the work, viewed the dredging on which three huge dredges, two of them rotary suction ones, were engaged; the land making work, the construction of crib work to provide a sheltered waterway from Humber Bay to the western entrance, and the preparations for boulevard and driveway construction. Returning through the same entrance they went east through the harbor to Ashbridge's Bay, where they disembarked and walked over a portion of the land which is being made for industrial sites, and on which several industries have been established already, viewed the 1400 ft. channel which is being made 400 ft. wide and 30 ft. deep, and the large turning basin at its eastern end, and on re-embarking went to the Royal Canadian Yacht Club on Centre Island, where they were entertained at luncheon.

Lionel H. Clarke, Chairman of the Commission, spoke enthusiastically of the successful way in which the work is being proceeded with and gave great credit to the Dominion Government for the liberal way in which it is assisting, it having given land worth over \$1,500,000 and only requiring in return the construction of a dock costing some \$75,000. He said that while the Commission's portion of the harbor work had been estimated to cost about \$5,000,000, it would be done for less than \$4,000,000, great savings having been found possible in the reclamation work. Over 230 acres of land have already been made. The commission have secured some 130 acres of water lots along the Bay front from Bathurst St. to Yonge St., without giving anything to the railway companies except undertaking to fill in their water lots to a common depth with those owned by the Commission and suitable for deep water vessels. He said that the work will undoubtedly be completed in three years. He warmly eulogized the Commission's Chief Engineer, E. L. Cousins, A.M. Can. Soc. C.E., and announced that following the resignation of the Secretary, A. C. Lewis, on undertaking military service, Mr. Cousins had also been appointed General Manager.

Government Aid to Shipbuilding in British Columbia.—In a recent discussion in the B.C. Legislature recently on the bill to aid shipbuilding in the province, it was decided that the number of vessels to be subsidized under the act be increased from 20 to 25. The matter of whether the bonus of \$5 a ton is to be figured on the registered tonnage or on the dead weight tonnage capacity was also discussed.

Asiatic Labor on Canadian Vessels.—The clause in the bill passed by the British Columbia Legislature recently to aid shipbuilding, which provided restrictions against the employment of any but white labor on any vessels coming under the act has been removed. It is stated that the Dominion Government intimated that the bill might be disallowed if a clause restricting Japanese labor were included.

Dominion Marine Association Appreciates Canadian Railway and Marine World.

Canadian Railway and Marine World has, in recognition of its service to the shipping interests, been appointed the Dominion Marine Association's official organ, as stated in the following letter, which is much appreciated by the publishers:

DOMINION MARINE ASSOCIATION. Executive Committee:

G. E. Fair, Toronto President.
A. E. Mathews, Toronto. . . 1st Vice President.
W. E. Burke, Montreal. . . 2nd Vice President.
H. W. Cowan, Toronto W. J. McCormack, Sault
L. Henderson, Montreal. . . Ste. Marie
D. Murphy, Ottawa. . . J. Playfair, Midland
W. L. Reed, Toronto. . . J. F. M. Stewart, Toronto
C. B. Harris, Toronto A. A. Wright, Toronto
Counsel Francis King, Kingston

Kingston, Ont., May 29, 1916.

Acton Burrows, Esq., Managing Director,
Canadian Railway and Marine World.

Dear Sir,—I have much pleasure in informing you that at a meeting of the Dominion Marine Association's Executive Committee in Toronto on the 26th inst., it was unanimously resolved:

"That in view of the thorough manner in which Canadian Railway and Marine World covers the marine field throughout Canada, the care which it exercises to secure accuracy, and the way in which its columns are freely at the Dominion Marine Association's disposal, it is hereby appointed the Association's official organ."

Yours truly,
FRANCIS KING,

Counsel, Dominion Marine Association.

Beeson's Marine Directory, for 1916 maintains the reputation attained by previous issues in the collection and notation of matter which is interesting as well as necessary to those whose business is concerned with navigation on the Great Lakes. In addition to the general information relating to vessels on the Canadian and U.S. registers, dry docks, shipbuilding and wrecking plants, etc., the resume of the details of lake traffic for the past year, is of exceptional interest, owing to the abnormal conditions existing on account of the war. This is the 30th year of publication, and the publisher announces that the next edition will be produced under the supervision of a committee of prominent vessel men who will choose, supply or approve its entire contents. The book consists of 288 pages, 10 by 7 ins., bound in cloth boards, and is published by Harvey C. Beeson, Chicago, Ill., at \$5.

Canada Steamship Lines' Dividends.—The directors announced, June 1, that a further payment of 1¼% will be made on Aug. 1 to shareholders of record on July 1, on account of deferred preference dividends. The announcement was made earlier than customary, as there are still a few remaining Richelieu and Ontario Navigation Co. shareholders who have not exchanged their holdings for C.S.L. scrip, and are therefore deprived of these payments. An opportunity is thus afforded them of making the transfer in time to participate in the payment to be made.

Longshoremen's Strike on Pacific Coast.—A strike of longshoremen at U.S. Pacific coast ports commenced June 1, the men demanding 55c an hour and \$1 an hour for overtime. The strike did not extend to British Columbia ports, the consequence being that a number of trans-Pacific vessels used B.C. ports considerably instead of U.S. ports.

Investigation Into the Grounding of the s.s. Rock Ferry.

In investigation into the grounding of the s.s. Rock Ferry on Main Duck Island, Lake Ontario, May 17, was held at Montreal, June 6 and 9, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. F. Nash and J. O. Grey, as nautical assessors. The court came to the conclusion that the master and mate both disregarded the most simple precautions in navigating the vessel. The master admitted that he kept full speed in a dense fog, and that no lookout was kept at any time. The fact that the vessel was floated off the rocks after two days, practically uninjured, does not palliate the offence. She is a wooden vessel, and had she been of iron, it is probable she would have been a total loss. In view of the good seamanship exercised by the master, A. Robineau, in getting the vessel off, the court exercised leniency, and suspended his certificate for two months from the time of the receipt of the certificate by the court, as it was not delivered at the time of the investigation. Regarding the mate, J. P. Dufour, the court found that he was left in full charge of the deck while the master had gone to rest, and it was his duty to reduce speed and place a lookout, and on feeling that he was near Main Duck Island, to have consulted the log which was apparently trailing, stop his vessel and take soundings if necessary, according to the rules, therefore the court found him equally to blame and suspended his certificate for two months from June 9.

Shipping employment offices have been opened at a number of lake ports recently, and the sailors' institutes at Kingston and Port Arthur have opened registers where both employers and employees may each make known their wants. These offices are under the Dominion Marine Association's auspices, and, in addition to these, Verity's Employment and Shipping Agency has been appointed to act in Toronto, and similar arrangements are being concluded at other lake ports. The facilities thus afforded should be of considerable benefit.

Grain Elevator for St. John, N.B.—In connection with the proposal to erect a Government grain elevator at St. John, F. P. Gutelius, General Manager, Canadian Government Railways, inspected three sites alongside the Government wharves there May 31. The site most favored is said to be on land now occupied by Harding's lumber yard, as from the location it is considered the conveyors could be fed better. If it is decided to proceed with the work, the cost will approximate \$1,000,000, and it will be urged that it be completed by Jan. 1.

The Plunkett Navigation Co., Ltd., has been incorporated under the Dominion Companies Act, with \$20,000 authorized capital and office at Cobourg, Ont., to own and operate steam and other vessels, and to carry on a general trading and navigation business. It is reported that the schooner, Charlie Marshall, owned by D. Plunkett and D. Rooney, Jr., Cobourg; the Ford River, owned by J. Richardson & Sons, Ltd., Kingston, and the Kee-watin, owned by Jas. Doherty, Belleville, have been acquired, and that these will be used for Atlantic coasting service. We have been unable to get any confirmation of this, and are advised that the Ford City is still being operated by J. Richardson & Sons Ltd.

Mainly About Marine People.

T. M. Nairn, formerly Superintendent, Donaldson Line, Montreal, died at Notre Dame de Grace, Que., June 6.

L. A. W. Doherty, Freight Traffic Manager, Canada Steamship Lines Ltd., made a business trip to the Pacific coast in June.

F. S. Isard, Comptroller, and **H. W. Cowan**, Operating Manager, Canada Steamship Lines, Ltd., are both going to build houses in Montreal.

Thos. Henry, heretofore Passenger Traffic Manager, Canada Steamship Lines, Ltd., has been appointed Superintendent of the Hotel Department. Office, Montreal.

E. L. Cousins, A.M.Can.Soc.C.E., heretofore Chief Engineer, Toronto Harbor Commission, has been appointed Chief Engineer and General Manager of the whole works.

F. H. Walker, of Walkerville, Ont., who died at Detroit, Mich., June 17, was associated with a number of local business concerns, among which is the Walkerville and Detroit Ferry Co.

Lieutenant **T. L. Harling**, who has died in Belgium from wounds received in action, was son of **R. D. Harling**, Toronto, Canadian representative of the Manchester Ship Canal Co. of England.

Capt. W. D. Shepherd, who was in command of the s.s. Empress of Fort William, which was sunk near Dover, Eng., early in the year, when going to the rescue of passengers and crew of the s.s. Maloja after she had been torpedoed, has been presented with a gold watch by her owners, the Peninsular and Oriental Steam Navigation Co.

Sir William Price, Chairman, Quebec Harbor Commissioners, has resigned, in order to devote more time to military duties. It is stated that the resignation of Commissioners Gravel and Letellier will be announced shortly. The names of **D. O. l'Esperance**, as Chairman, and **J. G. Scott**, formerly General Manager, Quebec and Lake St. John Ry., are mentioned in connection with the new commission.

James H. Mancor, who retired recently from the position of Principal Surveyor of Lloyd's Register of Shipping for the United States and Canada, was entertained to dinner at New York, at the end of May, by a number of friends connected with shipping and shipbuilding. He was presented with a silver tea and coffee service. Among those present was **G. T. Davie**, of **G. T. Davie & Sons, Ltd.**, shipbuilders, Levis, Que.

E. T. Stebbing, whose appointment as General Agent, Passenger Department, Trans-Pacific and Trans-Atlantic Lines, Canadian Pacific Ocean Services, Ltd., New York, was mentioned in our last issue, has been connected with the steamship and tourist business during his whole business life, having been, for about 20 years, with **Thos. Cook & Sons**, during the last seven of which he was Superintendent of their New York offices.

Capt. John Simpson, who died at Owen Sound, Ont., June 3, aged 91, was born near Belleville, Ont., and went to sea at 12 years old. He was for some time a master of sailing vessels on the Great Lakes, and learned shipbuilding at Oakville. He went to Owen Sound in 1874 to build the s.s. City of Owen Sound for **A. M. Smith & Co.** This vessel was equipped with the machinery from the s.s. City of London, which had been burned. In conjunction with some local people, he built at Owen Sound the first dry dock and shipbuilding plant above the Welland

Canal, and built many of the wooden vessels which navigated the Upper Lakes in the early days.

Navigation in the White Sea and Arctic Ocean.—The Russian Government, in consequence of the dangers in navigation due to the laying of mines in the White Sea and Arctic Ocean, announces that trading and merchant vessels, and all other types of vessel under any flag, except those which have received special permission, are prohibited from navigating in the White Sea and approaches thereto southward of a line joining Cape Kanin and Kharlov lighthouse, as well as in all waters of the Russian coasts of the Arctic Ocean within 12 miles of the coast line, rocks awash or off-lying islands. Vessels passing without permission into the prohibited areas are exposed to the danger of destruction by mines and are liable to be stopped by guardships for search and necessary orders. Vessels which have obtained permission to pass through the prohibited areas must observe all regulations. Permission for such navigation is arranged by the Director General of Arkhangel and the Jurisdiction of the White Sea.

Shipbuilding in Canada. At the Merchants Bank annual meeting in Montreal recently, General Manager **Hebden**, in the course of his remarks, said that shipbuilding, particularly steamship building, was a matter that required looking into. He compared facilities for building steel ships in Canada with those of the United States, much to the Dominion's benefit, saying that British Columbia had already begun the work and that such an industry would enable Canadians to make use of the wonderful resources of their country.

The American Society for Testing Materials held its annual meeting at Atlantic City, N.J., June 27 to 30, when various committee reports were dealt with.

Canada Steamship Lines Notes.

The s.s. Toronto arrived in Toronto at the end of May, after having been in the dry dock at Kingston, for a thorough overhaul. The interior furnishings have been completely transformed, and the decorations done in the various colors of the allies. She commenced her service on the Toronto-Charlotte-Prescott route, June 3.

The company is installing moving picture apparatus on its tourist vessels, for the amusement and instruction of passengers, and certain of the vessels will also be supplied with latest news of the war, etc., by wireless telegraphy. The pictures will chiefly be of scenes with which the company's steamships come in touch, and they will be shown on the upper deck in the evenings. The steamships Toronto and Kingston, running between Toronto, Charlotte and Prescott were equipped during June.

The s.s. William C. Moreland, the recovered wreck, which was purchased by the company a short while ago, was towed into Duluth recently. As mentioned in our last issue, the wreck was in such a condition that it was not possible to save the whole of her, she having broken in three pieces. The greater portion, the stern end, is in good condition, and it is stated that a new forward end is to be built on and the whole vessel overhauled and re-equipped. The recovered vessel was in charge of two tugs and, after being floated and bulkheaded, commenced her trip from Detroit, May 10, arriving at Duluth, May 21, after experiencing very rough weather.

Duluth, South Shore and Atlantic Ry. operators and agents have been granted increases in pay averaging a little over 10%, dating from June 1.

Grain in Store at Terminal Elevators, Interior Terminal Elevators and at Public Elevators in the East.

Week ending June 9, 1916.	Wheat. bushels.	Oats. bushels.	Barley. bushels.	Flax bushels.	Totals. bushels.
Port William—					
C.P.R.	1,916,250	501,214	90,648		2,508,112
Consolidated Elevator Co.	847,310	166,153	38,842	154,597	1,206,902
Empire Elevator Co.	1,145,793	304,186	46,276	191,627	1,687,882
Ogilvie Flour Mills Co.	1,179,476	101,877	33,752		1,315,105
Western Terminal Elevator Co.	947,844	186,612	14,849	226,220	1,375,525
G. T. Pacific	1,714,541	439,158	48,973	133,769	2,336,441
Grain Growers' Grain Co.	1,545,192	369,941	40,989		1,956,122
Port William Elevator Co.	407,665	272,412	52,626	26,212	758,915
Eastern Terminal Elevator Co.	583,425	195,545	30,318		809,288
Port Arthur—					
Port Arthur Elevator Co.	1,832,817	500,161	166,815	153,382	2,653,175
D. Horn & Co.	160,462	41,989	23,610	203,169	429,230
Dominion Government elevator.	1,550,411	451,539	57,790	92,017	2,151,817
Grain afloat.					
Total terminal elevators	13,831,186	3,530,847	645,488	1,180,993	19,188,514
Calgary Dom. Govt. Elev.	263,242	116,831	3,861		383,934
Saskatoon Dom. Govt. Elev.	1,289,222	383,647	23,794	86,471	1,783,134
Moose Jaw Dom. Govt. Elev.	1,152,048	199,976	19,953	44,449	1,416,426
Total interior terminal elevators	2,704,512	700,454	47,608	130,920	3,583,494
Depot Harbor—	366,125				366,125
Midland—					
Aberdeen Elevator Co.	556,493	108,920			665,413
Midland Elevator Co.	289,035	10,820			299,855
Tiffin, G.T.P.	1,063,614	787,838	229,494		2,080,946
Port McNicoll	541,019	1,592,099	81,670	14,267	2,229,055
Collingwood—					
Goderich Elevator & Transit Co.	743,345	165,791		15,400	924,536
Goderich, W.C., Flour Mills, Ltd.	152,150				152,150
Kingston—					
Montreal Transportation Co.					
Commercial Elevator Co.					
Port Colborne—	579,587	1,131,891	6,325	8,000	1,725,803
Prescott—					
Montreal—					
Harbor Commissioners no. 1.	635,853	1,036,895	178,997	44,408	1,896,153
Harbor Commissioners no. 2.	740,607	941,428	34,089		1,716,124
Montreal Warehousing Co.	598,467	824,524	308,210	4,735	1,636,936
Quebec Harbor Commissioners	706,633	130,836	12,519		849,988
West St. John, N.B.	383,446	1,680	3,341		388,467
Halifax, N.S.					
Total public elevators	7,356,374	6,732,722	754,645	86,810	14,930,551
Total quantity in store	23,892,072	10,964,023	1,447,741	1,398,723	37,702,559

Among the Express Companies.

F. Pearce, heretofore cashier, Canadian Northern Ex. Co., Saskatoon, Sask., has been appointed agent at Elrose, Sask.

The Canadian Ex. Co. has opened an office at Camp Borden, the military camp near Angus, Ont., with A. E. Stone as agent.

A. E. Stone has been appointed agent, Canadian Ex. Co. at Camp Borden, the Dominion Government military camp established recently near Angus, Ont.

The Dominion Ex. Co. has opened offices at Blumenhof, Cantaur, Estuary, Kirriemuir, Loyalist, Regina Beach and Supurb, Sask.

The Canadian Northern Ex. Co. has opened offices at St. Norbert, Que.; Gogoma, Kashbaw, Longuelac and Ruel, Ont.; Ericksdale, Man.; Birdview, Mervin and Richlea, Sask., and Excel, Lavoy and Stanmore, Alta.

The Association of Express Accountants, at its annual convention at Chattanooga, Tenn., recently, elected H. A. Kropp, General Auditor, Southern Ex. Co., President for the current year, and R. Mundle, Comptroller, American Ex. Co., Vice President. It was decided to hold the next annual convention at Toronto. Among the Canadian members of the association, are, W. W. Williamson, General Auditor, and W. H. Bryce, Superintendent Money Orders, Canadian Ex. Co., Montreal; W. H. Plant, General Auditor; D. Barron, Auditor of Transportation; C. E. Foote, Auditor of Receipts, and H. H. Wheeler, Auditor Money Orders, Dominion Ex. Co., Toronto.

The United States Ex. Co., in liquidation, has made a further payment of \$15 a share, thus totalling payments of about 40% since the commencement of the liquidations. The first payment was \$25 a share, and it is expected that a third payment will be made before the end of this year. D. E. Roberts, formerly General Manager, Quebec, Montreal & Southern Ry. and Napierville Jct. Ry., Montreal, is the liquidator. He stated recently that none of the company's assets would be sold at a loss, and though some of those connected with the proceedings are anxious for a speedy closing of the accounts, it has been decided to adhere to that policy, and not to hurry things unduly.

Transportation Conventions in 1916.

- Aug. 15-17.—International Railroad Blacksmiths' Association, Chicago, Ill.
- Aug. 16 to 18.—American Association of Railroad Superintendents, Memphis, Tenn.
- Aug. 24-26.—American Railway Tool Foremen's Association, Chicago, Ill.
- August 29.—International Railway General Foremen's Association, Chicago, Ill.
- Sept. 5 to 8.—Traveling Engineers' Association, Chicago, Ill.
- Sept. 12-14.—Master Car and Locomotive Painters' Association of United States and Canada, Atlantic City, N.Y.
- Sept. 12-14.—Railway Signal Association, Mackinac Island, Mich.
- Sept. 19-22.—Roadmasters and Maintenance of Way Association, New York.
- October 3-5.—Railway Fire Protection Association, New York.
- Oct. 9-13.—American Electric Railway Association, Atlantic City, N.J.
- October 10.—Association of Manufacturers of Chilled Car Wheels, New York.
- Oct. 17, 18.—American Association of Passenger Traffic Officers, Washington, D.C.
- October 17-19.—American Railway Bridge and Building Association, New Orleans, La.
- October 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Philadelphia, Pa.
- Oct. 18-20.—Society of Railway Financial Officers, Washington, D.C.
- Oct. 19-21.—American Association of Dining Car Superintendents, New Orleans, La.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Standard Underground Cable Co. of Canada, Ltd., has removed its Montreal branch office to the McGill Building, from the New Birks Building.

B. J. Arnold, of the Arnold Co., Chicago, Ill., has been engaged by the Rochester, N.Y., Chamber of Commerce to survey and report on the needs of the city regarding local transportation facilities.

M. Beatty & Sons Ltd., Welland, Ont., have received an order from the St. Maurice Construction Co. for an 8 x 12 triple drum hoisting engine with boom swinger, and for a 37 h.p. double firm electric hoist, for use on construction of the St. Maurice River dam near Sanmaur, Que.

Roberts & Schaefer Co., engineers and contractors, Chicago, have issued bulletin 31, 8 pages, 9 x 11½ in. describing and illustrating Rands measuring coal loader for locomotives, patent for which has been applied for.

M. Beatty & Sons, Ltd., Welland, Ont., have received an order from the Dominion Bridge Co. for two 9 x 12 link motion hoisting engines, with cut steel gears, and two 60 x 156 in. vertical boilers, to be built under Ontario inspection, for use on the Canadian Government Railways car ferry terminals at Carleton Point, P.E.I., and Cape Tormentine, N.B.

The Du Pont Fabrikoid Co., Wilmington Del., and Toronto, has issued a booklet, Du Pont Fabrikoid Book Finish, dealing with its artificial leather, which has proved especially satisfactory for railway car, automobile and furniture upholstery, and is being extensively used for book binding. The company claims that "some of its advantages and features are, that it has the leather effect in any grain or color, and costs less, comes in rolls and thus eliminates waste in cutting, no unused corners or edges. It has just the needed degree of pliability, not too soft to work well in a case-making machine, nor too hard to stand the bending of the joints. It is waterproof and washable. This is a strong point, for books naturally get dirty, but if bound in Fabrikoid the covers can be washed. Besides it is vermin proof, and cannot be destroyed in that manner."

Transportation Associations, Clubs, Etc.

- The names of persons given below are those of the secretaries unless otherwise stated:
- Canadian Car Service Bureau—J. Reilly, Manager, 401 St. Nicholas Building, Montreal.
- Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.
- Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.
- Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.
- Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.
- Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.
- Canadian Ticket Agents' Associations—E. de la Hooke, London, Ont.
- Dominion Marine Association—F. King, Counsel, Kingston, Ont.

- Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.
- Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.
- Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.
- Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.
- Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.
- Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.
- International Water Lines Passenger Association—M. R. Nelson, New York.
- Niagara Frontier Summer Rate Committee—James Morrison, Montreal.
- Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.
- Quebec Transportation Club—A. F. Dion, Quebec.
- Shipping Federation of Canada—Thos. Robb, Manager, 42 St. Sacramento Street, Montreal.
- Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.
- Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.
- Transportation Club of Vancouver—H. A. Schofield, 589 Granville St., Vancouver, B.C.
- Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.
- Western Canada Railway Club—Louis Kon, Box 1707 Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.
- Winnipeg Traffic Club—James Gehrey, Bannatyne Avenue, Winnipeg, Man.

NOTICE.

Re. Canadian Patent No. 156,598, of June 30, 1914, on Furnace Grates.

The undersigned is ready and willing to negotiate with all persons desiring to manufacture under the above patent in Canada.

Marcus E. Hansell,

c/o Canadian Railway and Marine World, 70 Bond Street, Toronto.

CANADIAN GOVERNMENT RAILWAYS.

TENDERS.

SEALED TENDERS, addressed to J. W. Pugsley, Secretary, Department of Railways and Canals, Ottawa, Ont., and marked on the outside "Tender for Elevator Foundations, Transcona," will be received up to and including Twelve O'Clock Noon, Tuesday, July the 4th, 1916, for the construction of reinforced concrete foundations on wood piles or concrete piles, for 1,000,000 bushel storage capacity Grain Elevator, Working House and Track Shed at Transcona, Manitoba; separate tenders to be submitted for the foundations with concrete piles and foundations with wooden piles, and tenders may be submitted on either or both designs.

Plans, Specifications and blank form of contract may be seen at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, at the Office of the Chief Engineer, Moncton, N. B.; at the Office of the General Superintendent, Winnipeg, Manitoba; at the Office of the Resident Engineer, Fort William, Ont.; and at the Office of the J. S. Metcalf Co., Ltd., Engineers, Montreal, P. Q.

All the conditions of the Specifications and Contract form must be complied with.

Tenders must be put in on the blank form of tender, which may be obtained from any of the offices at which plans are on exhibition. Each tender must be accompanied by a certified bank cheque, payable to the Honourable the Minister of Railways and Canals, for the sum of \$15,000.00.

The lowest or any tender not necessarily accepted.

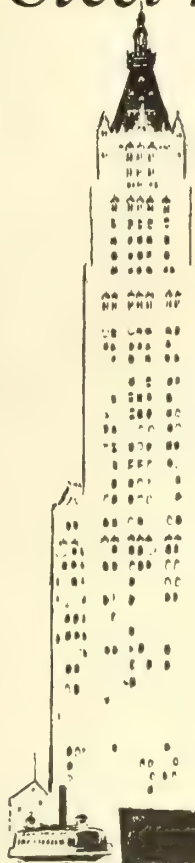
F. P. GUTELIUS,

General Manager,

Canadian Government Railways.

Dated at Moncton, N.B.,
June 17th, 1916.

Steel need not rust!



Technical men know this, of course—but judging by the size of the junk heaps each year in this country alone, the fact is thrust upon us that Steel Does Rust.

But it need not. Not since the invention of

TOCKOLITH

THE PATENTED CEMENT PAINT

Since 1848 the great scientific laboratories of Toch Brothers, with all the skill, craftsmanship and resourcefulness at their command, have been arrayed against rust, the enemy of steel, iron and other metal. And they have conquered it absolutely.

Their great preservatives, Tockolith and R. I. W., have been used 'round the world, and are specified continually by leading architects and engineers.

Ask for THE RED BOOK. Please address Dept. 56.

R.I.W.
REMEMBER ITS WATERPROOF

DAMP-RESISTING PAINT

Manufactured in Canada by
**R.I.W. DAMP-RESISTING
PAINT CO.**

TOCH BROTHERS
Gerrard St. and Carlaw Ave.
TORONTO, ONT., CANADA



Electric Railway Supplies

Detroit Controller Checks.
Peerless Check Valves.
Hollis Safety Fender.
Bakalite Arch-leaves, Brush holders
Yokes and Rods.
Bakalite Washers and Asbestos
Board.
Gongs, Bells and Air Whistles.

Allen General Supplies, Ltd.
205 Yonge Street Toronto

IMPERIAL BANK OF CANADA

Capital Authorized.....\$10,000,000
Capital Paid up.....7,000,000
Reserve Fund.....7,000,000

Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the World.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.

Consolidated

600 volt—Switches—1800 volt

ARE

MECHANICALLY AND ELECTRICALLY
CORRECT

Write us for further information.

Consolidated Car-Heating Co.

New York — Albany — Chicago

DAWSON & CO., AGENTS
148 McGill Street, MONTREAL, QUEBEC.

FOR TICKET CASES AND COMMERCIAL FURNITURE

of all descriptions to stock
or special design, apply to

The Canadian Office and School Furniture Co.,
Limited
Preston - Ontario

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Celebrated Wheel Truing Brake Shoe
Best Wheel Grinders in the World

VESSEL FOR SALE.

Steel hull former side-wheel passenger steamer "Picton," in first class condition; hold clear and decked over; all machinery removed; carrying capacity approximately 600 tons. Length 190 ft.; breadth moulded 28 ft.; depth moulded 13 ft.; draught forward 7 ft.; draught aft 8 ft. Apply Lake Simcoe Ice Supply Co., Limited, Toronto.

Ramapo Automatic Safety Switch Stands 4 Styles for Every Purpose

Increased demand for Ramapo Switch Stands demonstrates their ability to give the best service with the lowest cost of maintainance.

**Canadian Ramapo Iron
Works, Limited**

Niagara Falls - Ontario



Style No. 17

Dominion Iron & Wrecking Company

LIMITED

Railway Equipment, Rails and Machinery

Dismantlers of BRIDGES, PLANTS, STEAMERS, MILLS
Dealers in IRON, STEEL, SCRAP METALS

General Offices: Transportation Building
TORONTO

QUEBEC

MONTREAL, QUE.
ST. JOHN, N.B.

Are You in the Market for Trolley Catchers, Retrievers, Bases or Head Lights

We manufacture Knutson No. 5 Trolley Retriever, Knutson No. 2 Trolley Retriever, The Ideal Trolley Catcher, The Simplex Trolley Base, The Peerless No. 10 Roller-bearing Trolley Base, The Peerless Check Valve, The Peerless Junior Head Light, The Perfect Head Light, The Hollis Safety Fender, No. 3 Detachable Fender.

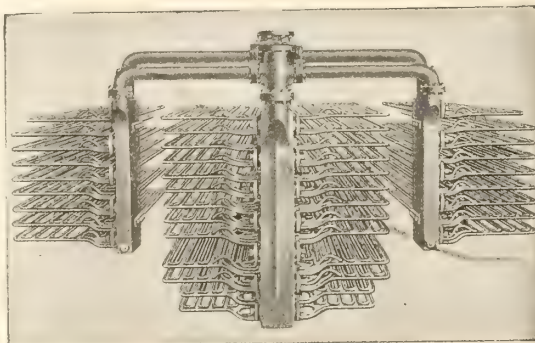
Write our Canadian Representatives Allen General Supplies, Limited they will be pleased to give you complete information as to any of the above as well as our other lines.

Trolley Supply Company, Canton, Ohio

Address all correspondence to Allen General Supplies, Limited, 205 Yonge St., Toronto

Fire Tube Marine Superheater -- Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler h.p. from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.

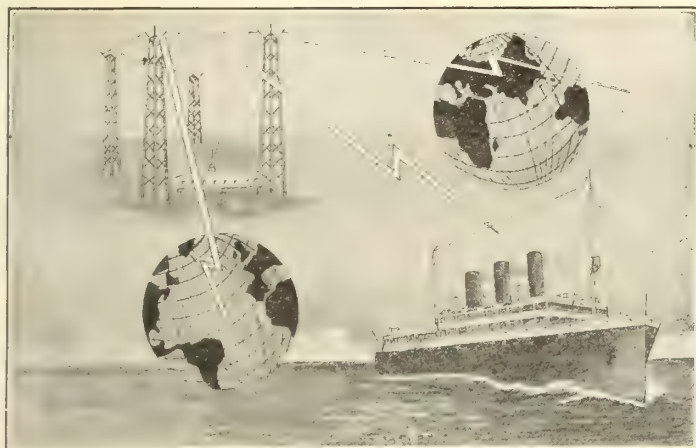


5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, New York, N.Y.

Peoples Gas Bldg., Chicago, Ill.



MADE IN CANADA

Marconi Wireless Telegraph Apparatus

Ship sets suitable for liners, yachts, tugs, freighters and scows our speciality.

Have you considered the advantage of connecting up factory or mine to head office by wireless? We will sell or rent you a system to cover all your requirements.

Of the world's wireless stations 80% are **Marconi**.

Consult: "**Marconi**" the World-Wide Wireless

Canadian Marconi Company

Head Office, 137 McGill St., Montreal

The Canadian Bridge Co., Limited

Walkerville, Ontario

Locomotive
Turntables
Roofs
Steel Buildings

Manufacturers of

Railway and Highway
BRIDGES

Structural
Iron Work
of all
Descriptions



Showing the construction of our geared jacks.

Celebrated "H & E" Lifting Jack

Our Patent Ball-Bearing Geared Jacks are Ideal in Railroad and Heavy Construction Work.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

SHERBROOKE, QUE.

Sole Agents for Brakeshoes for Canada outside of B.C., Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for B.C., The B.C. Equipment Co., Vancouver, B.C. Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.

High Grade Electric
STEEL CASTINGS
MANGANESE STEEL
For Crusher Jaws and Heavy
Wear Parts

BRONZE

M.C.B. Standard Journal Bearings and Engine Bearings

Improved Reinforced Steel-Backed

BRAKESHOOES

Locomotive Driver and Truck Shoes. Freight and Passenger Car and Electric Car Shoes.

The Preston Car & Coach Co., Limited

Preston, Ont.

Manufacturers of

Steam and Electric
Railway Cars and
Special Cars.

CHICAGO CAR HEATING CO.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES

Canadian Factory and Office—61 Dalhousie St., Montreal A. D. BRUCE, Agent

GENERAL OFFICES:
RAILWAY EXCHANGE, CHICAGO, U.S.A.
NEW YORK, GRAND CENTRAL TERMINAL BLDG.
ATLANTA GA., CANDLER BLDG.
WASHINGTON, D.C., MUNSEY BLDG.

C. W. Sherman, Pres. and Gen. Mgr.

F. W. Ballie, Vice-Pres.

A. G. Wright, Secy.

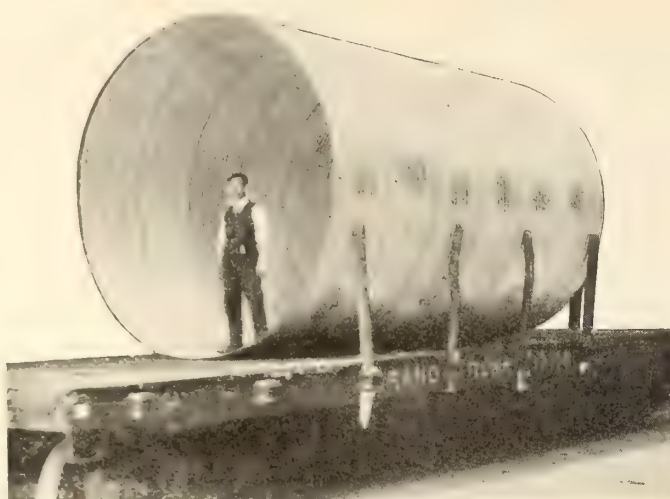
Dominion Steel Foundry Company, Limited, Hamilton, Ont.

Locomotive Frames

Car Bolsters

Car Castings

Heavy Machinery Castings



No Hill Too Steep No Fill Too Deep

Every Engineering difficulty is approached with eager efficiency when Pedlar's Culverts are at your disposal. Steep hills, deep fills, resiliency, wear, durability, lighter time and labor costs.

Pedlar's "Perfect" TONGAN METAL Culverts

come to you in sizes and weights to suit any requirements. Stock sizes up to 84 inches, and in lengths up to 40 feet, ready to roll into position. If unusual lengths are required, coupling bands are provided free for joining up sections. The **TONGAN** of which they are made cannot rust, rot or corrode, nor crack from frost or expansion. You should certainly have the valuable data and drainage tables contained in the free Culvert Reference Book R. M. Tell us to-day where to send it.

THE PEDLAR PEOPLE, Limited

(ESTABLISHED 1861)

Executive Office and Factories, OSHAWA, ONT.

Branches: MONTREAL, OTTAWA, TORONTO, LONDON, WINNIPEG



NICKEL

Shot—High and low carbon.

Ingots—Two sizes, 25 lbs., 50 lbs.

Electrolytic Nickel—99.80 p.c.

Prime Metals for the Manufacture of Nickel Steel, German Silver, Anodes and all remelting purposes. Our Nickel is produced as Rods, Sheets, Strip Stock, Wire and Tubes.

We are SOLE PRODUCERS of this natural stronger-than-steel, non-corrodible alloy. Manufactured forms are Rods, Flats, Castings, Tubes, Sheets, Strip Stock and Wire.

Send Inquiries Direct to Us.

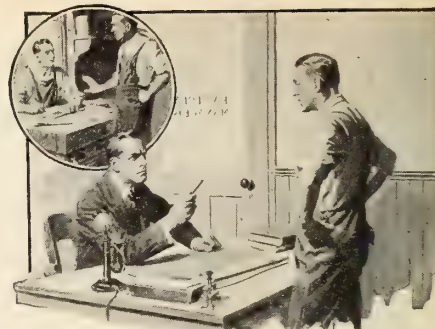
The International Nickel Co., 43 Exchange Place, N.Y.

MONEL
METAL
Reg. U.S. Pat. Off.

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. BABBITTS. Miscellaneous Brass Castings for Railroads.

Works and Office: 69 Delorimier Avenue, MONTREAL, QUE.



**"Don't tell me
you never had a chance!"**

"Four years ago you and I worked at the same bench. I realized that to get ahead I needed special training, and decided to let the International Correspondence Schools help me. I wanted you to do the same, but you said, 'Aw, forget it!' You had the same chance I had, but you turned it down. No, Jim, you can't expect more money until you've trained yourself to handle bigger work."

There are lots of "Jims" in the world—in stores, factories, offices, everywhere. Are you one of them? Wake up! Every time you see an I. C. S. coupon your chance is staring you in the face. Don't turn it down.

Right now over one hundred thousand men are preparing themselves for bigger jobs and better pay through I. C. S. courses.

You can join them and get in line for promotion. Mark and mail this coupon, and find out how.

I. C. S., Box 8406, Scranton, Pa.

INTERNATIONAL CORRESPONDENCE SCHOOLS Box 8406, SCRANTON, PA.

Explain, without obligating me, how I can qualify for the position, or in the subject, before which I mark X.

- | | |
|---|---|
| <input type="checkbox"/> Locomotive Engineer | <input type="checkbox"/> R. R. Agency Accounting |
| <input type="checkbox"/> Locomotive Fireman | <input type="checkbox"/> R. R. Genl. Office Acct'g |
| <input type="checkbox"/> Travelling Engineer | <input type="checkbox"/> Bookkeeper |
| <input type="checkbox"/> Travelling Fireman | <input type="checkbox"/> Stenographer and Typist |
| <input type="checkbox"/> Air Brake Inspector | <input type="checkbox"/> Higher Accounting |
| <input type="checkbox"/> Air Brake Repairman | <input type="checkbox"/> Mathematics |
| <input type="checkbox"/> Round House Foreman | <input type="checkbox"/> Good English |
| <input type="checkbox"/> Trialmen and Carmen | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> Railway Conductor | <input type="checkbox"/> Advertising Man |
| <input type="checkbox"/> Mechanical Engineer | <input type="checkbox"/> Civil Service |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> Railway Mail Clerk |
| <input type="checkbox"/> Machine Shop Practice | <input type="checkbox"/> Electrical Engineer |
| <input type="checkbox"/> Boiler Maker or Designer | <input type="checkbox"/> Electrician |
| <input type="checkbox"/> Steam Engineer | <input type="checkbox"/> Electric Wiring |
| <input type="checkbox"/> Steam-Electric Engineer | <input type="checkbox"/> Electric Lighting |
| <input type="checkbox"/> Civil Engineer | <input type="checkbox"/> Telegraph Expert |
| <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> Mine Foreman or Engineer |
| <input type="checkbox"/> R. R. Constructing | <input type="checkbox"/> Metallurgist or Prospector |
| <input type="checkbox"/> Bridge Engineer | <input type="checkbox"/> Chemical Engineer |
| <input type="checkbox"/> Architect | <input type="checkbox"/> Agriculture |
| <input type="checkbox"/> Architectural Draftsman | <input type="checkbox"/> Poultry Raising |
| <input type="checkbox"/> Contractor and Builder | <input type="checkbox"/> German |
| <input type="checkbox"/> Structural Engineer | <input type="checkbox"/> Automobiles |
| | <input type="checkbox"/> French |
| | <input type="checkbox"/> Auto Repairing |
| | <input type="checkbox"/> Italian |

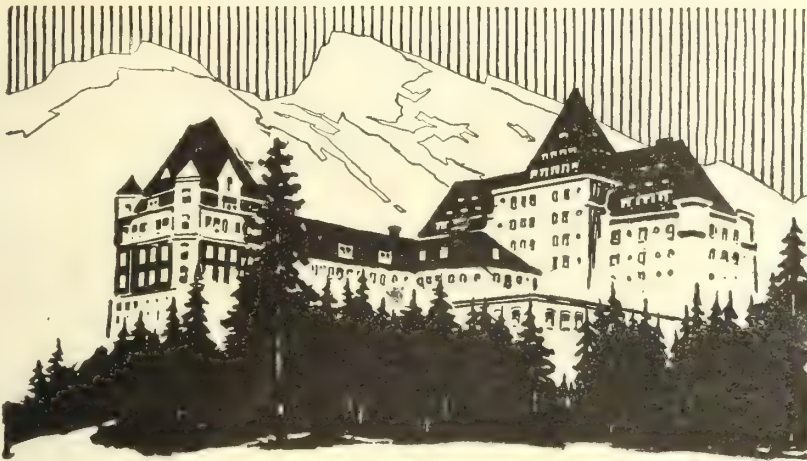
Name _____

Occupation & Employer _____

Street and No. _____

City _____ State _____

If name of Course you want is not in this list, write it below.



Minarets and Mountain Peaks

at luxurious Banff—in the very heart of the

Canadian Pacific Rockies

At Banff are all the fine touches of social life, good table, good service, every possible comfort at moderate cost. From the stone pillared verandah or from the wide windows of the hotel, lies spread the great panorama of Alps and river.

Reached only by the world's greatest transportation system—the

Canadian Pacific Railway

which maintains hotels at Banff, Lake Louise, Field, Glacier, Balfour.

Everything Canadian Pacific Standard—None Better.

For further information apply to any Canadian Pacific Ticket Agent or W. B. Howard, District Passenger Agent, Toronto.



ENAMELED IRON SIGNS

The ideal signs for
Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.

We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc,

Guaranteed not to
fade or be affected
by the weather in
any way.

Acton Burrows
Limited

Enameled Iron Signs

70 Bond Street - Toronto

The Ottawa Car Manufacturing Co., Limited

Builders of

Electric Cars, Snow
Sweepers and Plows

Also

Producers of Brass
Castings of Every
Description.

Slater Street - Ottawa

Rails, Cars, Locomotives

and Contractors' Equipment

IMMEDIATE
SHIPMENT

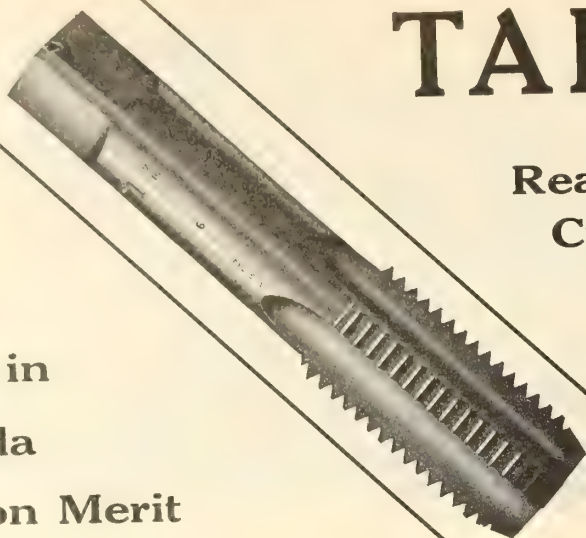
John J. Gartshore

58 Front St. West
TORONTO

TAPS

Reamers
Cutters
Drills
Dies

Made in
Canada
Sold on Merit



Ask for our new catalogue No. 8

Pratt & Whitney Co.
of Canada, Limited

DUNDAS

ONTARIO

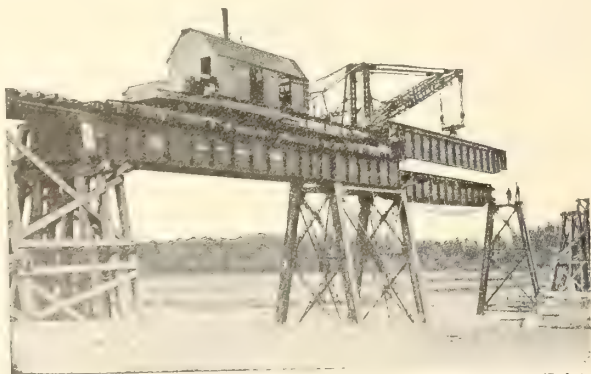
Montreal

Vancouver

Winnipeg

"BEATTY" HOISTS

For situation where the work is severe and the service exacting—"a Beatty always fills the bill"



Derrick car engined with an 8 x 12 four drum Beatty Hoist placing an 80 foot deck plate girder span in Skugog River Bridge.

Let us know your requirements for
Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

We will gladly send full information.

M. Beatty & Sons Limited - Welland

Toronto Office—Goodyear Bldg. Telephone Adelaide 208.

Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg, Winnipeg.

STANDARD Wires and Cables

Wire Rods,
Bare Copper Wire,
Brass and Bronze Wires,
Standard C.C.C. Wire,
(Colonial Copper Clad)
Magnet Wire,
Weatherproof Wire,
Rubber Insulated Wires,
Varnished Cambric Cable,
Fibre Lead-Covered Cable,
Paper Lead-Covered Cable,
Rubber Lead-Covered Cable,
Armored Cable,

and Cable Accessories

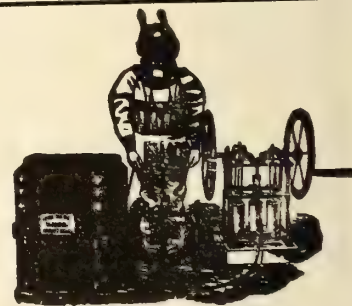
Cable Terminals,
Cable Junction Boxes,
"Ozite" Insulating Compounds,
Miscellaneous Cable Accessories of
all Kinds,
Cable Installations.

For detailed information, samples, estimates or prices, write our nearest office.

Standard Underground Cable Co.
of Canada, Limited

HAMILTON, ONT.

Montreal, Que. Seattle, Wash.
Winnipeg, Man.



JOHN DATE

Manufacturer of

Diving Apparatus

For Sale or Hire

Brass Founder and Coppersmith
13-15 Concord St., Montreal

**John Morrow Screw & Nut Co.,
Limited.**

BUSINESS AS USUAL

Set Screws
Cap Screws
Nuts, every variety
of finish
Twist Drills, etc.

Customers are requested to place their specifications with us as far ahead of their actual needs as possible so that we may give them good service.

INGERSOLL - ONTARIO

Engineers and Contractors

Locomotive COALING STATIONS
ROBERTS AND SCHAEFER CO.
ENGINEERS AND CONTRACTORS
 CHICAGO, U.S.A.

Edward F. Terry President
 Frederick Tench V. P. & Treas.
The TERRY & TENCH CO., Inc.
Bridge Builders
 General Contractors, Engineers and Designers
 Grand Central Terminal NEW YORK

THE ARNOLD COMPANY
 ENGINEERS—CONSTRUCTORS.
 ELECTRICAL—CIVIL—MECHANICAL
 REPORTS, DESIGN AND CONSTRUCTION
 Complete Railway Shop and Terminal Properties—
 Electrification of Steam Railroads.
 OUR EXPERIENCE COVERS THIRTY-FIVE PLANTS
 Chicago, Illinois.

ANGUS SINCLAIR, C.E.
Railway Contractor
 Office: Imperial Bank Building,
 King and Sherbourne Sts., Toronto.

JACOBS & DAVIES, Inc.
 Consulting Engineers
 MONTREAL LONDON NEW YORK
 Foundations, Subaqueous and Land Tunnels, Subways, Railways, Harbours, Waterpower Development, Examinations, Reports.
 Montreal Office: Eastern Townships Bank Building

Patent Solicitors

PATENTS SECURED OR OUR FEES RETURNED.
 Being next door to the Patent Office; we have personal interviews with Examiners, thus earlier allowance of your Patents. We have access to all Records and solicit the business of Manufacturers, Engineers and others who realize the advisability of having their Patent business transacted by Experts.
HAROLD C. SHIPMAN & CO.
 Reg. Patent Attorneys. Ottawa, Canada

VAN-HALLEN & O'NEIL
 REGISTERED ATTORNEYS
 at Washington and Solicitors of Canadian and Foreign Patents, Copyrights, Trade Marks, Searches.
 Head Office, 103 Farmer Building, 333 Main Street.
 WINNIPEG, MAN., Canada

PATENTS
HERBERT J. S. DENNISON
 Mechanical Engineer, Patent Attorney and Expert.
 Patents, Trade Marks, Designs, Copyrights, and Infringements. 20 Years experience in Patents and Practical Engineering.
 Star Building, 18 King Street West, Toronto
 WRITE FOR BOOKLET.

Dominion Bridge Company, Limited

Head Office and Works,
 MONTREAL, P.Q.

Branch Offices and Works,
 TORONTO, OTTAWA and WINNIPEG



Lachine Bridge

Engineers, Manufacturers and Erectors of Steel Structures.
 CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

Large Stock of Standard Structural Material at all Works.

ROBERT W. HUNT
 THOS. C. IRVING JR.

CHARLES WARNOCK
 JAS. W. MOFFAT

Robert W. Hunt & Co., Limited

**Consulting and Inspecting Engineers
 Chemists and Metallurgists**

Expert examination and tests of all steel and metal products; Bridges, Buildings, Cement; Electrical and Mechanical Plant Equipment; Rails and Fastenings; Cars; Locomotives; Pipe; Castings; Forgings; Lumber; Paving Materials.

Resident inspectors at all important manufacturing centres in Canada, the United States and Great Britain.

REPORTS ON PROPERTIES AND PROCESSES.

Head Office and Laboratories:

McGill Building, - - - MONTREAL, QUE.

Branches: TORONTO VANCOUVER LONDON, ENGLAND

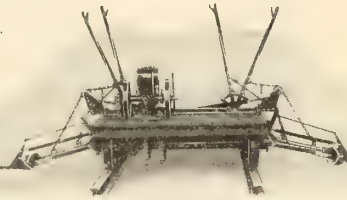
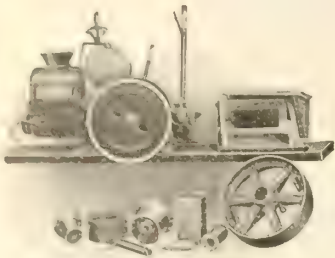
Complete Hydraulic Equipment

For Railway and Shipbuilding Plants

Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc. Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast Iron Pipe, Hydrants, Valves and Fittings, etc.

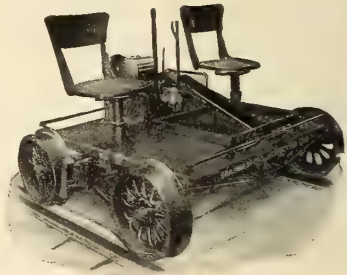
R. D. WOOD & CO. Philadelphia, Pa.

FAIRMONT WINS GOLD MEDAL



The excellence of FAIRMONT Railway Motor Cars is attested by their receiving the highest competitive award, a gold medal, at the Panama-Pacific International Exposition, San Francisco.

Years of good service on Canadian railroads has proven the justice of this award. When you need a motor car, specify "FAIRMONT". Instalment terms to private buyers.



FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

Formerly Fairmont Machine Co.

445 N. MAIN ST., FAIRMONT, MINNESOTA, U.S.A.

Flange Lubrication Should be Automatic

Flange lubrication to be efficient should be automatic, absolutely independent of your engineer, and at the same time the device itself should be so simple and yet so accurate that it will be practically trouble proof. The

Detroit Automatic Flange Lubricator (Pendulum Type)

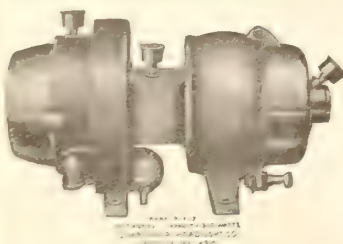
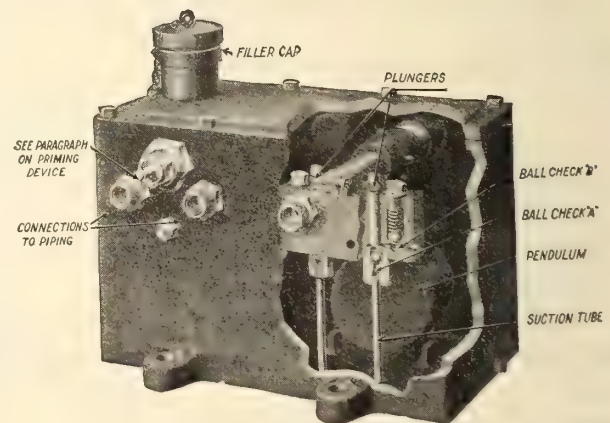
is absolutely automatic and at the same time simple. It is all in the pendulum. Any lateral movement of the locomotive causes the pendulum to swing. This oscillation rotates, rocker-like, the pendulum shaft, which produces alternating strokes of the two plungers in the pumping unit.

The use of the Detroit Automatic Flange Lubricator insures positive lubrication just when it is needed. May we send booklet F-O 81? It contains all the facts as well as drawings. Write to-day.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.

WALKERVILLE, ONT.

Canadian Sales Agents: Taylor & Arnold, Ltd., Montreal.



70 Schroeder Incandescent Headlights

In Service

270 days without any expense for repairs.
As a result of this exceptional service
150 more have just been ordered.

The HIRAM L. PIPER CO., Limited

MONTREAL, Sole Agents for Canada

It Pays to carry an advertisement in the Canadian Railway and Marine World every issue of the year because you obtain proportionately better **Results**

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies.

- ACETYLENE**
Commercial Acetylene Ry., Lt. & Sig. Co.
- AERATED WATERS**
E. L. Drewry
- AIR BRAKES AND FITTINGS**
Canadian Westinghouse Co.
- ALES**
E. L. Drewry
- ANGLE BARS**
Steel Co. of Canada
- AUTOMOBILES**
Preston Car & Coach Co.
- AXLES**
Nova Scotia Steel and Coal Co.
Jas. W. Pyke & Co.
Steel Co. of Canada.
- BATTERIES, DRY**
Canadian National Carbon Co.
- BATTERIES, SIGNAL**
Canadian National Carbon Co.
- BATTERIES, STORAGE**
Canadian National Carbon Co.
- BATTERIES, TRACK**
Canadian National Carbon Co.
- BATTERY SUPPLIES**
Canadian National Carbon Co.
- BOILER COMPOUND**
Dearborn Chemical Co. of Canada
- BOILERS**
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works
- BOILERS, PORTABLE**
Polson Iron Works
- BOILERS, STATIONARY AND MARINE**
Polson Iron Works
- BOILERS, STEAM**
Polson Iron Works
- BOILERS, WATER TUBE**
Babcock & Wilcox
Polson Iron Works
- BOLTS AND NUTS**
Steel Co. of Canada
- BOLTS, TRACK**
F. H. Hopkins & Co.
Nova Scotia Steel & Coal Co.
Steel Co. of Canada
- BORERS, CAR WHEEL**
John Bertram & Sons Co.
Canada Machinery Corporation
- BRAKE BEAMS**
Buffalo Brake Beam Co.
- BRAKE SHOES**
Canada Iron Foundries
Canadian Brakeshoe Co.
Dominion Brakeshoe Co.
- BRAKE SHOES, LOCOMOTIVE DRIVER**
Canada Iron Foundries
- BRIDGE BUILDERS**
Terry & Tench Co.
- BRIDGE NUMBERS**
Acton Burrows, Limited
- BRIDGES**
Canadian Bridge Co.
Dominion Bridge Co.
- BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION**
Canadian National Carbon Co.
- BUCKETS, COAL, ORE AND CONCRETE**
M. Beatty & Sons
Brown Hoisting Machinery Co.
F. H. Hopkins & Co.
- BUILDINGS, STEEL**
Canadian Bridge Co.
Dominion Bridge Co.
- BUMPING POSTS**
F. H. Hopkins & Co.
- CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED**
Standard Und. Cable Co. of Can.
- CARBONS, ARC LAMP, FLARE ARC AND PHOTOGRAPHIC**
Canadian National Carbon Co.
- CARBON SPECIALTIES**
Canadian National Carbon Co.
- CAR CLEANER**
Allen General Supplies, Ltd.
- CAR SIGNAL SYSTEMS**
Ohio Brass Co.
- CARS**
Hart-Otis Car Co.
National Steel Car Co.
Ottawa Car Mfg. Co.
Preston Car & Coach Co.
- CASTINGS, BRASS**
Canada Iron Foundries
Canadian Bronze, Limited
- CASTINGS, CAR**
Canada Iron Foundries
Dominion Brakeshoe Co.
- CASTINGS, IRON**
Canada Iron Foundries
Hunt-Spiller Manufacturing Corp.
- CASTINGS, IRON AND STEEL**
Dominion Brakeshoe Co.
Dominion Steel Foundry Co.
- CASTINGS, MALLEABLE**
Taylor & Arnold
- CASTINGS, MANGANESE STEEL**
Canadian Steel Foundries, Ltd.
- CASTINGS, STEEL**
Dominion Steel Foundry
- CATENARY MATERIALS**
Ohio Brass Co.
- CHAINS**
B. J. Coghlin Co.
F. H. Hopkins & Co.
- CLOSETS, CAR**
Duner Co.
- COAL**
Nova Scotia Steel and Coal Co.
- COAL CHUTES**
Roberts & Schaefer Co.
- COAL DOCK BRIDGES**
Roberts & Schaefer Co.
- COAL MINING AND WASHING PLANTS**
Roberts & Schaefer Co.
- COALING STATIONS**
Roberts & Schaefer Co.
- COMPRESSORS, AIR**
Canadian Ingersoll-Rand Co.
F. H. Hopkins & Co.
- CONCRETE MIXERS & ROCK CRUSHERS**
F. H. Hopkins & Co.
- CONTRACTORS' SUPPLIES**
F. H. Hopkins & Co.
Rice Lewis & Sons
- CONVEYORS, COAL AND ASH**
Babcock & Wilcox
- COPPER, RODS AND WIRE**
Standard Und. Cable Co. of Can.
- COUPLERS, CAR & LOCOMOTIVE**
Canadian Steel Foundries, Ltd.
Ohio Brass Co.
Taylor & Arnold
- CRANES**
Brown Hoisting Machinery Co.
- CRANES, WRECKING**
F. H. Hopkins & Co.
- CRANES, ELECTRIC**
Babcock & Wilcox
Dominion Bridge Co.
F. H. Hopkins & Co.
- CRANES, TRAVELLING**
F. H. Hopkins & Co.
- CROWBARS**
B. J. Coghlin Co.
- CULVERTS**
Pedlar People, Ltd.
- CURTAINS AND FIXTURES, CAR**
Du Pont Fabrikoid Co.
Preston Car & Coach Co.
- CUTS**
Acton Burrows, Limited
- DERICKS**
M. Beatty & Sons
F. H. Hopkins & Co.
- DIES**
Butterfield & Co.
- DITCHERS**
M. Beatty & Sons
F. H. Hopkins & Co.
- DIVING OUTFITS**
John Date
F. H. Hopkins & Co.
- DOOR SIGNS**
Acton Burrows, Limited
- DRAFT GEAR**
Standard Coupler Co.
- DREDGES**
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works
- DRILLS**
Canadian Ingersoll-Rand Co.
John Morrow Screw & Nut Co.
- DRILLS, AIR**
F. H. Hopkins & Co.
Independent Pneumatic Tool Co.
- DRILLS, RADIAL**
Canada Machinery Corporation
- DRILLS, VERTICAL**
Canada Machinery Corporation
- DRILLS, WELL**
F. H. Hopkins & Co.
- DUMP CARS, CONTRACTORS'**
Hart-Otis Can. Co.
F. H. Hopkins & Co.
- DYNAMO AND ELECTRIC CASTINGS**
Dominion Brakeshoe Co.
- ECONOMIZERS**
Babcock & Wilcox
- ELECTRIC CAR ROUTE SIGNS**
Acton Burrows, Limited
Preston Car & Coach Co.
- ENAMELED IRON SIGNS**
Acton Burrows, Limited
- ENGINEERS**
Arnold Co.
Jacobs & Davies
Roberts & Schaefer Co.
Angus Sinclair & Co.
- ENGINES, AUTOMATIC**
Polson Iron Works
- ENGINES, HOISTING**
M. Beatty & Sons
Canadian Ingersoll-Rand Co.
F. H. Hopkins & Co.
Polson Iron Works
- ENGINES, STATIONARY AND MARINE**
Polson Iron Works
- ENGINES, STEAM**
F. H. Hopkins & Co.
- EXPRESS OFFICE SIGNS**
Acton Burrows, Limited
- FARE BOX HOLDERS**
Coleman Fare Box Co.
- FARE BOXES, P.A.Y.E. OPERATION**
Coleman Fare Box Co.
- FARE BOXES, PORTABLE AND STATIONARY**
Coleman Fare Box Co.
- FILES**
Nicholson File Co.
- FORGINGS**
Nova Scotia Steel & Coal Co.
Steel Co. of Canada
- FROGS**
Canadian Ramapo Iron Works
- GAUGE COCKS**
Ohio Brass Co.
- GAUGES, LOCOMOTIVE**
Taylor & Arnold
- GEARS AND PINIONS**
Allen General Supplies, Ltd.
- GRATES, SHAKING**
Babcock & Wilcox
Polson Iron Works
- HAMMERS, CAST STEEL**
Dominion Brakeshoe Co.
F. H. Hopkins & Co.
- HANDCARS**
F. H. Hopkins & Co.
Rice Lewis & Sons
- HANGERS, CABLE**
Standard Und. Cable Co. of Can.
- HEADLIGHTS**
Commercial Acetylene Ry. Lt. and Sig. Co.
- HEADLININGS**
Ohio Brass Co.
- HEATING, CAR**
Chicago Car Heating Co.
Consolidated Car Heating Co.
- HOISTS, PNEUMATIC**
Taylor & Arnold
- HOISTS, STEAM**
M. Beatty & Sons
- HOOKS**
Steel Co. of Canada
- HOPPERS, CAR, WET OR DRY**
Duner Co.
- ILLUSTRATIONS**
Acton Burrows, Limited
- INSPECTIONS**
R. W. Hunt & Co.
- INSULATORS, PORCELAIN**
Ohio Brass Co.
- INSURANCE, ACCIDENT**
Imperial Guar. & Acc. Ins. Co.
- INTERLOCKING PLANT AND SIGNALS**
Canadian Steel Foundries, Ltd.
Gen. Railway Signal Co. of Can.
- IRON AND STEEL BARS**
Steel Co. of Canada
- IRON SIGNS**
Acton Burrows, Limited
- IRON, PIG**
Nova Scotia Steel and Coal Co.
Steel Co. of Can.
- JACKS**
Canadian Brakeshoe Co.
Canadian Steel Foundries, Ltd.
F. H. Hopkins & Co.
A. O. Norton, Limited
- JOURNAL BEARINGS**
Canadian Bronze, Limited
Jas. W. Pyke & Co.
- LAGGING AND COVERING, LOCOMOTIVE**
Taylor & Arnold
- LAGER BEER, ETC.**
E. L. Drewry
- LAMPS AND LANTERNS**
F. H. Hopkins & Co.
The Hiram L. Piper Co.
- LAMPS, GAS**
Commercial Acetylene Ry. Lt. and Sig. Co.
- LAMPS, INCANDESCENT**
Canadian Westinghouse Co.
- LATHES**
John Bertram & Sons Co.
Canada Machinery Corporation
- LIGHTING, CAR**
Commercial Acetylene Ry. Lt. and Sig. Co.
- LIGHTING, SIGNAL**
Commercial Acetylene Ry. Lt. and Sig. Co.
- LIGHTS, CONTRACTORS' AND WRECKING**
F. H. Hopkins & Co.
- LINE MATERIAL**
Ohio Brass Co.
- LOCOMOTIVES, CONTRACTORS'**
Canadian Locomotive Co.
Montreal Locomotive Works
F. H. Hopkins & Co.
- LOCOMOTIVES, ELECTRIC**
Montreal Locomotive Works
- LOCOMOTIVES, LOGGING**
Canadian Locomotive Co.
F. H. Hopkins & Co.
Montreal Locomotive Works
- LOCOMOTIVES, RACK**
Canadian Locomotive Co.
Montreal Locomotive Works
- LOCOMOTIVES, STEAM**
Canadian Locomotive Co.
F. H. Hopkins & Co.
Montreal Locomotive Works
- LORRIES, TRACKLAYING**
F. H. Hopkins & Co.
- LUBRICATORS**
Canadian Detroit Lubricator Co.
Taylor & Arnold
- MACHINES AND PLANT, CONTRACTORS'**
M. Beatty & Sons
F. H. Hopkins & Co.
- MACHINES, BORING AND TURNING**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, CAR SHOP**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, CEMENT**
Jas. W. Pyke & Co.
- MACHINES, DRILLING**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, HOISTING**
M. Beatty & Sons
Brown Hoisting Machinery Co.
- MACHINES, HYDRAULIC**
R. D. Wood & Co.
- MACHINES, MILLING**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, PLANING AND SHAPING**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, RADIAL DRILLING**
John Bertram & Sons Co.
Canada Machinery Corporation
- MACHINES, RAIL DRILLING**
F. H. Hopkins & Co.
- MACHINES, SLOTTING**
John Bertram & Sons Co.
Canada Machinery Corporation

Hunt-Spiller Gun Iron

IN

Locomotive Castings

SAVES MONEY

INCREASES: Engine Efficiency—Engine Mileage.
DECREASES: Engine Failures—Engine Repairs.

MADE ONLY BY

Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.

J. G. Platt,
Sales Manager.

Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.

BRADSTREET'S

Capital and Surplus, \$1,500,000.
Offices throughout the Civilized World.

Executive Offices:
NOS. 346 and 348 BROADWAY,
N.Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA:

Halifax, N.S.; Hamilton, Ont.; London, Ont.;
Montreal, Que.; Ottawa, Ont.; Quebec, Que.;
St. John, N.B.; Toronto, Ont.; Vancouver, B.C.;
Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.;
Victoria, B.C.

THOS. C. IRVING,

Gen. Man. Western Canada, Toronto.

Insist on having

DREWRY'S American STYLE RICE BEER

The best beer—
without exception

E. L. Drewry, Ltd., Winnipeg

Which Method

prevails in your plant? Does
it take two men to do one
man's work.

Why don't you re-
place that old antiqua-
ted tool with a new up
to date

Reece's New Screw Plate

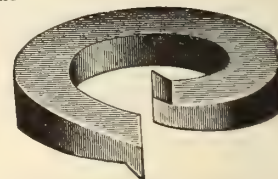
These pictures do not
exaggerate conditions
as you can actually see
them, if you will visit
Machine Shops through-
out the country.

Lessen your cost by giving
your mechanics a REECE'S
NEW SCREW PLATE.

Butterfield & Co., Inc.

Rock Island, Que.

The Positive Lock Washer
is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks

The Positive Lock Washer Co.
Sole Mfrs., Newark, N.J.

F. H. HOPKINS & CO.,

Agents, Montreal

Car Closets

Flush or Dry

DUNER CO.

101 S. CLINTON ST.
CHICAGO

MACHINES, TRACKLAYING

F. H. Hopkins & Co.
MACHINES, WOOD AND IRON WORKING

Canada Machinery Corporation

MACHINE TOOLS

John Bertram & Sons Co.
 Canada Machinery Corporation
 Pratt & Whitney Co.

MANHOLE FRAMES & COVERS

Canada Iron Foundries
 Dominion Brakeshoe Co.

MARINE PAINTS AND VARNISHES

Martin Senour Co.
 Toch Bros.

MARINE REPAIRS

Goldschmidt Thermit Co.

MARINE SUPPLIES

Rice Lewis & Sons

METALS

Goldschmidt Thermit Co.

METAL WORK, STRUCTURAL

Canadian Bridge Co.
 Dominion Bridge Co.
 Jas. W. Pyke & Co.

MILEPOST NUMBERS

Acton Burrows, Limited

MONEL METAL

International Nickel Co.

MOTOR CARS

Fairmont Gas. Eng. and Ry.
 Motor Car Co.

MOTORS, TURNTABLE

Taylor & Arnold

NAILS, CUT AND WIRE

Steel Co. of Canada

NICKEL, SHEET, ROD, WIRE & TUBE

International Nickel Co.

NICKEL, METALLIC SHOT & INGOTS

International Nickel Co.

NUMBERS

Acton Burrows, Limited

NUT LOCKS

Positive Lock Washer Co.

OFFICE FITTINGS

Can. Office & School Furn. Co.

OFFICE SIGNS

Acton Burrows, Limited

OILS

Galena-Signal Oil Co.

PACKING

Garlock Packing Co.

PAINTS

Martin Senour Co.

Toch Bros.

PATENT ATTORNEYS

H. J. S. Dennison

H. C. Shipman & Co.

Van Hallen & O'Neil

PILE DRIVERS, RAILWAY

F. H. Hopkins & Co.

PIPE, STEAM

Babcock & Wilcox

PIPE STOCKS

Butterfield & Co.

PIPE, WROUGHT, LEAD AND GALVANIZED

Steel Co. of Canada

PLANERS

John Bertram & Sons Co.

Canada Machinery Corporation

PLATFORMS, STEEL

Standard Coupler Co.

PLOUGHS, CONTRACTORS'

F. H. Hopkins & Co.

PORTER

E. L. Drewry

PUMPS

F. H. Hopkins & Co.

PUMPS, CENTRIFUGAL

M. Beatty & Sons

F. H. Hopkins & Co.

R. D. Wood & Co.

PUNCHES AND SHEARS

Canada Machinery Corporation

PUTTY

Steel Co. of Canada

RAIL BONDS

Ohio Brass Co.
 Elec. Railway Improvement Co.

RAIL BENDERS

Canadian Steel Foundries, Ltd.

RAIL JOINTS

Goldschmidt Thermit Co.

The Rail Joint Co. of Canada

RAILS, NEW

Algoma Steel Corporation

Dominion Iron & Steel Co.

J. J. Gartshore

F. H. Hopkins & Co.

RAILS FOR RELAYING

J. J. Gartshore

Jas. W. Pyke & Co.

RAILWAY SUPPLIES

Franklin Railway Supply Co.

F. H. Hopkins & Co.

Rice Lewis & Sons

The Hiram L. Piper Co.

REAMERS

Butterfield & Co.

REPLACERS, CAR AND LOCOMOTIVE

F. H. Hopkins & Co.

RIVETS

Steel Co. of Canada, Ltd.

RIVETTERS

Canadian Ingersoll-Rand Co.

ROCK CRUSHERS

F. H. Hopkins & Co.

ROPES, DERRICK

Dominion Wire Rope Co.

ROOFING, CAR

Franklin Railway Supply Co.

F. H. Hopkins & Co.

RUBBER GOODS

Can. Consolidated Rubber Co.

SANDERS, PNEUMATIC

Onio Brass Co.

SAWS, HACK

Diamond Saw & Stamping Co.

SCOWS, DUMP AND DECK

M. Beatty & Sons

SCREW PLATES

Butterfield & Co.

SCRAPERS, WHEEL AND DRAG

F. H. Hopkins & Co.

SCREWS, WOOD AND MACHINE

John Morrow Screw and Nut Co.

Steel Co. of Canada

SEMAPHORE ARMS

Acton Burrows, Limited

SHEET PILE DRIVERS

Canadian Ingersoll-Rand Co.

SHIPS

Polson Iron Works

SIGNAL HOUSE NUMBERS

Acton Burrows, Limited

SIGNALS

Gen. Railway Signal Co. of Can.

The Hiram L. Piper Co.

Acton Burrows, Limited

SNOW PLOUGHS

Crossen Car Co.

F. H. Hopkins & Co.

SPIKES, RAILWAY, SHIP OR PRESSED

Nova Scotia Steel and Coal Co.

Steel Co. of Canada

SPLICING TUBES AND COMPOUNDS

Standard Und. Cable Co. of Can.

SPREADER CARS

F. H. Hopkins & Co.

SPRINGS

Canadian Steel Foundries, Ltd.

B. J. Coghlin & Co.

SPRINKLERS, ELECTRIC

Preston Car & Coach Co.

STAPLES

Steel Co. of Canada

STATION NAME SIGNS

Acton Burrows, Limited

STAYBOLT IRON

Taylor & Arnold

Trolley Supply Co.

STAYBOLTS, FLEXIBLE

Flannery Bolt Co.

STAYBOLTS, LOCOMOTIVE

Flannery Bolt Co.

STAYBOLT TAPS

Butterfield & Co.

STEAM HAMMERS

John Bertram & Sons Co.

STEAM SHOVELS

M. Beatty & Sons

F. H. Hopkins & Co.

STEAMSHIP SIGNS

Acton Burrows, Limited

STEEL

Nova Scotia Steel and Coal Co.

STEEL, FIRE BOX

Taylor & Arnold

Canadian Steel Foundries, Ltd.

STEEL FOR AXES

Canadian Steel Foundries, Ltd.

STEEL FOR SAWS

Canadian Steel Foundries, Ltd.

STEEL FOR TIRES

Steel Co. of Canada

STEEL SHAFTING

Nova Scotia Steel and Coal Co.

STEEL PLATES

Jas. W. Pyke & Co.

STEEL TOOL

Canadian Steel Foundries, Ltd.

F. H. Hopkins & Co.

STOKERS, MECHANICAL

Babcock & Wilcox

STRAINERS

Babcock & Wilcox

SUPERHEATERS

Babcock & Wilcox

Locomotive Superheater Co.

SWITCH TARGETS

Acton Burrows, Limited

SWITCHES

Canadian Ramapo Iron Works

TACKS

Steel Co. of Canada

TANKS AND TANK FIXTURES

F. H. Hopkins & Co.

Polson Iron Works

TANKS, PORTABLE ACETYLENE, WELDING

Commercial Acetylene Ry. Lt. and Sig. Co.

TAPS

Butterfield & Co.

TELEGRAPH AND TELEPHONE OFFICE SIGNS

Acton Burrows, Limited

TERMINALS, JUNCTION BOXES

Standard Und. Cable Co. of Can.

THERMIT

Goldschmidt Thermit Co.

TIE PLATES

Algoma Steel Corporation

B. J. Coghlin

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

TICKET CASES

Canadian Office & School Fur. Co.

TIRES, STEEL

Jas. W. Pyke & Co.

TOOLS AND SUPPLIES

F. H. Hopkins & Co.

Pratt & Whitney Co.

TOOLS, CAST STEEL

Dominion Brakeshoe Co.

TOOLS, TRACK

John Bertram & Sons Co.

Canadian Steel Foundries, Ltd.

B. J. Coghlin Co.

F. H. Hopkins & Co.

TOOLS, PNEUMATIC

Canadian Ingersoll-Rand Co.

Independent Pneumatic Tool Co.

TRAMWAY EQUIPMENT

J. J. Gartshore

TRACK EQUIPMENT

Canadian Ramapo Iron Works

F. H. Hopkins & Co.

TROLLEY BASES

Allen General Supplies, Ltd.

Ohio Brass Co.

TROLLEY CATCHERS

Allen General Supplies, Ltd.

Ohio Brass Co.

Trolley Supply Co.

TROLLEY GUARDS

Ohio Brass Co.

Trolley Supply Co.

TROLLEY RETRIEVERS

Allen General Supplies, Ltd.

Ohio Brass Co.

Trolley Supply Co.

TROLLEY WHEELS

Star Brass Works

TRUCKS, ELECTRIC CAR

Canadian Steel Foundries, Ltd.

TRUSSES, ROOF

Canadian Bridge Co.

Dominion Bridge Co.

TUBES, BOILER

F. H. Hopkins & Co.

TUBE CLEANERS

F. H. Hopkins & Co.

TURNBUCKLES

Canadian Steel Foundries, Ltd.

TURNTABLES

Canadian Bridge Co.

Dominion Bridge Co.

UPHOLSTERY, CAR

Du Pont Fabrikoid Co.

VALVES

Canadian Detroit Lubricator Co.

R. D. Wood & Co.

VALVES, ANGLE AND GLOBE

Ohio Brass Co.

VALVES, BRASS GATE

Ohio Brass Co.

VALVES, LOCOMOTIVE POP

Taylor & Arnold

VARNISHES

Berry Bros.

Martin Senour Co.

VENTILATORS, CAR

Automatic Ventilator Co.

Alphabetical List of Advertisers

A	
Algoma Steel Corporation.....	20
Allen General Supplies, Ltd.	81
Arnold Co.	87
Automatic Ventilator Co.....	25

B	
Babcock & Wilcox.....	23
Beatty, M. & Sons, Co.....	86
Berry Bros.	12
Bertram, John & Sons, Co.....	1
Bradstreet Company	90
Brown Hoisting Machinery Co... 4	
Buffalo Brake Beam Co.	22
Burrows—Acton Burrows, Ltd... 85	
Butterfield & Co.	90

C	
Canada Iron Foundries, Ltd.....	22
Canada Machinery Corporation.. 3	
Canada Steamship Lines, Ltd.... 17	
Canadian Brakeshoe Co.....	83
Canadian Bridge Co.....	83
Canadian Bronze, Ltd.....	84
Canadian Consolidated Rubber Co. 26	
Canadian Detroit Lubricator Co. 88	
Canadian Fairbanks-Morse Co... 19	
Canadian Government Railways.. 21	
Canadian Ingersoll-Rand Co..... 18	
Canadian Locomotive Co.....	15
Canadian Marconi Co.....	83
Canadian National Carbon Co... 25	
Canadian Northern Railway..... 15	
Canadian Office & School Furni- ture Co.....	81
Canadian Pacific Railway.....	85
Canadian Ramapo Iron Works.... 81	
Canadian Steel Foundries, Ltd... 14	
Canadian Westinghouse Co.....	2
Chicago Car Heating Co.....	83
Coghlin, B. J., Co.....	24
Commercial Acetylene Ry., Light & Signal Co.....	20
Consolidated Car Heating Co.... 81	

D	
Date, John	86
Dearborn Chemical Co. of Canada 13	
Dennison, H. J. S.	87

Diamond Saw & Stamping Works 23	
Dominion Brakeshoe Co.....	92
Dominion Bridge Co.....	87
Dominion Iron & Steel Co.....	24
Dominion Iron & Wrecking Co... 82	
Dominion Steel Foundry Co..... 83	
Dominion Wire Rope Co.....	9
Drewry, E. L., Ltd.....	90
Duner Co.....	90
Du Pont Fabrikoid Co.....	14

E	
Electric Railway Improvement Co. 25	

F	
Fairmont Gas Engine & Ry. Mo- tor Car Co.....	88
Flannery Bolt Co.	11
Franklin Railway Supply Co.... 91	

G	
Galena-Signal Oil Co.....	93
Garlock Packing Co.....	12
Gartshore, J. J.....	85
General Ry. Signal Co. of Canada 7	
Goldschmidt Thermit Co.	10
Grand Trunk Railway.....	10
Griffin & Brinkerhoff.....	81

H	
Hart-Otis Car Co.	9
Hopkins, F. H. & Co.....	9
Hunt, Robert W. & Co.....	87
Hunt-Spiller Mfg. Corporation 8 and 90	

I	
Imperial Bank of Canada.....	81
*Imperial Guar. & Acc. Ins. Co. —	
Independent Pneumatic Tool Co. 21	
International Correspond. Schools 84	
International Nickel Co.....	84

J	
Jacobs & Davies.....	87

L	
Lewis, Rice & Son.....	23
Locomotive Superheater Co..... 82	

M	
Martin-Senour Co., The.....	16
Montreal Locomotive Works..... 17	
Morrow, John Screw & Nut Co... 86	

N	
National Steel Car Co.....	94
Nicholson File Co.....	18
Norton, A. O., Inc.....	2
Northern Electric Co.....	19
Nova Scotia Steel & Coal Co.... 13	

O	
Ohio Brass Co.....	11
Ottawa Car Manufacturing Co. 6 and 85	

P	
Pedlar People, Ltd.....	84
Piper, The Hiram L., Co.....	88
Polson Iron Works.....	16
Positive Lock Washer Co.....	90
Pratt & Whitney Co. of Canada.. 86	
Preston Car and Coach Co.....	83
Pyke, J. W. & Co.....	21

R	
Rail Joint Co. of Canada.....	24
Roberts & Schaefer Co.....	87

S	
Shipman, Harold C., & Co.....	87
Sinclair, Angus.....	87
Standard Coupler Co.....	91
Standard Underground Cable Co. of Canada.....	86
Star Brass Works.....	22
Steel Co. of Canada.....	5

T	
Taylor & Arnold.....	20
Terry & Tench Co.....	87
Toch Bros.....	81
Trolley Supply Co.....	82

V	
Van Hallen & O'Neil.....	87

W	
Wood, R. D., & Co.....	87

*Advertisements marked with an asterisk appear in alternate issues.



Money paid for these Brake Shoes was largely money wasted

Why?

Because these unreinforced brake shoes did not give equivalent service for their cost, having broken in service before their life had barely commenced.

And the remedy?

Use only Reinforced Brake Shoes—then you will get your brake shoe money's worth in long and safe service.

Manufactured in Canada.

Dominion Brake Shoe Company, Limited

The HOLDEN CO., Limited, Agents,
350-356 St. James Street, MONTREAL

Galena-Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office — 603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil

in Headlights, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

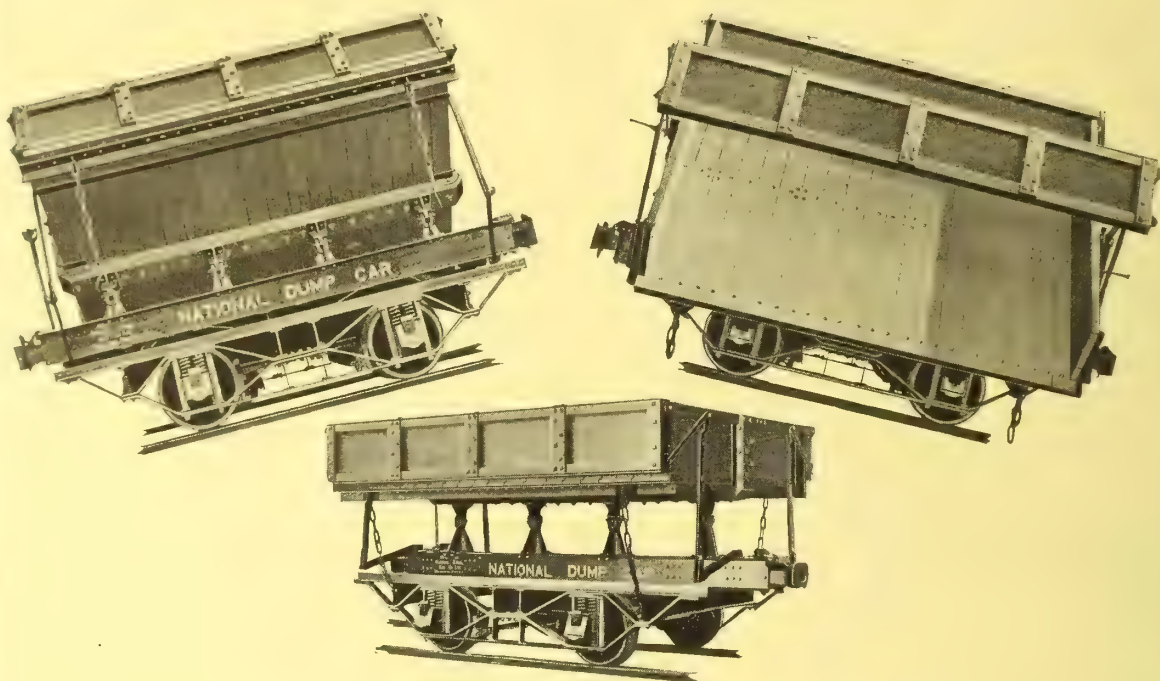
for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and Correspondence Solicited.

S. A. MEGEATH,
PRESIDENT.



NATIONAL DUMP CARS



THIS is the sturdiest type of Dump Car Ever designed. Our engineers had instructions to make a Dump Car that would "stand up" under every-day use. The large number of these cars now in use and giving complete satisfaction is the best proof of the quality of the materials and the correctness of the design that is employed.

National Dump Cars are made in 4, 5, 6 and 8 cubic yard capacities, in the hand dump type. With power dump the capacities are 10, 12, 16 and 20 cubic yards.

Engineers and Contractors interested in securing the best type of dump car for construction works are invited to enquire for full specifications and prices on stock or special dump cars.

National Steel Car Company, Limited

Works and Operating Offices:
HAMILTON, CANADA

Montreal Office.
SHAUGHNESSY BUILDING

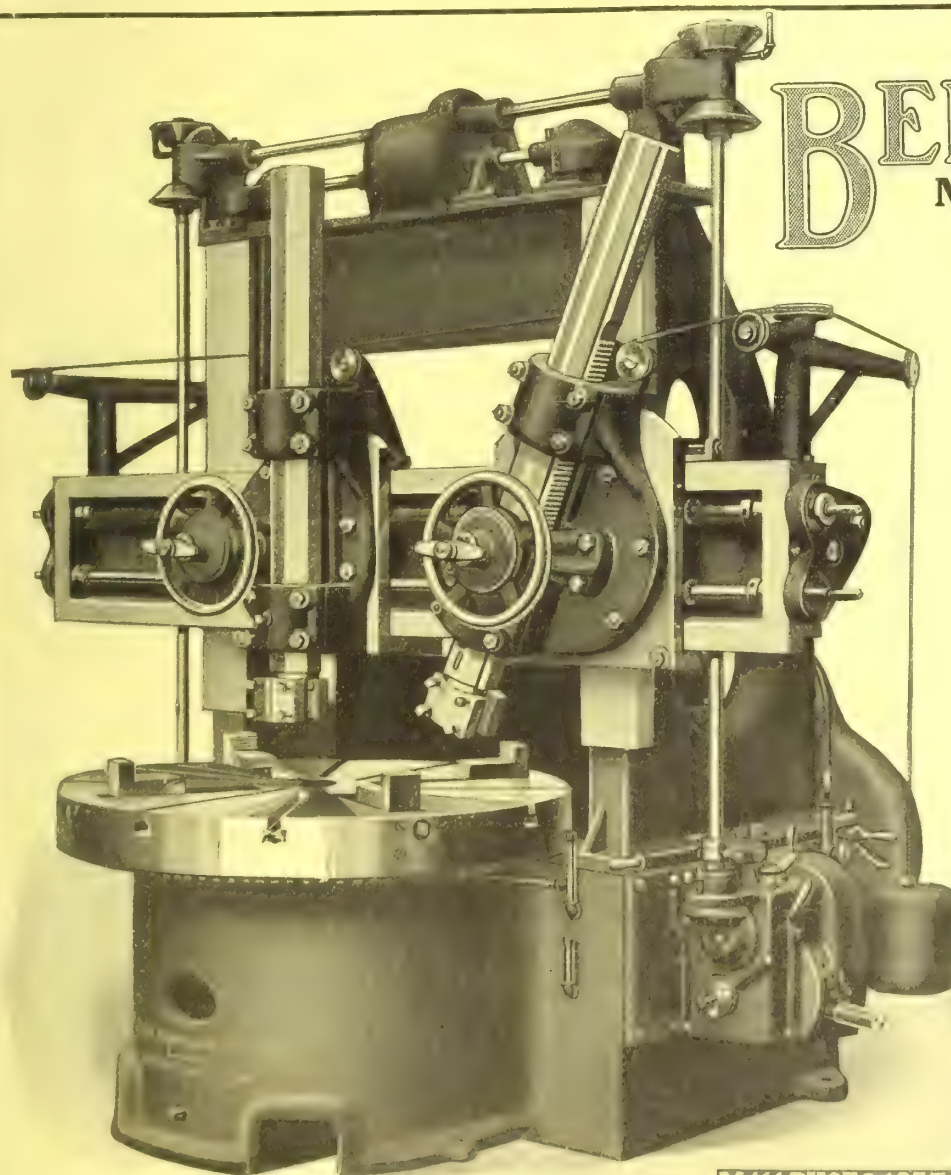
Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 222

TORONTO, CANADA, AUGUST, 1916

Subscription Rates, Page 327



BERTRAM

MACHINE
TOOLS

**42-inch
Vertical
Boring
and
Turning
Mill**

*Niles
Type*

Motor-driven through
speed box.

Built in sizes from 42-
inch to 100-inch swing.

Drop us a line for Pho-
tographs and full par-
ticulars.

M111 PHOTO 1057

Locomotive and Car Shop Equipment.

The John Bertram & Sons Co., Limited

Dundas, Ontario, Canada

MONTREAL
723 Drummond Bldg.

VANCOUVER
609 Bank of Ottawa Bldg.

WINNIPEG
1205 McArthur Bldg.



Lake Erie & Northern Railway 50 Ton Baldwin-Westinghouse,
1500 Volt, Direct-Current Electric Locomotive.

Express Service at Freight Rates

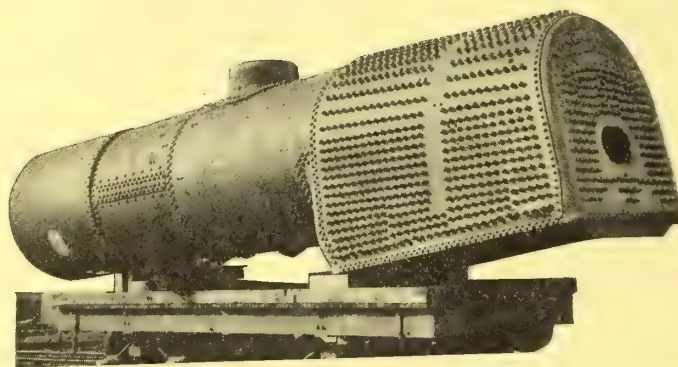
May be easily maintained
with a—

Baldwin-Westinghouse Electric Locomotive

Many electric railways are taking advantage of these revenue builders, by running freight trains during the night or when few cars are on the line.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

TORONTO, Traders Bank Bldg. MONTREAL, 52 Victoria Sq. OTTAWA, Ahearn & Soper, Ltd. HALIFAX, 105 Hollis St. FT. WILLIAM, Telfer Bldg.
WINNIPEG, 158 Portage Ave. E. CALGARY, Grain Exchange Bldg. EDMONTON, Dominion Bldg. VANCOUVER, Bank of Ottawa Bldg.



It is an Established Fact

That fireboxes of all types equipped with the Tate Flexible Staybolt show the lowest maintenance cost and highest earnings.

The Flexibility in the bolt serves to accommodate the relative expansion of plates under working operations of the fire box and boiler in a manner that has afforded less destruction to the sheets and seams than were found under conditions where fireboxes were rigidly stayed.

The Tate Flexible Staybolt is designed and made to give satisfactory results in the final measure of its usefulness, as an economic, safe and reliable factor in reducing the costs of firebox repairs and maintenance.

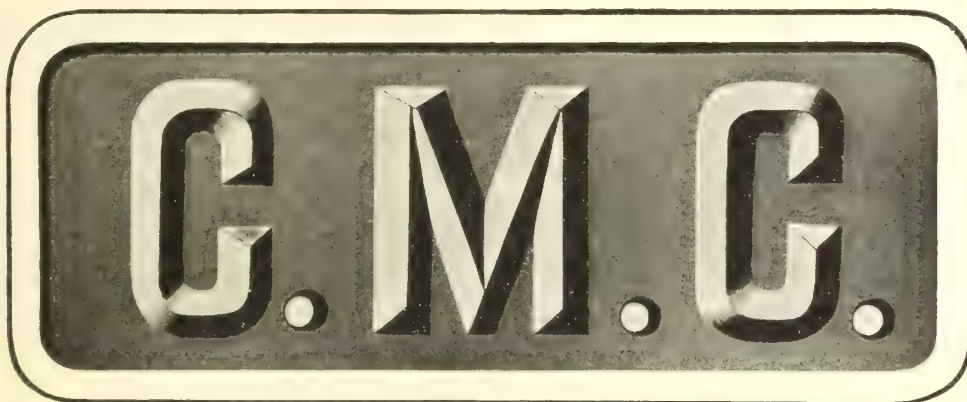
In use on all the prominent railroad systems of Canada.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.

EVERY MACHINE

Manufactured by Us Bears
This Registered Trade Mark



This Trade Mark is a guarantee that the materials, design and workmanship are of the highest class.

Insure satisfactory service by insisting on having this Trade Mark on your—

**Wood and Iron Working
Machine Tools**

For convenience of the trade we have opened show-rooms in Toronto, at Brock Avenue Subway, where a full line of our machinery can be inspected.

CANADA MACHINERY CORPORATION
LIMITED

GALT, ONTARIO

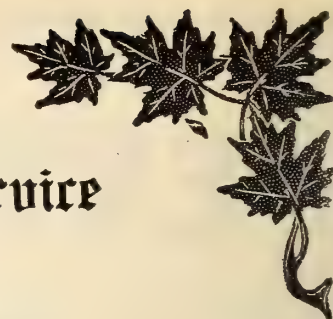
Builders of Machine Tools and Woodworking Machinery.



Quality



Service



The Steel Company of Canada, Limited

PRODUCTS

**"HAMILTON" PIG IRON
BASIC, MALLEABLE AND FOUNDRY**

**IRON AND STEEL
BLOOMS, BILLETS, BARS, WIRE RODS, ANGLES, CHANNELS,
PLOW BEAMS, ETC.**

FORGINGS

Car Axles, Shape and Drop Forgings, Horse Shoes, Carriage and Automobile Hardware, Top Goods Etc.

WIRE, ETC.

Steel, Brass, Copper and Bronze, Heavy and Fine, Bright Annealed, Coppered, Liquor Bright Galvanized and Tinned. Stranded, Steel and Copper Cable, Clothes Line, Wire Nails, Staples, Barb Wire, Woven Wire Fencing, Fence Gates

RAILWAY FASTENINGS

Angle Bars, Track Bolts, Tie Plates, Spikes, Tie Rods, Etc.

NAILS, SPIKES, RIVETS, ETC.

Wire, Cut, Boat and Horse Shoe Nails, Railway, Pressed and Drift Spikes
Tack and Shoe Nails, Steel and Copper Rivets and Burrs, Iron, Brass and Copper

POLE LINE HARDWARE

Pole Steps, Cross Arm Braces, Guy Clamps and Guy Rods, Etc., Black and Galvanized

BOLTS, NUTS AND WASHERS

Machine, Carriage, Elevator, Stove, Tire and Sleigh Shoe Bolts, Blank, Tapped Nuts and Washers

WROUGHT PIPE

Black and Galvanized Nipples and Couplings

SCREWS

Wood and Machine Steel, Brass and Bronze

LEAD PRODUCTS

Lead Pipe, White Lead, Shot and Putty

The Steel Company of Canada, Limited

HAMILTON

TORONTO

MONTREAL

WINNIPEG



Absolute Permissive Block-



is the title of a new bulletin on a thoroughly tried-out single-track signal-system which has been installed on 21 steam and electric railways, totaling 2,323 miles of Absolute-Permissive Signaling.

The cost of installation per mile of the A-P-B System is less than one-half the cost per mile of the steel in your tracks. The maintenance and operation is close to 50 cents per mile per day. An increase in your track capacity of only about 4 per cent. will pay for the investment. In addition to increasing your track capacity, the A-P-B System provides "protection" and eliminates numerous delays. If you are contemplating double-tracking your line, the Absolute Permissive Block System will save you approximately 9/10 of the cost and give you the signal protection you need.

Mr. W. J. Eck, President of the Railway Signal Association, in a report on the "Progress of Signaling" which appeared in the December 31, 1915, issue of the Railway Age Gazette, wrote in part as follows:

"Single-track automatic signaling is receiving an increasing amount of attention and the mileage in-

stalled during the year greatly exceeds that on double track. It has been only a few years since railway officers believed that automatic signals on single track would hinder instead of facilitate movements. Particularly since the so-called 'absolute permissive block' has been developed has this idea given way to a realization of the safety and aid that the system affords. In the A-P-B System for single-track signaling the trains are given an absolute block from passing siding to passing siding for opposing trains and a permissive block for following trains. This system has been almost exclusively installed during the past year."

Ask for a copy of Bulletin 128A and learn more fully of the desirable features of this System.

GENERAL RAILWAY SIGNAL COMPANY
OF CANADA LIMITED

LACHINE

QUEBEC

GALENA OILS

HAVE NO EQUAL IN
QUALITY, EFFICIENCY and ECONOMY

SOLE MANUFACTURERS OF
Celebrated Galena Coach, Engine and Car Oils
LUBRICATION ON A GUARANTEED BASIS

ELECTRIC RAILWAY LUBRICATION
A SPECIALTY

Perfection Valve and Signal Oils

Galena Railway Safety Oil—Made especially for use in headlights, marker and classification lamps.

Galena Long Time Burner Oil—For use in switch and semaphore lamps, and all lamps for long time burning, avoiding smoked and cracked chimneys and crusted wicks.

TESTS AND CORRESPONDENCE SOLICITED

Galena Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.

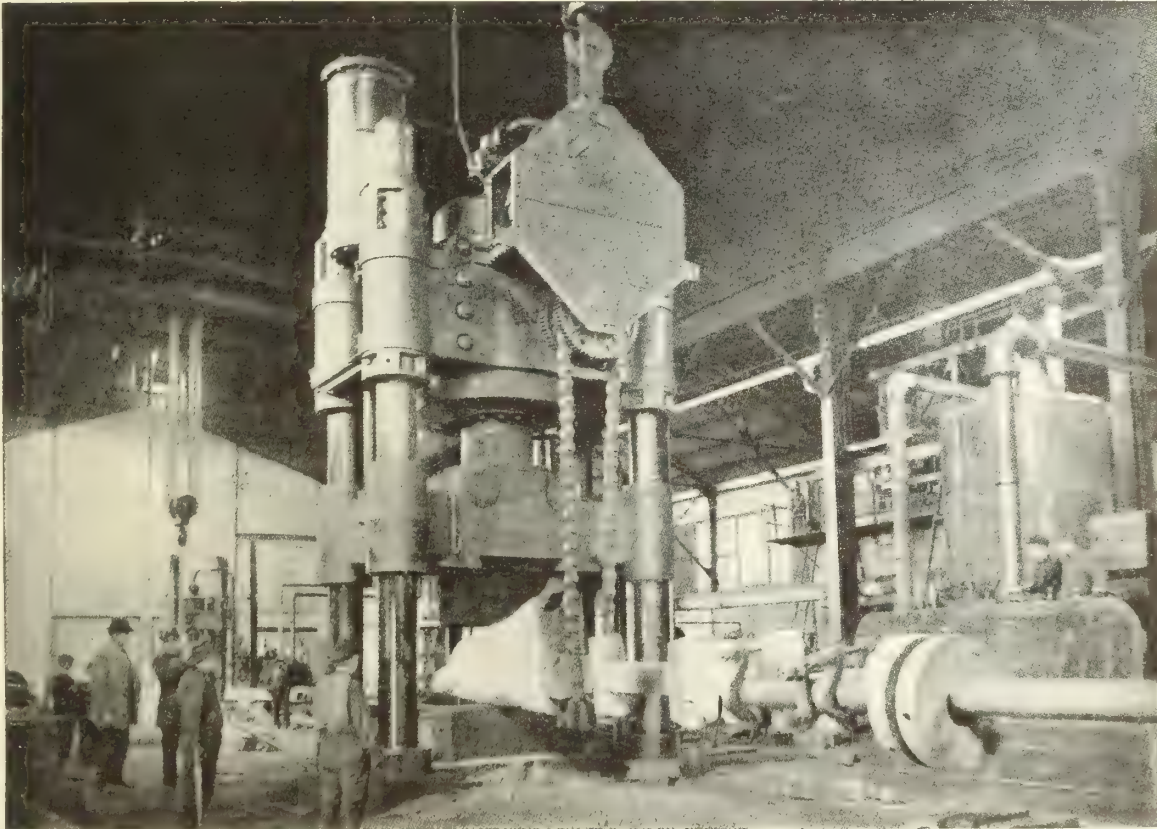
Nova Scotia Steel & Coal Company

LIMITED

Manufacturers of Steel for Shrapnel Shells and Admiralty Forgings

Only Company in Canada producing Steel Ingots by the "Harmet" liquid process

Can supply Forgings up to 40 Tons in weight to all Admiralty and Lloyd's Tests and Specifications



FORGING A RUDDER FRAME

Why "Harmet" Liquid Process Steel Ingots are Superior to Ordinary Steel Ingots:—

1. Prevention of cracks due to shrinkage; of internal stresses and resulting cracks and fissures.
2. Early cessation in the crystallization of the metal, and the production of fine crystallization without cleavage planes.
3. Lessening of segregation, i.e., reduction of tendency of carbon and other impurities to concentrate in the central and upper parts of the ingot.
4. Prevention of "pipes" or interior cavities, and thus preservation of absolute solidity in the ingot.
5. Improvement in physical properties.
6. Reduction in waste of ingot.

OUR modern Steam Hydraulic Forge Shop at New Glasgow, N.S., part of which is shown above, and our large Steel Plant at Sydney Mines, N.S., equal the very best in America.

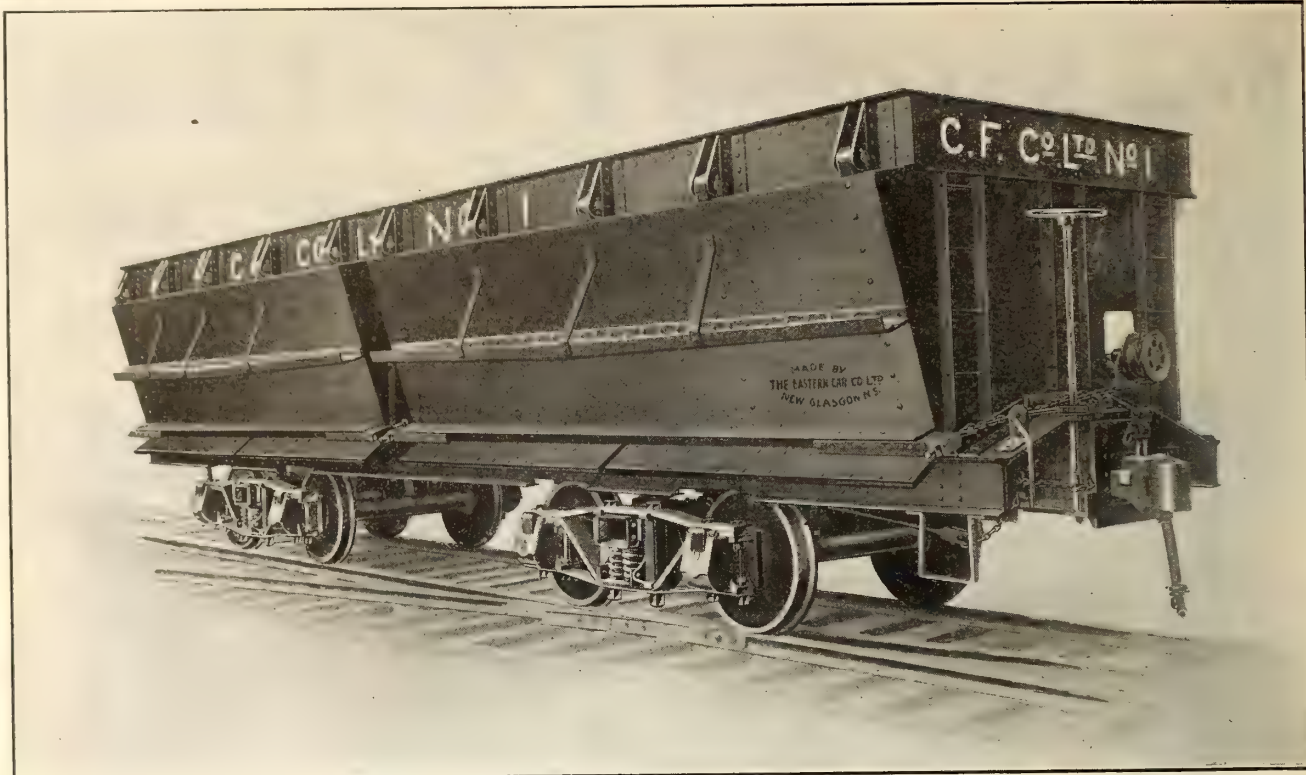
On the shortest notice, we can supply forgings of all shapes and sizes, made of ordinary or "Harmet" fluid compressed open-hearth steel, and satisfying the most severe specifications.

Our forges are modern in every respect—designed and installed after close study of the latest developments in all countries. Moreover, we produce the highest grades of steel by the most approved methods. It has always been the policy of "Scotia" to hold a position in the front rank of trade, and by the recent additions to plant, this policy has been maintained in a practical manner, bringing "Scotia's" equipment abreast of the best foreign forges.

For prices and full particulars, write to

Head Office, NEW GLASGOW, N.S.

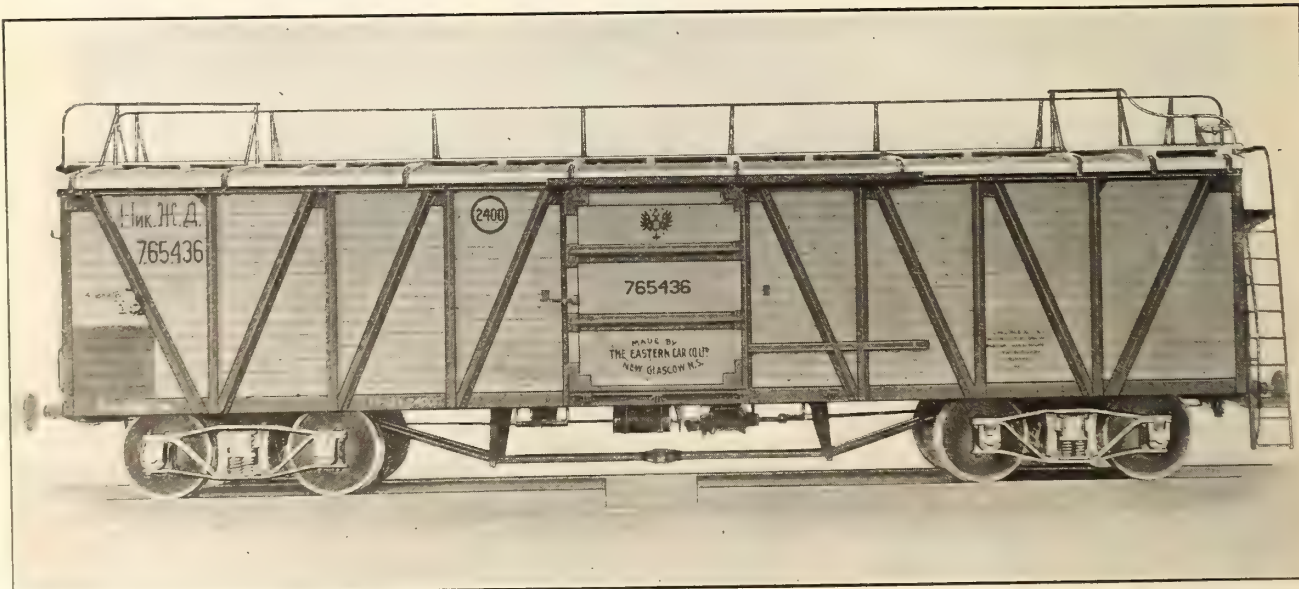
Western Sales Office, Room 14, Windsor Hotel, Montreal



"ALL-STEEL" CAR (SPECIAL DESIGN) OF 100,000 LBS. CAPACITY.

"ALL-STEEL" CARS

We have recently installed three additional hydraulic presses, and are now in a position to manufacture "All-Steel" Cars to fill the most exacting specification requirements.



40 METRIC TON CAR BELONGING TO AN ORDER RECENTLY COMPLETED FOR 2,000 CARS FROM THE IMPERIAL RUSSIAN GOVERNMENT.

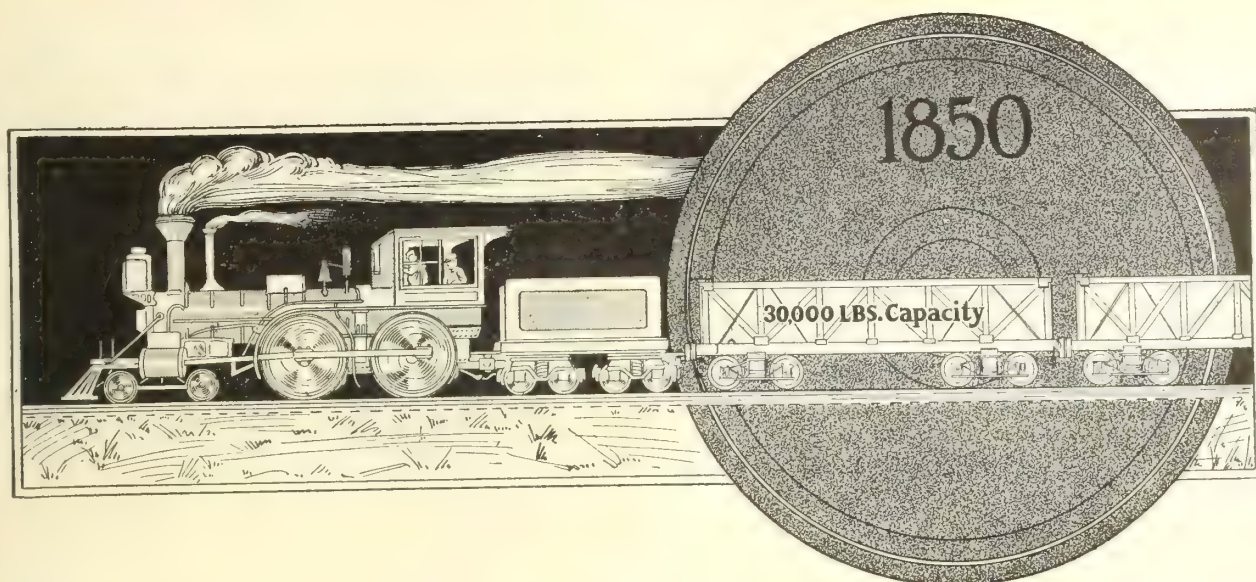
FREIGHT CARS TO ALL GAUGES

The Russian type car illustrated is exceptionally large, resembling the C.P.R. type box car. It is unusually long—43 ft., and has a carrying capacity of 40 tons of grain. The track gauge is 5 ft., being $31\frac{1}{2}$ inches wider than Canadian railroad standard. The wheels are of cast iron, $41\frac{3}{8}$ inches in diameter. Steel frame construction is employed throughout. The design provides for "knock-down" shipment.

Eastern Car Company, Limited

General Offices and Works, New Glasgow, N.S.

Montreal Office. Room 14 Windsor Hotel



The Wonderful Single Service Chilled Iron Wheel

When we consider the universal use of the Chilled Iron Car Wheel it is not surprising that we use the word WONDERFUL in designating its character.

According to the Interstate Commerce Commission report for the year ended 1914, there were 2,508,322 Freight Cars running on 250,000 miles of track representing about 10,000 Freight Cars for every 1,000 miles of line operated.

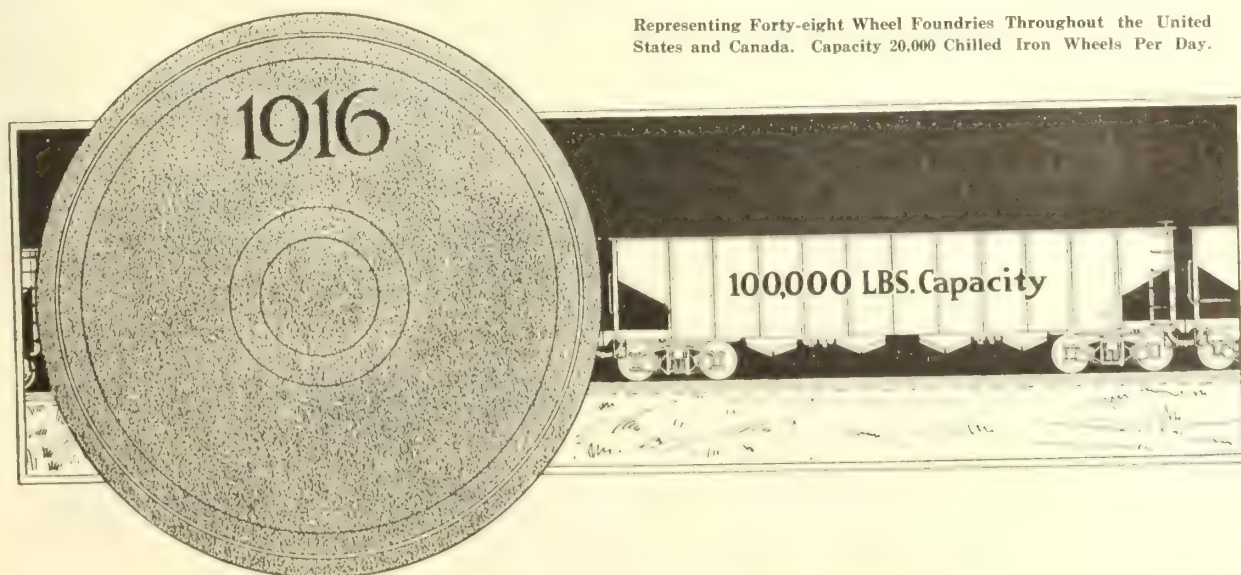
We believe that a careful analysis of this equipment would prove that ninety-seven per cent. of the wheels under these cars are Chilled Iron Car Wheels, which is abundant proof of their reliability.

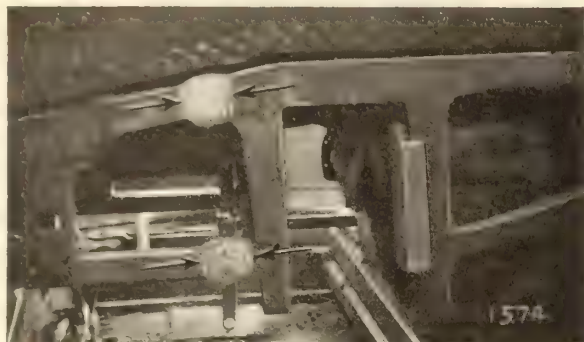
The Nation's commerce, therefore, is dependent upon the Chilled Iron Wheel, and in addition thereto there are hundreds of thousands running under passenger cars, engine tenders, private car lines, street car lines and switching and terminal companies.

25,000,000 now running.

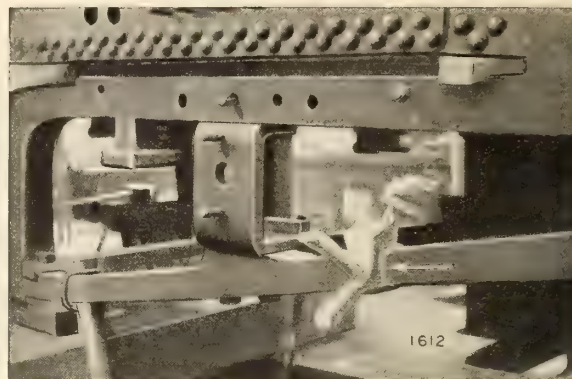
Association of Manufacturers of Chilled Car Wheels
 1228 McCormick Building, Chicago

Representing Forty-eight Wheel Foundries Throughout the United States and Canada. Capacity 20,000 Chilled Iron Wheels Per Day.





Engine Frame Welded by the Grand Trunk Pacific Ry., Transcona, Man.



Two Thermit Welds on Left Frame of Engine No. 43, of the Sydney & Louisburg Ry., Glace Bay, N.S.

RESULTS COUNT

That's Why 480 Railroad Shops Are Using Thermit

Thermit offers the only sure and reliable repair for locomotive frames and other heavy sections.

The superheated liquid Thermit steel is produced in bulk and poured all at once into a mold surrounding a broken section, resulting in the perfect amalgamation of the Thermit Steel with the parts with which it comes in contact. The fact that those parts are first preheated, makes the weld doubly sure.

The operation of welding locomotive frames is easily accomplished, without removing the frame from position, and with very little dismantling, no matter if the frame be broken in the splice, jaw, next to the cylinder saddle, or at any other point. The engine is returned to service in from ten to twelve hours.

Hundreds of thousands of pounds of Thermit are being used annually by railroad companies in the United States and Canada.

There is only one reason for this, and that is that Thermit produces results and we all know that "results count."

Our pamphlet No. 2159 will be of interest.

All Thermit and Thermit appliances are made in our Canadian Shops.

GOLDSCHMIDT THERMIT COMPANY

103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco. Equitable Bldg., 120 Broadway, New York

7300 So. Chicago Ave., Chicago





THE REASON THAT OUR
WIRE ROPES

are paramount is due to our manufacturing experience, large scale production, manufacturing facilities, and ideals of quality.

"Made in Canada" and stocks carried at Montreal, Winnipeg and St. Catharines

The Dominion Wire Rope Company, Limited

General Service Cars

Otis Dump Cars

— PATENTED —

Built in Any Size
or Capacity

All Steel, Wood or
Composite



For Standard or
Special Service

Thousands in Use

The Standard Coal Car on Canada's Leading Railroads.

Designed and Built by

The HART-OTIS CAR CO., Limited, MONTREAL

—Sole Patentees for General Service Cars for Canada—



"H & E" Ball and Cone Bearing Lifting Jacks

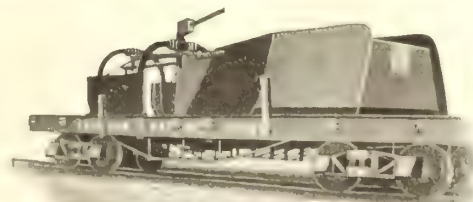
Are the Fastest Jacks Made

"MARION" Ballast Unloaders

Constructed entirely of Steel.

They work as well in Dumping
Boulders or Ballast Rock as in
Clay, Loam, Gravel and Crushed Stone.

May be used on ordinary Flat Cars.



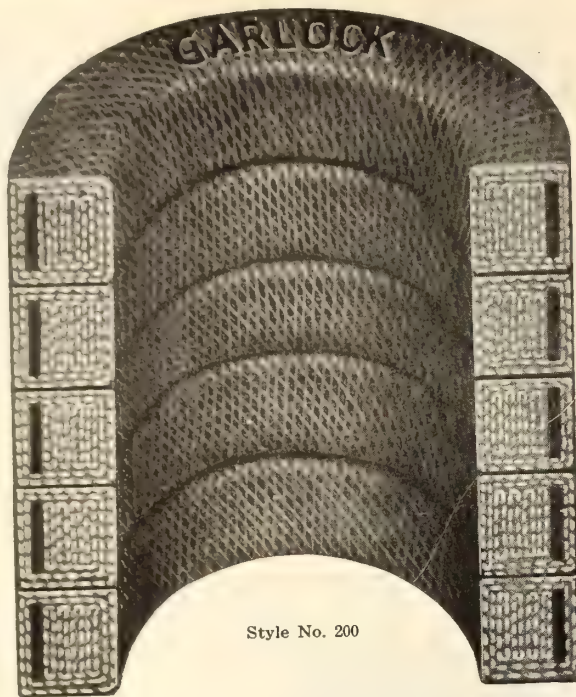
Branch:

St. Catharines, Ont.

F. H. Hopkins & Co

Head Office:

MONTREAL



Style No. 200

Garlock High Pressure Piston Rod Packing

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.

THE GARLOCK PACKING COMPANY

Hamilton, Ontario



Branches :

Montreal, Que., 342 St. James St. East Toronto, Ont., Continental Life Bldg.
Winnipeg, Man., Galt Building



The Land of Fishing Thrills

A Sportsman's Paradise where the cool waters of **Wild, Unspoiled Lakes and Rivers** give the Salmon and Speckled Trout and gamy Black Bass fighting qualities to delight the most ardent angler, making

Algonquin Park (Ontario)



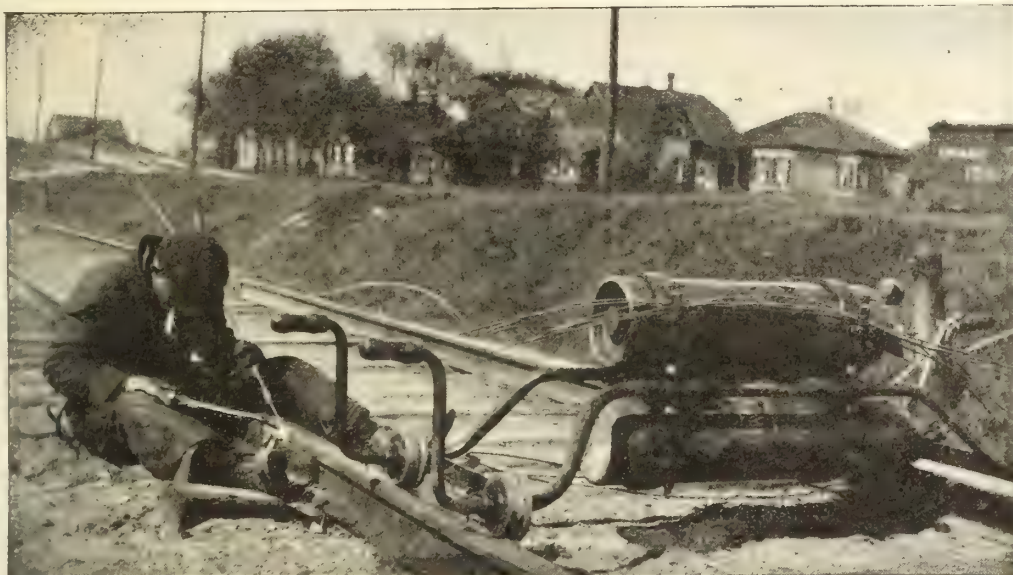
NOMINIGAN CAMP, ALGONQUIN PROVINCIAL PARK

a vacation territory to dream about. It offers canoe trips through myriads of waterways, with ideal camping grounds among forests of pines and balsams.

**2,000 Feet
Above the Sea**

Fine accommodation for those who love the social side of resort life can be had at Highland Inn at Algonquin Park Station, or in the novel and comfortable Log Cabin Camps Nominigan and Minnesing.

Handsomely Illustrated advertising matter and full information supplied free on application to C. E. HORNING, Union Station, Toronto, or to J. QUINLAN, Bonaventure Station, Montreal.



Putting on Permanent Bonds

O-B Gas Weld Bonds have a sure and lasting contact with the rail.
The man who does the welding need not be a skilled workman.
The illustration shows one method of mounting the apparatus.

Write for further details.

The Ohio Brass Company, Mansfield, Ohio

CANADIAN STEEL FOUNDRIES LIMITED

STEEL CASTINGS - MANGANESE STEEL CASTINGS
GRAY IRON AND SEMI STEEL CASTINGS - BAR STEEL
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK

GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
LONDON (ENG.) OFFICE —
— TRAFALGAR HOUSE, WATERLOO PLACE.

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL

How Many Hides Has a Cow?

For shoe soles, one.

But a cow's hide being too thick and stiff for upholstery, is split into at least three sheets, only in the top one of which is natural leather. The lower, fleshy splits, after being coated and embossed to look like leather, and which make up 75 per cent. of all so-called leather upholstery, are really artificial leather of quality inferior to



How Many Hides
Has A Cow?

Use FABRIKOID for: car seat upholstery, curtain bindings, cab cushions and vestibule curtains.

F DU PONT FABRIKOID

REG. U. S. PAT. OFF.

FOR UPHOLSTERING CAR SEATS

It Is Guaranteed Superior to Coated Splits

Its base is a specially woven, very strong cotton cloth. The base of coated splits is a thick, pulpy piece of flesh, much weaker than the cloth. Both are coated with practically the same materials. Both are embossed or grained in the same way.

FABRIKOID is fully guaranteed.

Coated splits are never guaranteed.

If you doubt which is better, compare the "split" upholstery in actual service with the FABRIKOID upholstery, after six months' wear. The proof will be conclusive. Write for Samples and Convince Yourself

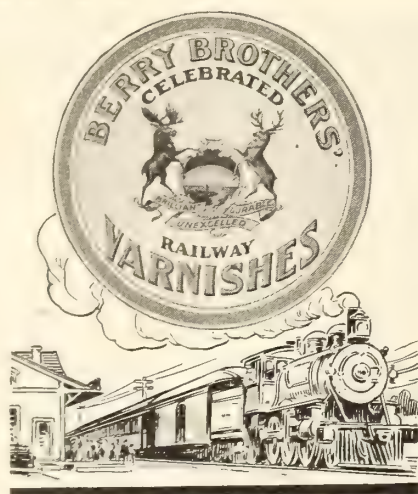
Du Pont Fabrikoid Company

Du Pont Bldg., Wilmington, Del.

Canadian Factory, Toronto, Canada.

WENDELL & MACDUFFIE COMPANY

Railroad Department Representatives, 59 Broadway, New York.



Berry Brothers' Railway Varnishes

Need no introduction to experienced railway men. For nearly 60 years they have been the standard of railway varnish quality and their constantly increasing sale is undisputable testimony of their great efficiency.

Here are a few valuable finishes for railway use.

Inside Coach Finishing

A high grade varnish, very pale, heavy bodied and well matured. It is an easy working, free flowing varnish and dries quickly and hard with an attractive lustre.

Outside Coach Rubbing

A very pale, easy working varnish, dries quickly and can be rubbed in two days.

Inside Coach Rubbing

A superior rubbing varnish, is light in color, dries and hardens quickly, rubs easily and makes an ideal surface for the finishing coats.

Luxeberry Wood Finish

A high grade interior varnish for Stations, etc. Can be rubbed and polished if desired.

Outside Coach Finishing

A pale full-bodied varnish that dries dust free quickly. It is very durable, resisting wear and tear and dries with an attractive lustre.

If you have not already received a copy of our new catalog of Railway Varnishes, write us today, for the best catalog of its kind ever published.

BERRY BROTHERS

(INCORPORATED)
World's Largest Varnish Makers

WALKERVILLE

ONTARIO



Canadian Northern All the Way

From the Laurentians to the Rockies

Serving Canada's National Playgrounds, including

Grand Discharge of the Saguenay: Laurentide National Park: Algonquin National Park: Muskoka Lakes: Georgian Bay Hinterland: Nipigon Forest Reserve: Quetico National Park: Vermillion Lakes: Jasper National Park: and Mount Robson National Park.

All Modern Equipment

Summer Tourist Fares

For Literature and information apply to General Passenger Dept., 68 King St. E., Toronto, Ont., 226 St. James St., Montreal, Que., or Union Station, Winnipeg, Man.



Scientific Treatment of Boiler Waters Dearborn Service to Railroads

Twenty-five years devoted to the subject of water chemistry, embracing the analysis and successful treatment of waters in all parts of America, and in many countries of the eastern continent as well, including supplies used in locomotive, stationary and marine boilers of every type and size, and operated under the varying conditions that obtain in different industries, gives us a background of experience which is of value in handling new problems, and an assurance to our customers that only expert, efficient service will be offered them.

Scores of Railroads are using Water Treating Preparations compounded by us to meet their requirements, with great benefit to the railroad companies, in the increased life of the boilers, reduced consumption of fuel and lubricating oil, ability to haul greater tonnage, increased mileage between boiler washings, and generally improved operating conditions.

We would be glad to analyze the waters on districts where you are having trouble, and advise with you regarding treatment.

Dearborn Chemical Company of Canada, Limited

Office and Works: 1220-1230 Dundas Street, Toronto, Canada



Ever Shaved by a Blunt Razor?

Remember how long it took; how you scraped away, and were finally disgusted with the shave?

Well, that is how a workman feels when using a file that has reached its "inefficient point." He gets irritated—does not take the same pleasure in his work.

The foreman thinks he is slow. There is no satisfaction anywhere.

But, give that man a new file and he puts new enthusiasm and new energy into the job.

This is a homely illustration, but it is true, for it is human nature.

The line of least resistance and greatest efficiency in shop practice to-day is to give men new files to work with when their files reach the "inefficient point."

Manufacturers, suggest to your superintendents,

Superintendents, instruct your foremen,

Foremen, tell your men

to turn in old files the moment they reach their "inefficient point." It costs less for a new file than it does to have a man slowed down and irritated by an old file.

Nicholson File Company

Port Hope

(Dealers Everywhere)

Ontario

Industrial and Contractors Locomotives



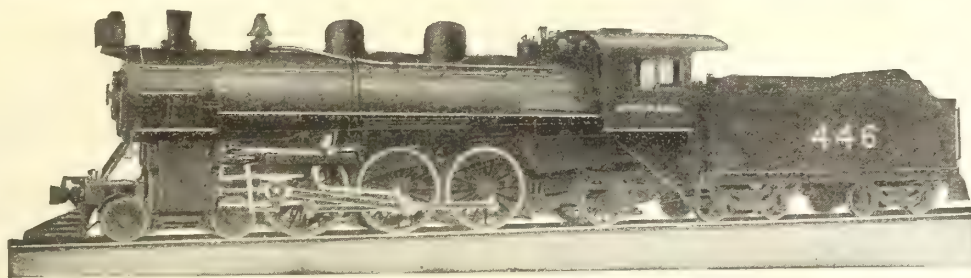
2-4-2 Type Industrial 12"x 16" Cylinder engine, weight 57,000 pounds, Tractive Power 8,900 pounds. The above engine in stock and ready for delivery on short notice.

Canadian Locomotive Company, Limited

KINGSTON, ONTARIO CANADA

Selling Agents, Taylor & Arnold, Montréal P.Q.

Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE—INTERCOLONIAL RAILWAY
Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

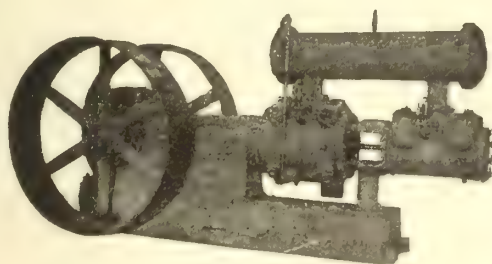
Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

Montreal Locomotive Works, Limited

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

The AIR COMPRESSOR



you decide upon should be the one which will give best and longest all round service.

Ingersoll Rand Compressors

are the most economical to operate and are simple but strong in construction—no unnecessary parts to get out of order.

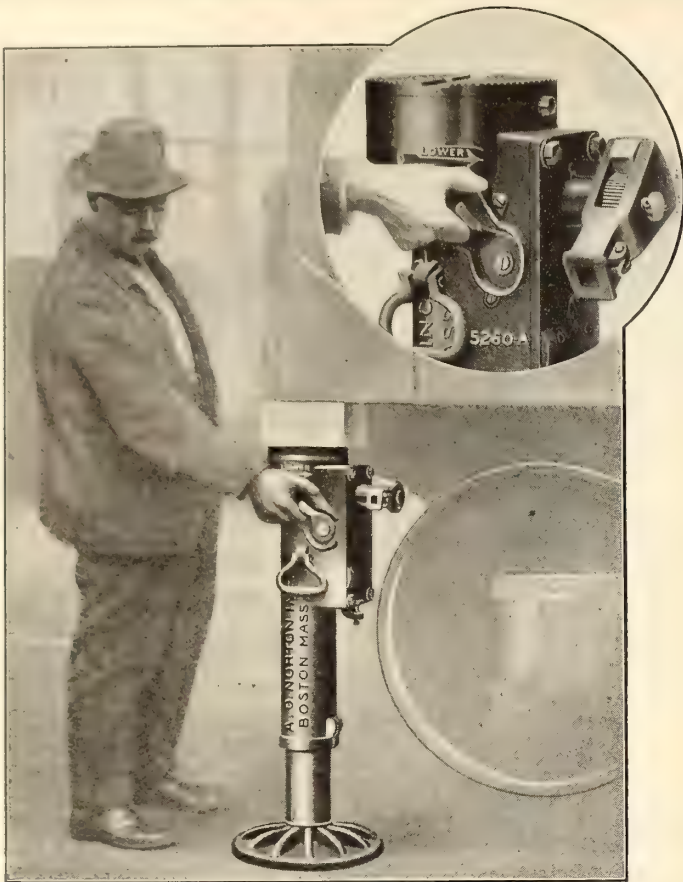
They give best results at lowest operating cost. Let us give you full information on any size.

Canadian Ingersoll-Rand Co., Limited

Commercial Union Bldg., MONTREAL, CANADA

Works: SHERBROOKE, QUE.

SYDNEY TORONTO COBALT TIMMINS WINNIPEG NELSON VANCOUVER



Don't Pump Your Jack Down
Lower the Load by "Pressing the Button"

The Norton Self Lowering Jack

is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

Send for Illustrated Catalogue No. 28,

A. O. Norton, Limited
Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents :
MUSSENS LIMITED

Montreal Toronto Winnipeg Cobalt Calgary
Vancouver




Pedlar's "Perfect" Culverts

are the unquestioned choice of
most railroad boards

BACK of most Pedlar Culvert installations is an interesting story. The need of Culvert strength, culvert resistance, culvert economy have urged men to seek the one most suitable culvert for railroad use.

Pedlar Culverts disclosed the fact that in most cases Culvert repairs are a needless expense.

Made of heavy gauge, anti-corrosive, galvanized  they possess wonderful strength, ductibility and malleability.

Supplied in sizes from 8 in. to 84 in. in diameter and in lengths up to 40 feet—special sizes to order. Coupling bands supplied free for greater lengths.

You should have a copy of the complete Culvert Reference Book No. 4 R.M.

It contains much important data and valuable drainage tables.

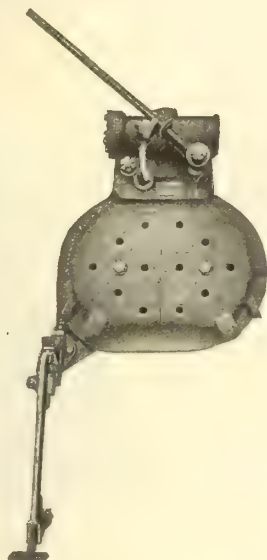
A copy is free. Write.

The Pedlar People, Limited

(ESTABLISHED 1861)

Executive Office and Factories,
OSHAWA, ONT.

Branches : MONTREAL, OTTAWA, TORONTO,
LONDON, WINNIPEG



I WOULDN'T DRIVE A THOROUGHbred WITH A PRIMITIVE HALTER

I'd lose the race if I did.

I wouldn't pay \$10,000 to \$38,000 for an engine

And swing the firedoor by hand.

Franklin Railway Supply Company

30 CHURCH STREET

NEW YORK

332 So. Michigan Ave.
Chicago

625 Transportation Bldg.
Montreal

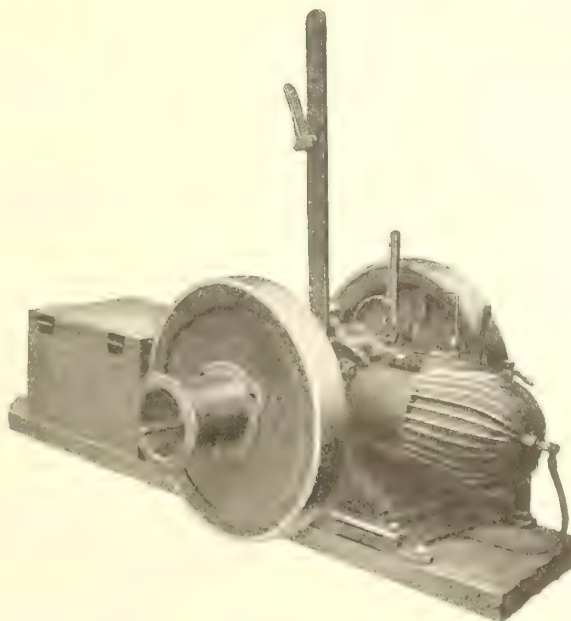
The Air Cooled Jack Canuck Section Man's Engine

Fitted with Air Cooled Cylinder which materially reduces the weight and makes it absolutely reliable under all conditions of weather.

The Air Cooled Jack Canuck is a kerosene engine—a vital consideration with gasoline at the present high prices.

Terms liberal—\$10.00 with the order.
\$10.00 per month until paid for.

Write now for particulars.



The Canadian Fairbanks-Morse Co., Limited

MONTREAL, QUEBEC, ST. JOHN, OTTAWA, TORONTO, HAMILTON, WINNIPEG,
SASKATOON, CALGARY, EDMONTON, VANCOUVER, VICTORIA



Thor

One Piece Pneumatic Long Stroke Riveting Hammer

Made from a solid drop forging with no connection between barrel and handle. Positively no leakage of air.

No Coupling Here



No. 90 Thor Riveter with outside trigger

Most powerful, durable and economical hammer on the market. Especially adapted for marine work. Used by most of the leading shipyards.

Furnished on Trial—FREE.

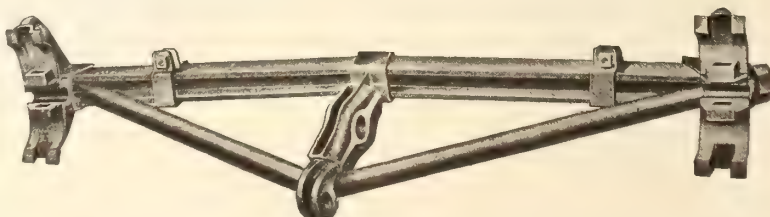
Independent Pneumatic Tool Company
334 St. James St., Montreal, Que.

Canadian Government Railways <div style="font-size: 4em; text-align: center;">4</div> Nationals <i>for</i> Western Canada, Pacific Coast	NEW trains via NEW route, through NEW country making NEW links between the ATLANTIC and PACIFIC <small>connecting HALIFAX - SYDNEY - ST. JOHN with</small> QUEBEC-COCHRANE-WINNIPEG SHORTEST ROUTE - QUICKEST TIME	Canadian Government Railways <div style="font-size: 4em; text-align: center;">4</div> Nationals <i>for</i> Yukon - Alaska
	<div style="display: flex; justify-content: space-between;"> <div> The Western-National <i>Through Observation Sleeping Cars</i> Dep. Quebec 2.00 p.m. Tue. Thur. Sat. Arr. Cochrane 4.10 p.m. Wed. Fri. Sun. Arr. Winnipeg 4.30 p.m. Thur. Sat. Mon. </div> <div> The National Atlantic Dep. Winnipeg 5.15 p.m. Sun. Tue. Thur. Dep. Cochrane 7.15 p.m. Mon. Wed. Fri. Arr. Quebec 9.10 p.m. Tue. Thur. Sat. </div> </div>	
	TORONTO-WINNIPEG <div style="display: flex; justify-content: space-between;"> <div> The National (west bound) <i>Through Sleeping and Dining Car Service</i> Dep. Toronto 10.45 p.m. Tue. Thur. Sat. Arr. Winnipeg 4.30 p.m. Thur. Sat. Mon. </div> <div> The National (east bound) Dep. Winnipeg 5.15 p.m. Sun. Tue. Thur. Arr. Toronto 12.05 p.m. Tue. Thur. Sat. </div> </div>	

Buffalo Brake Beam Company

BUFFALO BEAMS ARE BEST BEAMS

Offices:
NEW YORK
 30 Pine Street
ST. LOUIS
 Syndicate Trust Bldg.
MONTREAL
 195 Commissioner St.



Works:
BUFFALO,
N.Y.

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment

THE STAR BRASS WORKS
KALAMAZOO, MICH.

The Star Brass Works

Largest Exclusive Trolley Wheel Makers in the World.

Kalamazoo

Michigan



Canada Iron Foundries, Limited

Chilled Tread Cast Iron Car Wheels for All Services
Cast Iron Water, Gas and Culvert Pipe,
Flanged Pipe and Specials
Railway Castings

HEAD OFFICE :

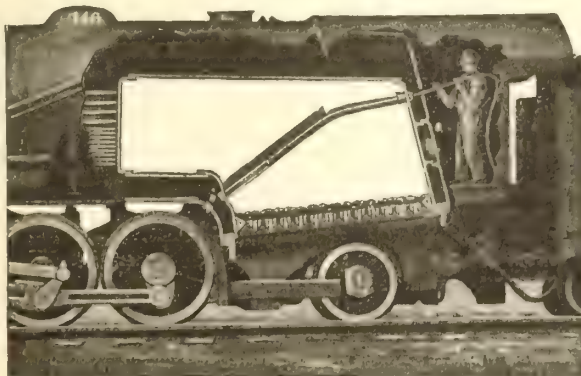
Mark Fisher Building

- - -

Montreal



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes

Lagonda Arch Tube Cleaners

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

Other Lagonda Boiler Room Specialties are described in our General Catalogue L. Send for Copy.

Babcock and Wilcox, Limited

Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Building

The Parmelee Pipe Wrench



Price List C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	3/8, 1/2, 3/4, 1 in.	\$5.00	\$2.25	3/8, 1/2, 3/4, 1 in. \$.75
20 in.	2 1/2	3/4, 1, 1 1/4, 1 1/2, 2 in.	7.50	2.50	3/4, 1, 1 1/4 in. 1.00 1 1/2, 2 in. 1.25
25 in.	3 1/2	1 1/2, 2, 2 1/2, 3 in.	7.50	3.00	1 1/2, 2, 2 1/2, 3 in. 1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Limited

Toronto, Canada

"The Toothless Wonder"

Designed Especially to handle pipes spaced closely as in coil work. No. 2 1/2 wrench illustrated requires but three-quarter inch space between pipes.

Positive Grip instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

Ratchet-like Action. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

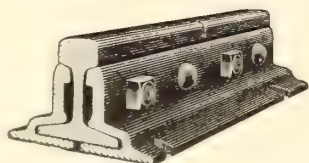
Can't Chew. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

Can't Crush. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.

The Rail Joint Company of Canada, Limited

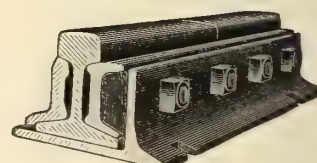
McGill Bldg., MONTREAL

36 Broad Street, London, E.C.

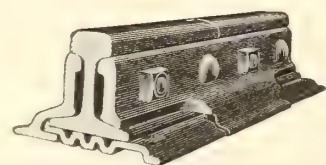


CONTINUOUS

Continuous,
Weber, Wolhaupter and
100 p.c. Rail Joints.



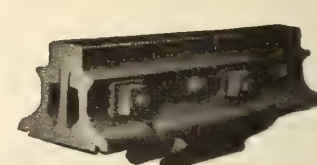
WEBER



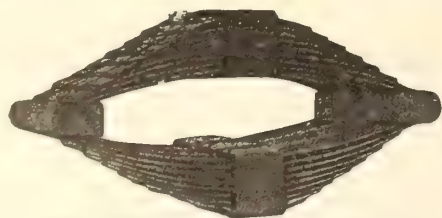
WOLHAUPTER

Standard—Insulated
Step—Frog and Switch
Protected by Patents.

Grand Prize, San Francisco, 1915.



100 p.c.



Triple Elliptic Tender Spring, Cast Ends

Railway Springs

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.
EQUALIZING, DRAWBAR, BUFFER AND SPIRAL SPRINGS of all kinds.
STREET RAILWAY SPRINGS, from the largest to the smallest.

TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE SANDERS, CHAIN, Etc.

Manufactured by

B. J. Coghlin Company, Limited

Montreal, Canada

Dominion Iron & Steel Co., Limited

Manufacturers of

Basic Open Hearth Steel Rails

We will be pleased to have your enquiries for 1916 shipments

Head Offices
and Works

Sydney, Cape Breton, Canada

Have You a Columbia Hot-Shot Battery on Your Speeder and Motor Car?



For absolute reliability and battery economy every railway motor car should be equipped with a Columbia Hot-Shot.

This compact, moisture-proof unit battery is the most convenient and economical arrangement of dry batteries yet devised.

No loose cells to handle—only two connections to make.

Thousands used on railroads everywhere.

Handy, reliable, and economical. The most satisfactory source of ignition current available.

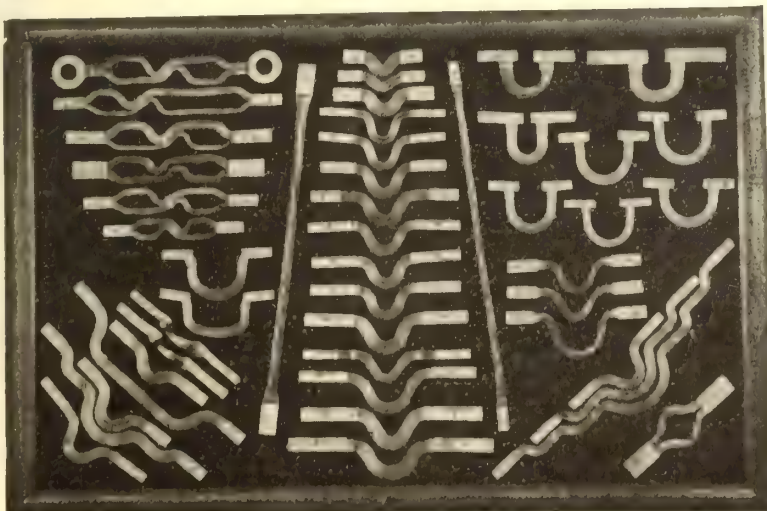
Well adapted also for every other class of battery service.

Made by the largest manufacturers of batteries in the world.

Write for detailed information.

Canadian National Carbon Co., Limited

265 Adelaide Street West, Toronto, Ont.



Electric Weld Rail Bonds

meet every condition.

Neither do they corrode at the terminals.

The Electric Railway Improvement Co.

Cleveland, Ohio

Car Ventilation

Expert Advice is as needful in this as in other matters of Car Construction. Is not the experience of twelve years, devoted exclusively to this field, worth anything to you? We have it, and it is yours for the asking.

CAR VENTILATORS of all types at prices from \$1.50 up.

For information address

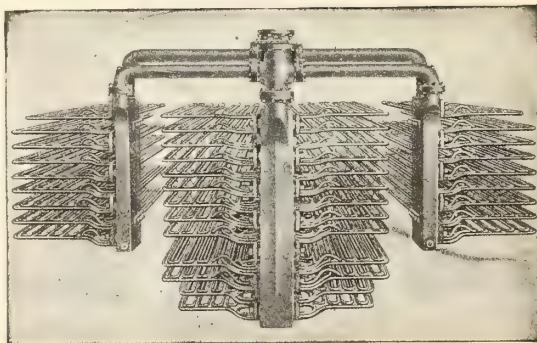
Automatic Ventilator Company

No. 2 Rector Street

New York, N.Y.

Fire Tube Marine Superheater -- Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler h.p. from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, New York, N.Y.

Peoples Gas Bldg., Chicago, Ill.

Dominion Iron & Wrecking Company

LIMITED

Railway Equipment, Rails and Machinery

Dismantlers of BRIDGES, PLANTS, STEAMERS, MILLS
Dealers in IRON, STEEL, SCRAP METALS

General Offices: Transportation Building
TORONTO

QUEBEC

MONTREAL, QUE.
ST. JOHN, N.B.

Are You in the Market for Trolley Catchers, Retrievers, Bases or Head Lights

We manufacture Knutson No. 5 Trolley Retriever, Knutson No. 2 Trolley Retriever, The Ideal Trolley Catcher, The Simplex Trolley Base, The Peerless No. 10 Roller-bearing Trolley Base, The Peerless Check Valve, The Peerless Junior Head Light, The Perfect Head Light, The Hollis Safety Fender, No. 3 Detachable Fender.

Write our Canadian Representatives Allen General Supplies, Limited they will be pleased to give you complete information as to any of the above as well as our other lines.

Trolley Supply Company, Canton, Ohio

Address all correspondence to Allen General Supplies, Limited, 205 Yonge St., Toronto



REAMERS

Cutters, Taps, Dies
and Drills

"P. & W. Co." Insures **QUALITY**

See that it is on the tools you buy.

Pratt & Whitney Co. of Canada, Limited

Dundas, Ontario

Vancouver

Montreal

Winnipeg

ALGOMA STEEL CORPORATION LIMITED

STEEL RAILS
PLICE BARS
STEEL TIE PLATES

PIG IRON
BASIC & BESSEMER



STRUCTURAL SHAPES
STANDARD MERCHANT
BARS

BLOOMS BILLETS
& SLABS

SAULT STE. MARIE, ONT. CANADA.



High Grade Qualities

When buying or recommending Dominion Rubber System products you can depend upon high-grade qualities. That protection is being appreciated more and more by users of Rubber Goods, no matter for what purpose the need may be.

High Grade Qualities Our First Consideration

Dominion Rubber System qualities combined with Dominion Rubber System value and service, make it well worth your while to insist on having Dominion Rubber System products.

If you cannot get what you want, write to our nearest branch, or to our Head Office, where your request will receive prompt and courteous attention.

Canadian Consolidated Rubber Co., Limited
Montreal, P. Q.

28 "Service" Branches Throughout Canada.

Canadian Railway and Marine World

August, 1916.

The Board of Railway Commissioners' Judgment in the Eastern Rates Case.

The Board of Railway Commissioners' judgment in the Eastern Rates Case which was promulgated July 6, sanctions increases in freight rates in Eastern Canada, but does not allow all the increases asked for. Each rate has been considered on its merits. Following is a summary: It was not until May 11 of this year that the increases in grain and grain products rates were withdrawn by the railways, after negotiations resulting from the Board being impressed by the effect of the short mileage of the National Transcontinental, and competitive conditions between that line and the Canadian Northern north of the Ottawa. This affects a large item.

Operating expenses have increased generally. While from 1899 to 1914 train mile earnings increased 89%, the cost of service per train mile increased 112%, notwithstanding economies attributable to increased locomotive power, lower grades, better loading and increased traffic. In the period 1910 to 1914, earnings increased 10.6%, expenses 17.7%. In 1915, earnings increased 5.3% expenses 12.4%. Railway ties cost 38% more in 1914 than in 1907; in 1915 they were 45% higher. The cost of fuel to operate 100 miles was 30% higher in 1914 and 1915 than in 1907. The average cost of fuel increased 21.8% in the period 1909 to 1914. Salaries and wages represent three-fifths of the total railway expenses. This item has increased rapidly. The wage bill of the Grand Trunk alone increased in the period 1909 to 1914 by 52%, and for 1915 the increase was 50%. The increase in labor cost is mainly due to increases in wages, as there have been economies in the number of men employed per 100 miles of track. Decreases in wages are not a feasible means of economizing. The wages on the Grand Trunk have increased by 4.3% since the hearing.

The Canadian Pacific divisions in Eastern Canada are the Atlantic, Eastern, Ontario and Lake Superior. The Atlantic Division is operated at a loss. There is but little local traffic on the Lake Superior Division. The Canadian Pacific and the Grand Trunk are both engaged in business in the Eastern and Ontario Divisions, and here the freight business of the Canadian Pacific gives only 20% of its total freight revenue, and represents only three-fifths of the business done by the Grand Trunk. The Grand Trunk was built to meet the needs of Eastern Canada. It runs into all the large producing centres; it has a well established and well worked up business. In Eastern Canada it does the largest business and obtains the greatest earnings.

It is fair to accept for primary consideration the actual results of the Grand Trunk's earnings as a basis of rates. The rates cannot be based on the total capital cost of the Grand Trunk as carried on the company's books, which would represent a cost of \$131,000 a mile. The Canadian Pacific's new lines from Glen Tay to Agincourt and from Toronto to Sudbury cost respectively \$71,000 and \$56,000 a mile. This includes nothing for terminals. The Intercolonial cost,

including equipment and terminals, \$75,000 a mile. The Hydro-Electric Power Commission of Ontario has recently made an estimate that 138 miles between Toronto and London would cost \$100,000 a mile, including terminals and equipment.

The net earnings per mile of line of the Grand Trunk at their highest in 1913 were \$3,500 a mile. In 1914, they were \$3,059, and in 1915 \$2,477. The financial relations of the Grand Trunk to the Grand Trunk Pacific, as well as to its United States lines, are analyzed, and it is rule that outside investments cannot be considered as bearing on the reasonableness of freight rates. Economical financing of the Grand Trunk has been rendered extremely difficult, if not impossible. Appropriations of all kinds have been cut and repairs have been postponed. On Dec. 31, 1915, over 4000 cars were held for repairs, notwithstanding the lighter traffic of the year. In order to keep the equipment in proper shape, it will be necessary to obtain 1,249 new freight cars at an expenditure of \$2,238,000. Normal track renewals would require 431 miles; for the period 1913 to 1915, inclusive, the track renewals were only 45% of this standard; and for the year 1915 the renewals fell to 67 miles. The renewal work on bridges and culverts during 1915 is \$20,000 below the average yearly expenditure of the period of 1906 to 1915. The economies so made cannot continue indefinitely without great loss and inconvenience to the public.

In the Western Rates Case, the Government expert computed that 6% should be allowed so as to provide 4% for interest charges and 2% for surplus. Money is now more expensive. Taking the cost of the Glen Tay-Agincourt line and adding \$10,000 a mile for equipment, the net earnings would have to be \$4,800. If the Toronto-Sudbury line is taken as a basis, net earnings per mile would have to be \$4,001; while if the Intercolonial is taken they would have to be \$4,500. Aside entirely from the terminal expenses, the Grand Trunk net earnings in the best year are far short of these figures.

The proposed increases on fruits are postponed until they can be considered along with proposed increases in icing and salt for refrigeration, which are now under suspension.

The Western Rates Case pointed out the differences between conditions in Eastern and Western Canada; and, notwithstanding material reductions, the general schedule in the west is higher. The Railway Act requires and the general public interest of the country demands that, if practicable, eastern rates should be advanced so that the different schedules may more nearly approach a parity. The effect of new competing lines, e.g., the Canadian Northern, constructed recently, is not considered in striking a reasonable basis. The increases made are justifiable entirely on the mere fact of the increases in Grand Trunk expenses, and having regard to traffic of normal years.

Besides the class tariffs of general application, meaning the rate scales used

everywhere in connection with the Freight Classification, the application of the railway companies comprises over 150 exceptional or special single rates and more or less comprehensive schedules of exceptional rates, lower than the class rates, applicable to various commodities. To quote the judgment: "No flat increase of 5, 10 or other percentage could be applied simply to augment railway revenue. Each rate of necessity has to be considered, having regard to its reasonableness for the service performed." As each of these items has thus been separately dealt with on its merits, it is impossible within the limits of a newspaper article to give any clear synopsis of the Board's conclusions. A selection of two or three commodities, by way of illustration, would convey no true conception of the general result and might prove misleading. The shippers interested in the several lines of trade represented in the application will arrive at their own conclusions from a study of this section of the judgment. The application with respect to some of the commodity items has been declined, and in numerous instances less has been granted them than asked for by the railway companies.

The findings regarding the class tariffs may however, briefly be summarized. In the territory bounded on the west by, but not including, Port Arthur, and by the Georgian Bay, Lake Huron and Detroit river, and on the east by Quebec and Megantic, also between C.P.R. stations in New Brunswick, the class rates, provided they are now lower than the standard or maximum mileage tariff, may be increased by 2c. in the 1st and 1c. in the 5th classes, the rates for the other classes to be properly proportioned in accordance with the standardized scale. An exception is made of the Canadian Pacific and Canadian Northern lines between Parry Sound and Sudbury, on which no increases are allowed.

Because of the comparatively lower level of the rates to the Maritime Provinces, greater increases are permitted. Between points in the provinces of New Brunswick and Nova Scotia and points west of Quebec, Levis and Megantic as far as Montreal and Valleyfield, and north of the Ottawa river, the 1st class will be advanced 4c. and the 5th class 2c.; the other classes in proportion. Between the same maritime sections and points west of Montreal the carriers are authorized to increase their rates by 6c. for the 1st class and 5c. for the 5th, the remaining rates fitting in from the standardized scale. Here, again, an exception is made of the C.P.R. line in the St. John river valley, where the rates, instead of being advanced, will be lowered by the company so as not to exceed the St. John rates; this relief being due to the opening of the National Transcontinental south of Edmundston, N.B. As the government railways are not subject to the Board's jurisdiction, the Intercolonial and National Transcontinental management is, of course, free to fix its own rates; nevertheless, the judgment provides that the through rates of the Grand Trunk, Cana-

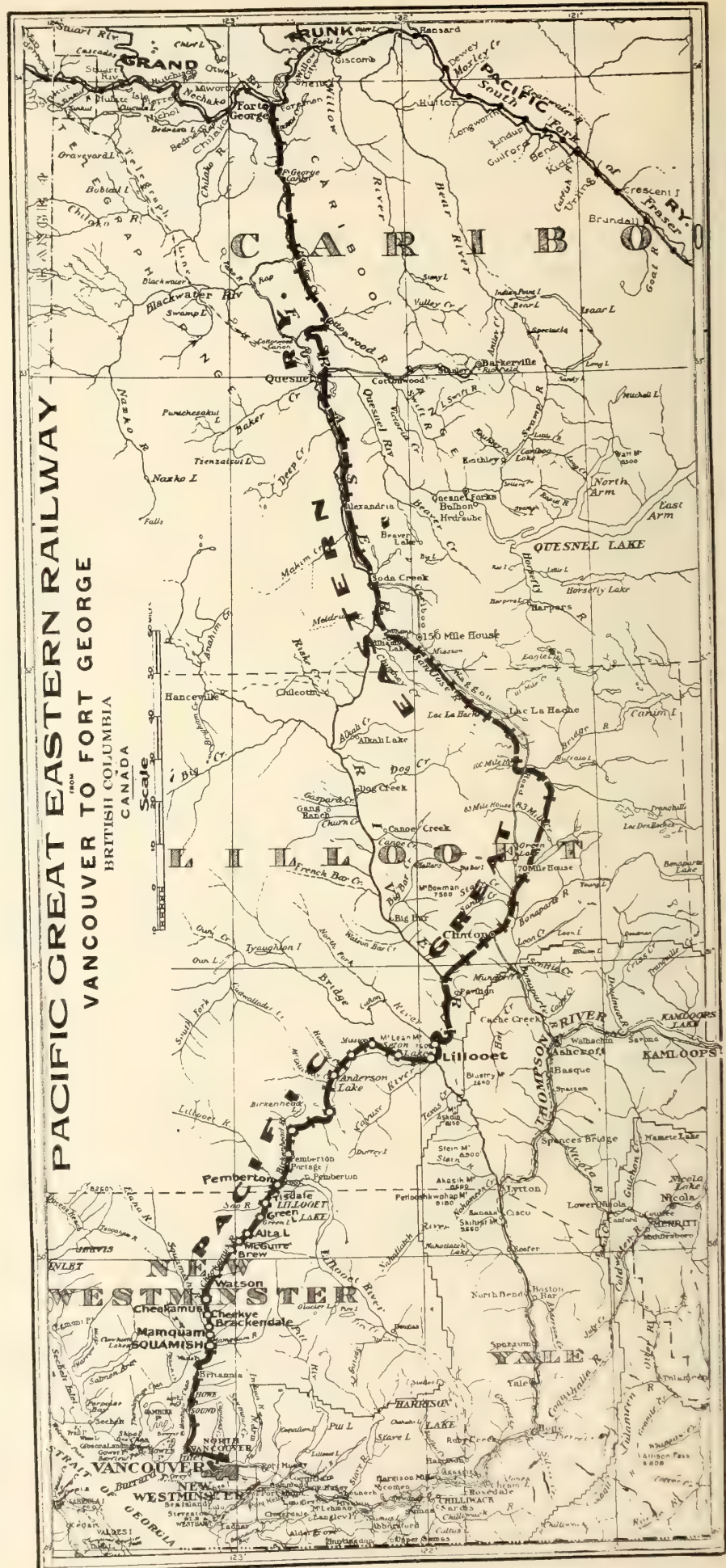
dian Pacific, and other independent companies in Quebec and Ontario, to Intercolonial points east of St. John to Halifax and Sydney are to preserve the same differences, if any, over the St. John rates as at present.

The Board's judgment and order occupies 256 pages 5 x 8 in. of closely printed matter.

The Pacific Great Eastern Railway's Location and Construction.

The Pacific Great Eastern Ry., which was projected to form the connecting link between the Grand Trunk Pacific Ry.'s transcontinental line and the city of Vancouver, will upon completion serve a vast extent of local territory adapted to agricultural, mineral and other development; and while providing a convenient through route to Vancouver and other southern cities will constitute an avenue of traffic to market for the products of the interior.

From Vancouver the line follows the north shore of Burrard Inlet and English Bay, and the east shore of Howe Sound, to its head, about 44 miles from Vancouver. At the head of Howe Sound is Squamish, the company's ocean terminus. Howe Sound forms a magnificent land locked harbor 25 miles long and at its narrowest point not less than a mile wide. The harbor is claimed to be the most commodious on the Pacific coast, having regard to freedom from currents and winds and the safe anchorage that it affords, there being no obstruction of any kind to navigation throughout its entire length. The Pacific Great Eastern management believes that Squamish will be one of the most active ports on the western coast, as it will form the virtual Pacific terminus of the G.T.P.R. transcontinental line (the other Pacific terminus of that line at Prince Rupert serving more as a link in transpacific traffic to the Orient); and from the local traffic that will be developed along the Pacific Great Eastern Ry., which, passing in a north and south direction through the central part of the province, will render commercially available the vast natural resources of the territory adjacent to it, agricultural, mineral, and industrial, including lumber. The mineral tonnage alone is expected to prove an important source of revenue to the company. With the extension of the present dock and the construction of grain elevators, the company expects to handle at Squamish a large volume of Prairie wheat, which it is becoming increasingly evident must find western outlets, partly to meet the growing Oriental demand for Canadian wheat, and to shorten the rail haul. It is contended that in the near future the bulk of the wheat crop produced west of the 110th meridian of west longitude (the eastern boundary of Alberta) will reach its markets through Pacific rather than Atlantic ports. That this is possible is due to several important factors of which the following three are perhaps the most worthy of mention: 1, the favorable grades obtained by the Grand Trunk Pacific, the Canadian Northern and Pacific Great Eastern through British Columbia, and the improvements recently effected in the Canadian Pacific grades across the Rockies; 2, the construction of the Panama Canal; 3, refrigeration in grain carrying ships, preventing the sweating of wheat while passing through tropical waters. Steamships now ply regularly between Vancouver and



Squamish, connecting with the P.G.E.'s trains at the latter point.

Leaving Squamish, the line passes for a short distance through the extremely fertile Squamish River Valley, an interesting and valuable product of which is the hop crop. Flowing into the Squamish River is the Cheakamus, which the railway follows through some of the best timber lands in the province, which investigators state are also highly mineralized. Scenically this is a beautiful section, of river, waterfall, forest and mountain heights. It has also excellent shooting and fishing. From the Cheakamus Valley the line follows a chain of lakes and rivers, and passes through Pemberton meadows, comprising stretches of beautiful farm land. An experiment is being made there, under the direction of the British Columbia Government, in the raising of sugar beet, as it is believed that the soil and favorable climate are well adapted for the industry. Leaving Pemberton meadows the line follows the Birkenhead River through country very similar to that adjacent to the Cheakamus River. It thence continues northerly around the west shores of Anderson and Seton Lakes, and enters Lillooet, celebrated in the early days of the province for the rich gold washings along the banks of the Fraser River at that point, but now more justly renowned for its fine quality of fruit and melons. At Lillooet the line crosses to the east bank of the Fraser River, which it follows northerly to Kelly Lake, and thence runs in a more northeasterly direction to Clinton, the present (July, 1916) end of track, 167 miles from Squamish. From Clinton northerly until the line again approaches and follows the Fraser River the country is open, and adapted to mixed farming and ranching. Most of the land, however, requires irrigation, although dry farming has been successfully carried on. From Soda Creek the line follows the Fraser River to Prince George, where it will connect with the Grand Trunk Pacific main line. Grading is practically finished over the whole line, and although no portion of the line north of Clinton is being operated, track-laying is proceeding as rapidly as possible. Owing to the great number of bridges and the amount of trestle work in the first 8 miles, progress is necessarily slow, and it is not expected that track will be laid to Prince George until the end of 1917.

From Prince George the company's next objective is the Peace River country, where it is estimated there are 7,500,000 acres available for settlement, with excellent climate and fertile soil, adapted both for raising grain and mixed farming. It is not likely, however, on account of present economic conditions, that work will be started on this extension before next year or probably later.

The location of the Pacific Great Eastern was determined after the company's engineers had studied all previous surveys through the territory, had exhausted all other available sources of information as to possible routes, and had carefully investigated the country by actual survey. In deciding upon the route adopted, the engineers were guided by considerations of probable future operating expense and revenue; as well as the initial cost of construction. The line adopted is suitable to the character of country traversed. The gradients and curvature, while not as low as those on the Canadian Northern and Grand Trunk Pacific, are said to be more favorable than on the Canadian Pacific's main line through British Columbia, and are greatly superior to those of the Santa

Fe, over which a tremendous volume of business is handled.

A high standard of construction was set and is being maintained throughout the entire work. The embankments are wide; drainage has been well provided for; all structures in the roadbed are designed to carry the heaviest rolling stock; and the few short tunnels have been well taken out to standard dimensions. The rails on level ground and light grades are 60 lb. to the yard, but 70 lb. steel is used on the heavier grades. A good quality of ballast is generally available conveniently near to the line and is being well distributed under the track, so that in every essential detail the road is a good one.

At Squamish a terminal yard has been laid out and a 6 stall locomotive house constructed to meet present requirements, and an oil fuel station installed. At Lillooet, the next division point, similar facilities are being furnished. Oil fuel is to be burned in the locomotives. An abundant supply of good water is available, so that with the oil fuel and suitable water the railway should be singularly free from boiler trouble.

J. W. Stewart, of Vancouver, a member of the firm of Foley Bros., Welch and Stewart, and D'Arcy Tate, K.C., of Victoria, are the President and Vice President respectively of the company. John Callaghan is its Chief Engineer.

Birthdays of Transportation Men in August.

Many happy returns of the day to:—

V. T. Bartram, ex-Purchasing Agent, Timiskaming & Northern Ontario Ry., now of Toronto, born at Ottawa, Aug. 2, 1880.

J. C. Beckwith, Engineer of Construction, Canadian Government Railways, Moncton, N.B., born at Fredericton, N.B., Aug. 1, 1875.

C. B. Brown, M.Can.Soc.C.E., Chief Engineer, Canadian Government Railways, Moncton, N.B., born at Ithaca, N.Y., Aug. 27, 1879.

J. S. Carter, District Passenger Agent, C.P.R., Nelson, B.C., born at Aurora, Ill., Aug. 14, 1864.

A. E. H. Chesley, General Accountant, Dominion Atlantic Ry., Kentville, N.S., born near Annapolis Royal, N.S., Aug. 27, 1877.

A. B. Chown, Travelling Passenger Agent, G.T.R., Pittsburg, Pa., born at Belleville, Ont., Aug. 4, 1887.

G. T. Coleman, Car Service Agent, Ontario Division, C.P.R., Toronto, born at Carleton Place, Ont., Aug. 25, 1875.

C. H. N. Connell, Engineer Maintenance of Way, Quebec Grand Division, Canadian Northern Ry., Montreal, born at Woodstock, N.B., Aug. 26, 1876.

C. E. Croft, Chief of Commissary Department, Canada Steamship Lines Ltd., Toronto, born at Cobourg, Ont., Aug. 26, 1882.

E. L. Desjardins, Assistant Superintendent, Montreal and Ste. Flavie District, Intercolonial Ry., Riviere du Loup, Que., born at St. Jean Port Joli, Que., Aug. 1, 1859.

L. C. Frith, General Manager, Eastern Lines and Assistant to President, Canadian Northern Ry., Toronto, born at Springfield, Ill., Aug. 11, 1869.

G. H. Ham, Head Office Department, C.P.R., Montreal, born at Trenton, Ont., Aug. 23, 1847.

W. P. Hinton, Traffic Manager, Grand Trunk Pacific Ry., Grand Trunk Pacific Coast Steamship Co., and Western Traffic Manager, Canadian Government Railways, Winnipeg, born at Hintonburg, Ont., Aug. 30, 1871.

R. Kerr, ex-Passenger Traffic Manager, C.P.R., born at Toronto, Aug., 1845.

C. T. Knowlton, Superintendent of Ferries, Canadian Government Railways, Moncton, N.B., born at Advocate Harbor, N.S., Aug. 26, 1849.

J. D. McDonald, Assistant General Passenger Agent, G.T.R., Chicago, Ill., born at Toronto, Aug. 27, 1855.

T. McHattie, Master Mechanic, Eastern Lines, G.T.R., Montreal, born at Dufftown, Banffshire, Scotland, Aug. 8, 1854.

M. K. McQuarrie, Resident Engineer, District 1, British Columbia Division,

C.P.R., Revelstoke, born at Sault Ste. Marie, Ont., Aug. 17, 1884.

A. H. Mahon, District Locomotive Foreman, Grand Trunk Pacific Ry., Edson, Alta., born north of Ottawa, Ont., Aug. 27, 1874.

W. J. Meakin, Car Foreman, C.P.R., Wetaskiwin, Alta., born at Toronto, Aug. 22, 1872.

C. Montgomery, Master Mechanic, Pere Marquette Rd., St. Thomas, Ont., born near London, Ont., Aug. 29, 1860.

W. E. Mullins, General Manager, (Freight), United Fruit Co., New York, born at Stratford, Ont., Aug. 13, 1870.

H. R. Naylor, Division Car Foreman, Eastern Division, C.P.R., Montreal, born at Hull, Eng., Aug. 30, 1885.

F. H. Phippen, K.C., General Counsel, C.N.R., Toronto, born at Belleville, Ont., Aug. 26, 1862.

W. M. Porteous, District Freight Agent, C.P.R., St. Louis, Mo., born at Edinburgh, Scotland, Aug. 3, 1857.

J. F. Richardson, ex-Superintendent Telegraphs, Saskatchewan Division C.P.R., born at Granby, Que., Aug. 23, 1861.

W. G. Ross, Chairman, Montreal Harbor Commissioners, born at Montreal, Aug. 6, 1873.

W. Le B. Ross, Local Treasurer, G.T. Pacific Ry., Winnipeg, born at Ottawa, Ont., Aug. 9, 1868.

F. C. Salter, European Traffic Manager, G.T.R., and Canadian Ex. Co., London, Eng., born at Sarnia, Ont., Aug. 31, 1863.

A. O. Seymour, General Tourist Agent, C.P.R., Montreal, born at Ogdensburg, N.Y., Aug. 14, 1887.

S. A. Simpson, Superintendent, Sleeping, Dining and Parlor Cars and News Service, C.P.R., Winnipeg, born at Toronto, Aug. 22, 1880.

J. F. Sweeting, Industrial Agent, Natural Resources Department, C.P.R., Calgary, Alta., born at Worthing, Eng., Aug. 20, 1872.

F. E. Warren, General Car Foreman, C.P.R., Winnipeg, born at Chelsea, Que., Aug. 29, 1872.

W. B. Way, Superintendent, District 2, National Transcontinental Ry., Cochrane, Ont., born at Bowmanville, Ont., Aug. 22, 1867.

E. H. Williams, Locomotive Foreman, Canadian Northern Ry., Brandon, Man., born at West Toronto, Ont., Aug. 26, 1884.

The G.T.R. tunnel under the St. Clair River at Sarnia, Ont., was flooded July 21, owing to very heavy rains, there being a depth of 4 ft. in it. Traffic was interrupted and a number of trains were dispatched via Windsor.

Railway Mechanical Methods and Devices.

Stripping Spring Buckles at Grand Trunk Railway Shops.

The accompanying illustration shows a spring buckle stripping press in use in the G.T.R. shops, Stratford, Ont., which has a capacity of about 6 springs an hour, and is, in consequence, a big im-



Machine for Stripping Buckles from Locomotive Leaf Springs.

provement on many of the generally accepted methods of stripping buckles. It consists of a heavy base and cylinder cast integral, the cylinder operating with an air pressure. At the end opposite to the cylinder there is a heavy vertical flange from the base, against which the springs rest. A crosshead, guided on ways along the upper face of the base, carries two heavy bars, which may be adjusted laterally for different widths of springs, these bars spanning the spring. They are kept close against the side of the spring, during operation, by a clamp. Spanning the base beyond these arms is a heavy forged bridge, with a heavy square threaded screw centrally in the cross arm, set at a slight angle away from the cylinder. This cross arm moves in ways along the side of the base, for adjustment for various sizes of springs, preventing the spring from vertical buckling.

The spring to be stripped is placed on the table of the base, the side arms placed against the buckle and clamped together, and the screw in the top of the cross arm tightened down. The air pressure in the cylinder then forces the band off the spring in one movement. Most of the time is consumed in setting up the spring for operation, but, even with that, the high rate of production mentioned above is easily maintained.

Locomotive Washing at Lambton Yard, Canadian Pacific Railway.

Outside of the locomotive house at Lambton, near Toronto, about 50 ft. from the approach to the turntable, a washing floor is constructed, as shown in the accompanying plan. The ordinary practice of using a mixture of air, water and oil is followed, from a tank and hydrant, situated about the centre of the washing floor, between the two parallel tracks which run through the floor. Water and air pressure are supplied at about 60 lb. pressure, so that the nozzle throws a fine spray, which cuts off the

dirt and grease and leaves a coating of oil all over the sprayed portion.

The track bed is drained from the centre, between the rails to the outside, and a parallel trough about 6 in. deep carries the surplus water and oil to a point about 20 ft. away, where a concrete trap tank is located. This tank is 2½ ft. wide by 4 ft. deep, and is drained from the bot-

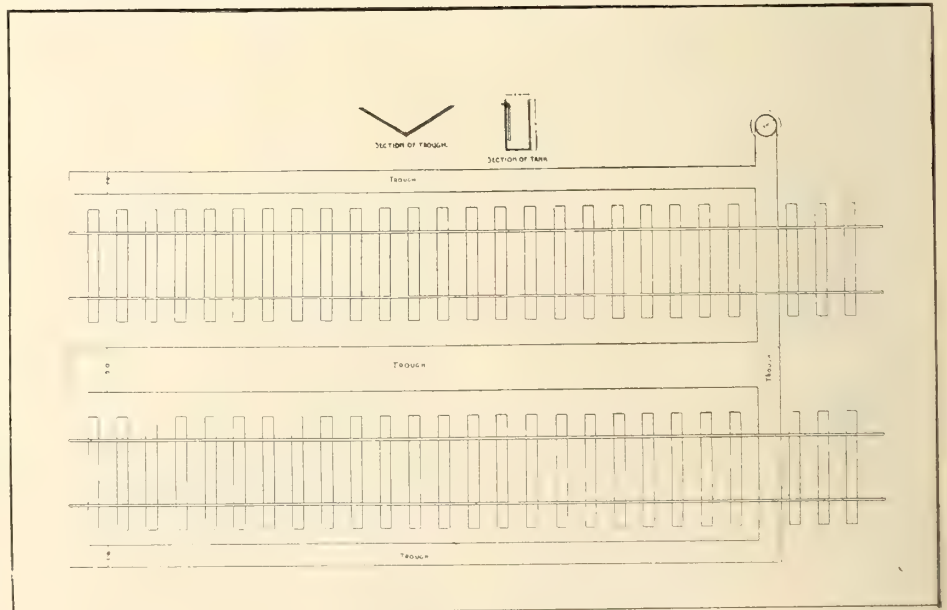
Savings Effectuated by Welding in Railway Shops.

The following information has been received in response to requests from Canadian Railway and Marine World:—

G.T.R. Shops, Point St. Charles, Montreal.—A. A. Maver, Master Mechanic, writes: When we first started to use Thermit welding, about the time when it was first introduced, we were told that the parts to be welded did not require to be heated. We were also restricted to the amount of Thermit to be used; but, after having had some experience, we find that to obtain the best results plenty of Thermit had to be used, in order to give a good flow through the mould. We also found pre-heating to be necessary for successful Thermit welding, as the hotter the parts to be welded the more successful will the weld be.

For relining crucibles, magnesia tar should always be used. In some cases, when we did not have magnesia tar on hand, we have lined our crucibles with old brass crucibles, fire clay, and sand, but found the sand would mix with the metal, making a silicon, thus causing the steel to become very hard and brittle, and liable to break. In Thermit welding the most important things to be seen to are to have the crucible properly lined, to use plenty of Thermit, and to have the parts to be welded as hot as possible.

Oxy-acetylene welding has been used very extensively in the Point St. Charles shops for a large variety of work during the past seven years, motion plates, spectacle plates, etc., and locomotive frames being built up where worn away by stays or brake hangers. Flat spots on tires are successfully welded in their place, mis-drilled holes filled up, faulty castings re-



Track Troughs for Locomotive Washing.

reservoir to the washing machine, allowing the oil to run right into the machine over and over again.

It is estimated that this process reclaims 66% of the oil used for washing down, and keeps a yard much cleaner than when the oil and water are allowed to soak into the ground. We are indebted for the above information to E. J. Murphy, Locomotive Foreman, C.P.R., Lambton, Ont.

claimed, and shop machinery repaired. We have also repaired cast iron parts of machines and welded lugs on steam shovel cylinders, etc. A large percentage of the above material would have been scrapped but for our ability to reclaim it by this welding method.

All cast iron articles to be welded should have the cracks or broken parts chamfered to a 45° V, leaving just about ¼ in. fitting edge, according to the size

of the castings, and then be heated up slowly in a charcoal fire to a red heat, and as soon as the welding is done the article should be buried in ashes till it has cooled right down. We find this to be the only way to make a reliable job.

Three years ago the water chamber of a hydraulic pump (steel casting), subjected to a pressure of 3,000 lb. a sq. in., opened up pores, and part of the valve face was cracked. It was successfully welded, and has been in constant use ever since.

Whenever possible all heavy parts to be welded should be pre-heated, as it saves time and gas, and makes a more homogeneous joint.

In boiler work, all sorts of patches and cracks, also half and side sheets, are successfully welded, and metal built upon wasted foundation rings, dry pipe joints, etc., all patches, cracks, and side sheets being chamfered to a 45° V.

Cutting by the oxy-acetylene process on steel or wrought iron saves many hours of labor. For example, a fire box side sheet can be cut across and down the centre in twenty minutes, and a fire hole patch measuring nine feet can be cut in the same time.

G.T.R. Shops, Battle Creek, Mich.—J. C. Garden, Master Mechanic, writes: We have used Thermit for a number of years, with very good results. When we first got the machine our welds were not satisfactory, although we followed closely the instructions issued by the Thermit representative. The material at the weld was hard and brittle, and, with very few exceptions, the welds broke before they had been any length of time in service. I explained this to one of their representatives who called on me, and he asked to be allowed to watch us make a weld, which I permitted him to do. Before we got well started he said that it would be impossible for us to make a proper weld under the conditions we were using; that the material with which we were lining our crucibles would destroy any weld, the crucible being lined with carborundum and silicate of soda, the metal passing through this carborundum would pick up sufficient carbon to make it as hard as glass. We asked him what was required, and he told us to line the crucible with a special preparation of tar. He also advised that the Thermit mixture we were using was not suitable, as it was put up in a big can and the matter separated, the lighter portion coming to the top so that the mixture would not be correct. He advised that we should stir the whole body of this mixture every time we used it, but recommended that we procure the mixture in small cans, which should be freely shaken before being used. We followed his instructions and our Thermit welds afterwards were perfectly satisfactory, the metal being soft enough to machine or cut with a hammer and chisel, and since adopting this system we have never had a weld break.

We are also getting very good results with electric welding, especially on locomotive frames, but the success of this welding also depends on using the proper material. If the proper grade of iron is not used it will be hard and break. We use the Thermit machine for very little except locomotive frames, but on one or two occasions we welded cast steel wheels which were broken in the spokes, to save time in procuring the wheel. The results in both cases are equally satisfactory.

With the electric welder we weld broken cylinders, if they are broken in the cavity, which takes only exhaust steam, but we have not been able to weld satis-

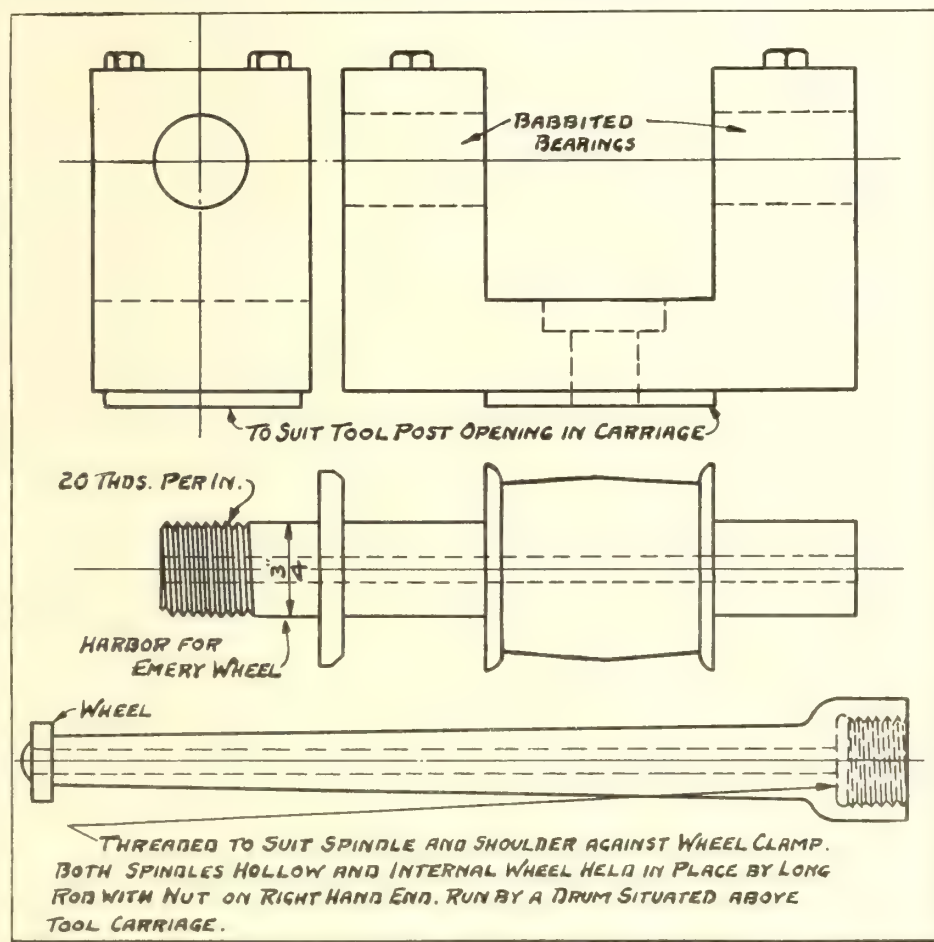
factory on the high pressure cavities. We weld frames and all iron and steel parts on locomotives, cracked bridges in tube sheets, patch in fireboxes, and fill staybolt holes, which have been worn large, for retapping. We have also been very successful in repairing high speed milling cutters—in fact, the number of purposes for which this machine can be used is unlimited.

Canadian Northern Railway, Winnipeg Shops.—L. Wedge, General Locomotive Foreman, writes as follows: Four men are continuously employed by us on oxy-acetylene welding, which we find very satisfactory, two men doing the boiler work and two doing machine work. With this

greater saving was made in material than if the cylinder had pieces broken out of the front 12 in. long and 16 in. wide, U shape.

Welding flat spots on driving tires is a practice which is also a great saving in both time and material, as it is not necessary to lift the locomotive off the wheels or to turn the tires, which necessarily shortens their life by some 12 months or more, depending on the size of the socket.

The above are only a few of the important jobs done by welding in this shop, but the fact that we keep four men continuously on this work will give an idea of how much we accomplish by this process of welding.



Long Arm Grinder

Long Arm Grinder on Grand Trunk Pacific Railway.

A useful attachment for motion and general grinding is shown by the accompanying illustration. The saddle block is formed to suit the tool post opening in carriage on lathe, to which are attached two hollow spindles, one operating in babbited bearings and saddle block and fitted with drum, which is belt connected to an operating shaft above the tool carriage. The main spindle carries a 2 in. arbor for an emery wheel, and is locked firmly by the extension spindle, which is screwed into place as shown, being further held by a long rod carrying small outer wheel on right hand end and terminating at left hand face of saddle block. The device has been found of great convenience for roundhouse work in grinding taper pins and holes, piston rings, joint rings, etc. It is in operation at the Grand Trunk Pacific shop, at Wainwright, Sask., and we are indebted to W. W. Yeager, formerly Locomotive Foreman there and now at Biggar, Sask., for the above data.

process of welding we effect a great saving in time and material. A breakdown occurred in our pumping station a short time ago which was very serious. Two of the water cylinders were broken, and it would have taken considerable time to make patterns and have castings made from them and machined. Instead, the broken cylinders were welded by acetylene, and were in working order again in three or four days, which was a saving of at least ten days against having new castings made and machined.

A great saving is also effected by welding lugs on air pumps which have been broken off; also by welding split pipes. An equally great saving is effected in our superheater work, welding headers and welding in side sheets, cracks in fire boxes, side fire boxes where worn by driving wheel rubbing same, and welding broken cylinders on locomotives.

Two locomotives which were just out of the shop had their cylinders badly broken. These, of course, could be patched, but by welding they were made as good as new. They were repaired by acetylene welding in a shorter time, and a

Steam Railway Statistics for Year Ended June 30, 1915

The table given in our June issue showed the financial results of the operations of steam railways for the year ended June 30, 1915. The following table gives the percentages and the principal statistical information compiled by the companies. The table published in June and the one given below contain all the information given prior to 1910 in our compilation of these statistics, but the columns have been rearranged so as to combine in the first table the financial and in the second the statistical information:

Name of Railway	Ratio of Operating Expenses to Operating Revenue	Proportion of total Passenger service train revenue to total earnings	Proportion of freight plus switching revenue to total earnings	Revenue Train Mileage	Mileage of Non Revenue Trains	Earnings per Train Mile	Passengers Carried	Passengers Carried One Mile	Passenger Earnings per Train Mile	Tons of Freight Carried	Tons of Freight Carried One Mile	Freight Earnings per Train Mile
Algoma Central & Hudson Bay	79.47	10.64	74.57	329,087	39,442	\$ —	38,977	2,004,993	\$ —	612,907	53,950,431	\$ —
Algoma Eastern	61.42	15.63	73.46	111,783	1,723	2.55	53,278	1,412,588	.77	733,397	11,386,065	3.77
Atlantic, Quebec & Western	146.62	44.99	55.01	99,829	8,983	.77	39,071	1,338,088	.58	60,082	2,411,143	.86
Bedlington and Nelson	1474.35	88.58	11.42	672	48	.04	109	745	.03	4	25	.50
Brandon, Sask. & Hudson Bay	216.24	53.21	46.65	65,083	379	.75	24,716	832,268	.60	38,775	1,741,128	.86
British Yukon	32.08	18.79	80.94	46,495	448	6.27	8,287	511,665	1.41	33,593	2,951,708	5.23
Canada & Gulf Terminal	89.00	48.25	51.12	22,894	216	1.82	25,887	521,161	.88	22,542	668,969	.94
Canada Southern	61.78	32.78	66.17	3,580,173	25,169	2.71	1,313,638	108,521,682	1.57	6,732,879	1,024,395,449	3.67
Canadian Government Ry												
Intercolonial	100.79	35.04	63.86	7,344,453	147,823	1.50	3,626,897	167,936,915	1.24	4,442,510	1,157,448,089	1.57
Prince Edward Island	144.73	51.54	45.17	382,315	17,194	1.07	404,598	9,780,362	.57	122,257	4,718,286	.83
Canadian Northern	72.72	23.65	72.59	12,156,671	424,269	1.63	4,080,668	230,580,776	.88	10,536,769	2,150,365,193	2.00
Canadian Pacific	66.29	31.62	66.37	36,835,905	773,240	2.46	13,086,064	1,155,371,348	1.44	21,490,596	7,734,433,065	3.47
Cape Breton	200.42	52.09	45.46	19,468	.....	.53	7,860	172,277	.27	5,415	156,443	.24
Caraquet	93.53	33.60	63.32	48,760	.....	1.46	18,793	670,007	.49	42,252	1,478,820	.92
Crows Nest Southern	233.20	14.92	85.04	62,248	4,815	1.19	9,262	257,934	.25	136,741	8,163,054	1.66
Cumberland Ry. & Coal Co.	73.79	17.67	81.85	51,001	.....	1.99	43,592	456,526	.58	352,849	5,264,321	1.63
Dominion Atlantic	78.83	43.59	55.62	566,733	51,446	1.64	407,492	14,596,307	.84	326,628	21,727,462	1.85
Eastern British Columbia	92.06	6.27	91.77	8,184	96	4.06	3,232	33,019	.25	92,023	849,256	2.90
Elgin and Havelock	101.41	34.01	65.99	16,956	.....	.69	9,851	93,585	.23	10,049	.....	.45
Essex Terminal	65.32	.....	92.07	22,500	.....	.....	.....	.....	.....	164,359	821,795	.....
Esquimalt and Nanaimo	65.47	42.89	53.41	246,783	13,428	2.19	306,563	6,839,181	1.57	291,822	10,209,144	2.91
Fredricton & Grand Lake												
Coal & Railway Co.	109.35	12.00	86.37	34,376	.....	1.45	11,804	263,586	.21	96,568	2,998,710	1.56
Grand Trunk	75.80	33.46	65.13	18,979,452	.....	1.92	11,472,005	571,131,995	1.35	18,496,023	3,401,015,166	2.20
Grand Trunk Pacific	110.86	23.72	74.31	3,125,151	.....	2.13	641,479	51,449,211	1.20	1,454,061	683,064,081	2.51
Hereford	115.92	22.77	76.78	68,370	758	1.32	27,723	524,026	.31	85,602	1,834,357	1.99
Inverness Ry. & Coal Co.	57.57	10.91	88.46	.....	.....	2.00	38,186	823,086	.54	288,470	15,898,665	1.77
International of N.B.	96.26	40.39	58.83	70,053	5,617	1.46	33,919	1,376,427	.65	52,568	2,290,950	1.02
Kent Northern	100.41	42.98	57.02	16,902	.....	1.19	10,000	145,060	.51	7,250	145,000	.68
Kettle Valley	91.86	19.63	78.90	10,758	.....	1.70	2,944	111,507	.37	33,540	267,170	1.34
Klondike Mines												
London & Port Stanley	104.33	20.94	78.30	92,051	37,249	1.50	105,559	1,803,436	.54	594,704	10,335,761	2.27
Lotbiniere & Megantic	109.68	30.53	69.49	18,780	.....	1.24	13,109	178,821	.38	22,773	317,001	.86
Maine Central, (Princ. Br.)	76.24	63.73	36.27	14,385	153	1.29	90,000	459,046	1.15	228,981	1,168,803	.64
Manitoba Great Northern	434.37	25.46	73.38	38,858	427	.63	8,913	203,131	.18	44,029	1,896,184	.61
Maritime Coal, Ry. & Power	57.88	9.53	90.43	29,666	.....	2.34	19,209	191,561	.22	212,149	2,270,762	2.11
Massawippi Valley	113.51	33.36	65.82	163,398	3,415	1.23	151,251	2,509,837	.63	503,781	14,719,664	1.98
Midland of Manitoba	144.48	53.60	38.97	224,182	132	1.12	76,635	4,762,412	.92	140,296	9,978,410	1.19
Moncton & Buctouche	101.19	38.62	59.36	27,020	.....	1.15	24,002	504,320	.60	21,100	433,168	.90
Montreal & Atlantic	83.61	23.53	74.56	510,853	6,377	1.82	328,399	7,695,366	.72	1,069,553	55,285,411	2.03
Montreal & Province	85.82	37.65	60.31	77,471	445	1.36	97,698	1,925,325	.73	93,129	2,394,415	1.75
Montreal & Vermont Jct.	58.80	57.58	42.25	91,538	482	1.37	195,120	4,073,736	1.15	356,275	8,550,600	1.83
Morrissey, Fernie & Michel	89.20	10.85	89.15	27,097	.....	3.45	123,400	752,740	.37	494,137	3,014,235	2.87
Napierville Jct.	56.49	14.80	85.00	47,438	.....	2.51	25,095	449,882	.....	406,017	11,564,093	3.99
National Transcontinental	127.13	.....	.....	236,057	.....	1.18	33,609	1,589,955	2.38	222,372	22,018,668	1.04
Nelson & Fort Sheppard	200.76	44.22	51.62	56,318	433	.83	19,418	524,204	.55	20,245	768,536	1.29
New Brunswick Coal & Ry. Co.	112.64	30.97	63.26	31,139	.....	1.28	17,938	420,850	.42	39,289	811,588	.86
New Brunswick & P.E.I.	117.10	30.27	69.49	38,054	1,684	1.29	19,807	357,328	.55	65,339	1,520,084	.94
New Westminster South	81.24	27.11	65.81	21,276	16	1.39	11,081	116,179	.37	44,088	416,387	.91
Northern New Brunswick & Seaboard	279.89	.....	.....	2,027	12	..	1,080	1,080	..	1,335	1,335	.....
North Shore	119.88	24.84	75.16	.....	.....	1.24	786	6,288	.06	1,550	12,400	.18
Ottawa and New York	133.78	43.81	55.27	133,222	20,138	1.59	127,634	3,185,802	1.17	318,512	15,191,603	2.16
Pere Marquette in Canada	61.52	7.06	92.18	1,114,721	9,533	2.15	299,374	5,631,843	.65	2,745,460	443,368,764	2.52
Quebec Central	67.42	31.06	67.40	706,668	192,486	1.89	387,620	16,644,012	.84	870,393	67,538,021	1.83
Quebec, Montreal & South	126.01	42.50	56.92	289,870	6,553	1.24	245,315	5,279,102	.72	307,352	12,242,673	1.23
Quebec Oriental	94.60	45.04	54.89	104,015	5,223	1.18	30,360	1,987,750	.86	55,224	4,455,111	1.27
Quebec Ry. Light & Power	91.45	11.37	88.28	27,757	915	2.82	82,194	628,539	1.22	216,588	1,634,317	3.35
Roberval-Saguenay	53.84	6.09	62.13	375,935	.....	.....	21,233	691,103	.....	186,013	3,237,634	.....
Red Mountain	212.75	27.95	69.71	6,480	84	1.72	6,509	57,878	.53	14,690	131,806	.91
Rutland & Noyan	82.31	60.12	39.88	7,597	.....	1.85	117,720	399,071	1.55	174,602	591,901	2.60
Salisbury & Albert	96.62	32.79	59.75	29,960	.....	1.20	14,841	329,937	.39	41,059	756,418	.72
Schomberg & Aurora	126.73	49.29	50.71	22,897	.....	.52	20,616	183,582	.25	8,488	132,820	.26
Stanstead, Shefford and Chambly	112.29	49.39	49.95	82,944	1,521	.94	237,258	1,565,400	.63	415,080	2,075,520	.99
St. Clair Tunnel	37.93	.....	98.44	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Lawrence & Adirondack	75.01	43.94	55.57	251,350	5,287	2.21	633,791	12,977,905	1.42	767,937	27,798,601	3.83
St. Martins	90.39	33.43	66.84	17,340	.....	1.06	9,953	189,766	.34	15,065	231,117	.70
Sydney & Louisburg	74.55	7.24	89.95	260,766	.....	2.76	167,640	2,202,369	1.00	4,468,504	67,202,852	2.70
St. John & Quebec	123.31	29.27	69.32	34,139	1,341	1.13	16,727	452,355	.38	30,332	1,155,866	.78

(Continued on page 313)

Steam Railway Statistics for Year Ended June 30, 1915 (Continued from page 312)

Name of Railway	Ratio of Operating Expenses to Operating Revenue	Proportion of total Passenger service train revenue to total earnings	Proportion of freight plus switching revenue to total earnings	Revenue Train Mileage	Mileage of Non Revenue Trains	Earnings per Train Mile	Passengers Carried	Passengers Carried One Mile	Passenger Earnings per Train Mile	Tons of Freight Carried	Tons of Freight Carried One Mile	Freight Earnings per Train Mile
Temiscouata.....	80.29	27.04	72.07	150,999	6,290	1.46	68,057	1,885,725	.41	152,017	6,502,762	2.02
Timiskaming & Nor. Ont.	95.33	37.24	60.43	814,600	58,456	1.81	502,342	20,534,411	1.13	662,336	86,500,437	2.19
Thousand Islands.....	73.63	35.48	54.74	30,500	.....	1.14	35,983	215,628	.40	28,673	172,038	.62
Toronto, Hamilton & Buffalo	75.02	31.81	67.86	428,617	12,578	2.93	581,539	16,470,669	1.30	1,769,488	64,631,644	6.46
Vancouver, Victoria and Eastern.....	126.31	35.72	59.78	287,399	42,952	1.76	182,541	4,824,409	.81	748,899	20,232,070	2.11
Victoria Terminal Ry. & Ferry Co.....	78.70	58.64	27.73	2,673	.....	1.08	51,990	51,470	.82	14,488	14,343	1.30
Victoria and Sidney.....	141.99	64.14	34.94	41,183	.....	.73	55,264	583,134	.60	16,538	201,385	1.09
Wabash in Canada.....	94.96	18.45	80.97	1,446,728	25,819	1.59	538,622	30,451,483	.61	1,786,738	387,121,605	2.43
York & Carleton.....	67.86	33.32	66.68	8,068	.....	.....	6,940	.....	.....	9,694	.....	.....
.....	.....	.....	.....	93,218,479	1,955,104	.....	41,551,031	2,483,708,745	.....	87,204,838	17661,309,723	.....

Canadian Government Railways' General Manager at Fort William.

F. P. Gutelius, General Manager, and other Canadian Government Railways officers were entertained at luncheon by the Fort William, Ont., Board of Trade, July 6. Mr. Gutelius outlined what the government railways had done, were doing, and what they proposed to do for the country. He gave a description of the foundation laying of this work in the construction of the Intercolonial in the Maritime Provinces and told how private lines had been purchased in that district to perfect the service there and improve the railway situation generally. During the past six or eight months the road has been worked to capacity and there has been an average of 300 car loads one way each day. During the past few weeks there have been 200 cars a day handled from Winnipeg east. Seventy-five of these came from the C.N.R. on account of the high water at Fort Frances and the remainder from the G.T. Pacific lines. By the lease acquired recently of the branch line which links Fort William with Winnipeg, Halifax and Winnipeg, have been connected so that there is a through passenger service, which has been recently installed, which makes 16 hours better time than any competitor. Mr. Gutelius stated that during the past year the earnings of the road have paid all the operating expenses and left a surplus of \$1,000,000.

He then went on: "A suggestion has been made this morning that some terminal company take charge of the shipping at Fort William the same as is done in Montreal where the Harbor Commission has charge of the docks and the tracks. I am in favor of this, as it would enable us to serve many elevators from which we are now barred and would enable us to economize in operating expenses. I expect, however, we will get some relief by obtaining direct connection with the government elevator at Port Arthur or possibly obtaining absolute control of this. If this occurs the elevator capacity which we will then have will be almost sufficient for our needs. The building of the new elevator at Transcona will not seriously diminish the quantity of grain to be handled at the head of the lakes, as it will merely handle new business coming from the opening up of new branches, traffic which never came by this route in the past."

He concluded by remarking that on

looking over conditions at Fort William he was ashamed of the freight accommodation and situation. For many years the G.T.P., which owned the triangle west of the union station, had wanted them to take it over. The proposition did not impress them favorably, as it appeared that the investment would be too great for the amount of business received by it. If, however, Fort William shippers would sign an agreement to give the C.G.R. a fair share of their patronage he was of the opinion that the deal might be put through and the necessary improvements made.

Canadian Northern Ry. \$6,000,000 Loan.

W. A. Read & Co. offered in New York recently a new C.N.R. loan of \$6,000,000 six per cent. secured gold notes, dated June 10, 1916, \$3,000,000 due July 10, 1917, and \$3,000,000 due July 10, 1918, principal and interest payable in U.S. gold in New York. The prices were, for notes due 1917, 100½; for notes due 1918, 100. It is stated that the issue was subscribed in one day. The prospectus was as follows:

"These notes are the direct obligation of the Canadian Northern Ry. Co., specifically secured by pledge with the trustee in New York, of \$9,115,140 par value of Canadian Northern Ry. System underlying 1st mortgage bonds unconditionally guaranteed as to both principal and interest by the Dominion of Canada, the Province of Saskatchewan, or the Province of British Columbia. The collateral pledged with the trustee is as follows: \$3,569,947 Canadian Northern Alberta Ry. Co. 3½% 50-year debenture stock, due April 1, 1962, principal and interest guaranteed by Dominion of Canada. \$1,539,982 Canadian Northern Ontario Ry. Co. 3½% 50-year debenture stock, due May 19, 1961, principal and interest guaranteed by Dominion of Canada. \$1,975,839 Canadian Northern Ry. Co. 4% stock, due Jan. 23, 1939, principal and interest guaranteed by Province of Saskatchewan. \$2,029,372 Canadian Northern Pacific Ry. Co. Branch Lines 4½% debenture stock, due April 2, 1950, principal and interest guaranteed by Province of British Columbia. The pledged collateral shows a substantial equity in value figured on a 6% income basis, which is well below current market prices. The bonds securing these notes are prior in lien to the following outstanding securities: \$61,679,000 4% perpetual con-

solidated debenture stock. \$25,000,000 5% income bonds. \$45,000,000 4% general mortgage bonds, guaranteed by Dominion of Canada. \$15,000,000 cash advances by Dominion of Canada, secured by mortgage for that amount. The Dominion of Canada owns \$40,000,000 of the outstanding \$100,000,000 C.N.R. capital stock."

Express Rates on Fruits from Oregon to Manitoba.

The Interstate Commerce Commission gave judgment at Washington, D.C., recently in the case of C. H. Robinson Co. vs. American Express Co., et al, as follows: Complainant is a corporation engaged in buying and selling fruits and berries, with its principal place of business at Grand Forks, N.D. It alleges that the rate of \$2.50 per 100 lbs. charged by defendants for transportation of fruits and berries in carloads from Hood River, Ore., to Winnipeg, Brandon, and Portage la Prairie, Man., is unreasonable and unjustly discriminatory to the extent that it exceeds the rate of \$2 per 100 lbs. applicable on like traffic to the same destination from White Salmon, Wash. Reparation is asked on 9 shipments that moved from Hood River to Winnipeg or Brandon during June, 1914.

Hood River is on the south bank of the Columbia River, 63 miles east of Portland, Ore.; White Salmon, on the north bank of the Columbia River, directly opposite. Hood River is served exclusively by the American Express Co., which does not reach White Salmon or points in Manitoba, shipments from Hood River to points in Manitoba being carried by the American Express Co. to Spokane, Wash., and by the Northern Express Co., or the Great Northern Express Co. beyond. White Salmon is served by the Northern Express Co., which operates from that point into Manitoba.

Six of the shipments involved moved: American Express from Hood River to Spokane; Northern Express from Spokane to Winnipeg. Two shipments moved: American Express from Hood River to Spokane; Great Northern Express from Spokane to Winnipeg. One shipment moved: American Express from Hood River to Spokane; Great Northern Express to Brandon. Charges collected on the first six shipments were \$2,347.08 on 93,883 lbs., at a carload rate of \$2.50 per 100 lbs., minimum 15,000 lbs.; on the next two shipments, \$816.92 on 32,717 lbs.; on the last shipment \$385 on 15,400 lbs. The

following statement offered by defendants shows the rates in effect on fruits and berries in carloads from Hood River to Winnipeg and Brandon during the period from 1912 to the time of the hearing:

TO WINNIPEG.	
Apr. 22, 1912	\$2.25
Mar. 8, 1914	2.50
July 2, 1914	2.25
Jan. 1, 1915	2.50
TO BRANDON.	
May 22, 1912	\$2.25
Feb. 1, 1914	3.60
May 23, 1914	3.10
June 4, 1914	2.50
July 2, 1914	2.25
Jan. 1, 1915	2.50

The \$3.60 rate to Brandon, effective Feb. 1, 1914, and the \$3.10 rate, effective May 23, 1914, were based on the rates to and from Spokane, but the other rates shown were joint through rates. Prior to June 20, 1914, there were no carload rates on fruits and berries from Hood River to Portage la Prairie. A carload rate of \$2.50 was established on that date, which was reduced to \$2.25 July 2, 1914, but which was restored Jan. 1, 1915. The rate applicable on fruits and berries in carloads from White Salmon to the points of destination involved and other points in Manitoba when the shipments in controversy moved was \$2, which rate was applicable to Winnipeg by way of the Northern Express or by way of the Northern Express to Spokane and the Great Northern Express beyond.

Defendants state that the lower rates applicable from Hood River prior to the establishment of the rate attacked were unreasonably low; that the traffic from Hood River had not been bearing its proportionate share of expense; and that it was necessary, in attempting to recoup the losses sustained by reason of our decision in re Express Rates, Practices, Accounts, and Revenues, 24 I.C.C., 380, relative to less than carload rates, to raise rates not found unreasonable in that case to a reasonable level. The traffic from White Salmon can reach points in Manitoba over a single line, and in practically all instances moves over but one line, whereas like traffic from Hood River to the same points must move over two lines, and entails besides switching and inspection costs at Spokane.

Subsequently to the hearing on April 20, 1915, the rate from Hood River to Brandon was reduced to \$2.25, while the rate from White Salmon for a two line haul was increased to \$2.25. On May 22, 1915, the rate from Hood River to Winnipeg and Portage la Prairie was also reduced to \$2.25 at the same time that the rate from White Salmon for a two line haul was increased to \$2.25. All of these rates are still in effect, as is also the Northern Express Co.'s \$2 rate to Winnipeg and other points in Manitoba. The rates to Chicago from Hood River and White Salmon are the same, whether the

hauls involved are single or multiple line. Complexity of route is also disregarded in the rates from Hood River to numerous other points both in the East and in the West and in the rates from White Salmon to numerous destinations.

We find that the rate assailed was, and for the future will be, unreasonable to the extent that it exceeded a rate of \$2 per 100 lbs.; that the shipments were made as described and paid for at the rate herein found to have been unreasonable; that all of the shipments were made by the Fruit Growers' Association of Hood River, Ore., and that the charges collected on the shipments to Winnipeg were paid by the Bright & Emery Co., the consignee, while the charges on the shipment to Brandon were paid by the Pioneer Fruit Co., the consignee at that point, and that both consignees have assigned their interest in the claims to complainant.

Conference rule 362 provides as follows: "In awarding reparation the commission will recognize an assignment by a consignor to a consignee or by a consignee to a consignor, but will not recognize an assignment to a stranger to the transportation records."

So far as appears, complainant was a stranger to defendants' transportation records relative to the shipments, and therefore is not entitled to any reparation that may be due. An appropriate order will be entered.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed the paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates of orders, immediately following the numbers, are those on which they were drawn.

25079. June 16.—Authorizing C.P.R. to build spur for Baker & Betcherman, Gloucester Tp., Ont.

25080. June 17.—Authorizing C.P.R. to build undercrossing of highway on regular road allowance on east boundary sec. 36-8-4, w.3.m. mileage 19.9, Shaunavon Subdivision, Alta., and amending order 18266, Dec. 9, 1912.

25081. June 17.—Authorizing C.P.R. to build its Gleichen Subdivision across road allowance on east boundary of Sec. 21-22-25, w.4.m. Alta., at mileage 14.75, and amending order 18669, Feb. 12, 1913.

25082. June 17.—Suspending proposed cancellation of rates on copper commodities from Smelter, Grand Forks, and Greenwood, B.C., to points in Eastern Canada, as shown in C.P.R. tariff, C.R.C. no. W2147, effective June 18, and ordering C.P.R. to continue rates as contained in its tariff C.R.C. no. W2056, until further notice.

25083. June 17.—Authorizing City of Toronto to build overhead crossing of C.P.R. Queen's Wharf Branch, east of Strachan Ave.

25084. June 19.—Authorizing C.P.R. to build spur from mileage 28.5 Kootenay Central Subdivision, B.C., northeasterly into Lot 129, 770 ft.

25085. June 19.—Authorizing C.P.R. to build spur connecting its Lac du Bonnet and Bergen Northeast branches in Lots 56 to 58, Kildonan Parish, Man.

25086. June 20.—Amending order no. 25015, May 29, 1916, re Canadian Northern Ry. road diversion between Secs. 22 and 23-9-21, w.p.m.

25087 to 25089. June 19.—Approving agreements between Bell Telephone Co. and three telephone companies.

25090. June 19.—Approving bylaw 11 of the Brandon, Saskatchewan and Hudson Bay Ry.

25091. June 21.—Relieving Toronto, Hamilton & Buffalo Ry. from maintaining watchman at crossing of Ancaster Road, Ancaster Tp., Ont.

25092. June 20.—Approving Canadian Northern Ry. plan 291-0, Montreal, March 1, showing station building to be erected at Charlesbourg West, Que.

25093. June 21.—Ordering C.P.R. to lower culvert at public road at east side of track 18 ins., clean out borrow ditch, and repair farm crossing through Lot 5, Con. 3, Ops Tp., Ont.

25094. June 21.—Approving Nelson & Fort Sheppard Ry. bylaw 16, May 16.

25095. June 23.—Authorizing Esquimalt & Nanaimo Ry. to rebuild subway at mileage 6.

25096. June 22.—Authorizing C.P.R. to build spur at mileage 4.8 Smiths Falls Subdivision, Ont., for W. Fraser, Dorval, Que.

25097. June 20.—Approving plan, etc., of Cahill drain, to be built under Michigan Central

and Pere Marquette Rds., in Aldborough Tp., Ont.

25098. June 23.—Approving agreement between Bell Telephone Co. and Mink Rural Telephone Co., June 9.

25099. June 23.—Authorizing Canadian Northern Ry. to rebuild bridge over Vermilion River, at Dauphin, Man.

25100. June 23.—Authorizing C.P.R. to build road diversion in s.w.¼ Sec. 4-18-18, w.2.m., and builds its Pilot Butte ballast pit spur across same at grade.

25101. June 24.—Approving Bedlington & Nelson Ry. bylaws 42 and 43, June 12, and rescinding orders 15437 and 3286, Nov. 22, 1911, and July 16, 1907, respectively.

25102. June 26.—Authorizing Canadian Northern Ontario Ry. to build spur for Lauder, Spears & Howland, at mileage 198.69 from Toronto, in part of Lots 21 and 22, Cons. 5 and 6, Mowat Tp.

25103. June 26.—Authorizing Canadian Northern Ry. to cross and divert highway in s.e.¼ Sec. 29-30-3, w.3.m., Sask.

25104. June 26.—Authorizing Saskatchewan Highway Commissioners to build highway over C.P.R. at Belbeck Siding, on blind line north of Sec. 30-17-26, w.2.m., Sask.

25105. June 26.—Authorizing James Bay & Eastern Ry. to build spur for New York and Dominion Corporation at mileage 3.67 from Roberval, Que.

25106. June 26.—Approving agreement between Bell Telephone Co. and Rosedale Rural Telephone Co., June 15.

25107. June 27.—Authorizing G.T.R. to build siding across Hanna and Atlantic Aves., Toronto.

25108. June 24.—Approving Red Mountain Ry. bylaws 14 and 13, June 12, and rescinding order 3288, July 16, 1907.

25109. June 24.—Ordering Grand Trunk Pacific Ry. to fence certain portions of its right of way between Tete Jaune and Legrand, B.C., by Aug. 31, and rescinding order 24386, Oct. 25, 1915, in so far as it exempts company from fencing its line between mileage 1140.2 and 1142.5.

25110. June 27.—Approving character of work to be done by Minto Tp., Ont., on drain under G.T.R. on Lot 11, Con. 9.

25111. Authorizing Canadian Northern Ontario Ry. to connect with C.P.R. near Chaudiere Jct., Ont., and rescinding order 7490, July 6, 1909, in so far as it refers to connection with Ottawa & Prescott Ry. at mileage 56.6 west of Hawkesbury.

25112. June 30.—Authorizing C.P.R. to open for traffic its line from Simcoe to G.T.R. right of way in Port Dover, Ont., mileage 43.3 to 50.15.

25113. June 30.—Relieving C.P.R. from providing further protection at Thurlow crossing, near mileage 89, Trenton Subdivision, Ont.

25114. June 27.—Authorizing G.T.R. to build additional railway siding and spur for the city's John St. pumping station, Toronto.

25115. June 28.—Approving revised layout of C.P.R. mechanical interlocking plant at crossing at Murdock, Man.

25116. June 28.—Authorizing C.P.R. to build extension to Boake Mfg. Co.'s siding for Harry Webb Co. Ltd., Toronto.

25117. July 3.—Approving location Edmonton, Dunvegan & British Columbia Ry. through Tps. 74 to 71, R. 5 and 6, w. 6 m., Alta., mileage 25.51 to 50.19.

25118, 25119. June 30.—Approving Atlantic, Quebec & Western Ry. bylaw, May 24; and Quebec Oriental Ry. bylaw, May 22.

25120. July 3.—Authorizing Edmonton, Dunvegan & British Columbia Ry. to open for traffic from mileage 287 to 357, Alta., speed of trains limited to 15 miles an hour.

25121. June 28.—Authorizing Canadian Northern Ontario Ry. to build spur for Hawkins Bros., Parry Sound, Ont.

25122. June 30.—Ordering G.T.R. to stop Delaware & Hudson Co.'s train 209 at Stottsville, Girard and Grande Ligne, Que., on Sundays; shipments of milk for Montreal to be picked up and carried by it.

25123. June 30.—Authorizing C.P.R. to build spur for Canada Cycle & Motor Co. in York Tp., Ont.

25124. July 3.—Approving Edmonton, Dunvegan & British Columbia Ry. standard mileage freight tariff, C.R.C. 20.

25125. June 30.—Authorizing Point Grey municipality to extend Oak St. across Vancouver & Lulu Island Ry. and Cedar Lumber Co.'s spur.

25126. July 3.—Ordering G.T.R. for 3 months from July 8, to stop local trains in and out of Montreal at Brussy's crossing, and to keep count and report to Board at end of each month, number of passengers using trains each way.

25127. June 7.—Authorizing C.P.R. to build spurs for Morrison Quarry Co., near Angus shops, Montreal.

25128. June 29.—Authorizing Quebec Government to build public highway over Canadian Northern Ry. on Lot 3, Deschambault Cadastral.

25129. Ordering that Dorchester St., Quebec, Que., be protected by gates, operated by day and night watchman; gates to be installed by Sept. 1, 1912, re special rates for mining students, etc. grade crossing fund, balance and cost of maintenance equally by C.P.R. and Quebec City.

25130. June 29.—Dismissing City of Montreal's application for order modifying profile of Lachine, Jacques Cartier & Maisonneuve Ry. between Hochelaga St. and Cote St. Michel Road, and amending orders 13993 and 15776 to embody modifications asked for.

25131. July 4.—Rescinding order 16056, March 1, 1912, re special rates for mining shipments, etc.

25132. July 4.—Authorizing Harrison, Man., to make highway over C.P.R. at point A in s.e. ¼ Sec. 8-16-20 w.p.m.

25133. July 4.—Approving Yarmouth Tp., Ont., plans and specifications of Copeland Drain under London & Port Stanley Ry.

25134. July 4.—Authorizing G.T.R. to build addition to bridge at Margaret St., Berlin, Ont.

25135. July 4.—Authorizing local improvement district 396, Alta., to make highway over Canadian Northern Ry. between secs 18 and 19-40-18, w. 4. m.

25136. July 7.—Authorizing Canadian Northern Ry. to build spur for Turner Lumber & Pulpwood Co., at mileage 125.93, Chicoutimi Subdivision, Que.

25137. July 7.—Authorizing Edmonton, Dunvegan & British Columbia Ry. to build across certain highways on its Grand Prairie Branch, mileage 25.51 to 50.19, Alberta.

25138. July 7.—Approving proposed connection between new switching lead to be built by Canadian Car & Foundry Co., Ltd., on Montreal Park & Island Ry. property, north of River St. Pierre and G.T.R., at Turcot, Que.

25139. July 8.—Relieving Quebec, Montreal, & Southern Ry. from providing further protection at Grand Caroline crossing, between Rougemont and St. Dumas stations.

25140. July 7.—Ordering Grand Trunk Pacific Ry. to install at Peterson, Sask., a box car body for waiting room and freight shed; and to make small cinder platform; work to be done by Aug. 5.

25141. July 8.—Extending to June 15, 1917, time within which half-interlockers are to be installed at Victoria Ave. and Franklin St., Fort William, Ont., conductors to flag cars over crossings.

25142. July 7.—Approving Montreal Tramways Co.'s plan of additions to interlocking plant at crossing of G.T.R. at Little St. James St., Montreal.

25143. July 7.—Amending item on page 9 of Supplement 5 to Canadian Freight Classification 16, giving specifications for cheese boxes as follows,—paragraph (a): Add at end of paragraph the words, "or four pieces if tongued and grooved."

25144. July 10.—Authorizing C.P.R. to open for traffic its Stirling-Weyburn Line from Foremost to Pokowki, mileage 49.2 to 71.7; speed of train not to exceed 20 miles an hour.

25145. July 7.—Authorizing Toronto, Hamilton & Buffalo Ry. to build spur, with offshoot for Dominion Steel Foundry Co., Hamilton, Ont., and approving clearances.

25146. July 7.—Approving plans and specifications of Logan-Maitland drain, to be built under C.P.R. on Lots 18 and 19, Con. 18, Elma Tp., Ont.

25147. July 11.—Authorizing C.P.R. to build two spurs for Energite Explosives Co., Lot 10, Con. 2, Horton Tp., Ont.

25148. July 12.—Authorizing G.T.R. to build extension to spur for Toronto Harbor Commissioners, in industrial district at dock 1.

25149. July 12.—Authorizing G.T.R. to build two spurs for The Ham & Nott Co., Brantford, Ont.

25150. July 10.—Exempting Esquimalt & Nanaimo Ry. from fencing certain portions of its right-of-way from mileage 2.5 to 31.8, Port Alberni Branch, B.C.

25151. July 12.—Relieving G.T.R. from providing further protection at first public highway crossing just east of Bothwell station, Ont.

25152. July 12.—Authorizing G.T.R. to build extension to spur for Canadian Bag Co., Toronto.

25153. July 13.—Authorizing C.P.R. to build switching track for Wayagamack Pulp & Paper Co., Bellerive Island, Que.

25154. July 13.—Ordering Canadian Northern Ry. to appoint station agent at Dropmore, Man., during Sept., Oct., Nov. and Dec.; if agent is not retained after that C.N.R. to arrange to keep building clean and heated for arrival and departure of passenger trains.

25155. July 13.—Authorizing Canadian Northern Ry. to rebuild bridge at crossing of Ste. Anne River at St. Raymond, Que.

25156. July 13.—Approving agreement between Bell Telephone Co. and Horton & McNab Telephone Association, June 9.

25157. July 14.—Declaring that crossing of highway known as Double Road, or French Road, by G.T.R., west of Vaudreuil station, Que., is protected to Board's satisfaction.

25158. July 13.—Extending 60 days from date time within which C.P.R. shall install bell at crossing two miles south of Brampton, Ont., known as second line west.

25159. July 13.—Authorizing Canadian Northern Ry. to build spur for Vegreville Milling Co. & Imperial Oil Co. Ltd., Vegreville, Alta.

25160. July 14.—Authorizing G.T.R. to build siding for Canada Forge Co., Welland, Ont.

25161 to 25163. July 13.—Approving agreements between Bell Telephone Co. and three telephone companies in Ontario.

25164. July 13.—Authorizing Kettle Valley Ry. to cross Canadian Northern Pacific Ry., pending installation of interlocking plant at Hope, B.C., all trains to be flagged over crossing by flagman appointed by C.N.P.R. at expense of K.V.R.; interlocking plant to be installed by Sept. 1.

25165. July 13.—Approving clearances on C.P.R. spur track 3 to North Pacific Lumber Co. on a trestle built through part of Burrard Inlet at Barnett, B.C.

25166. July 7.—Authorizing G.T.R. to build siding across Redan St., St. Thomas, Ont.

25167. June 25.—Authorizing Canadian Northern Ry. to extend spur across Avenues 106 to 112, north of Portage Ave., Edmonton, Alta., until Nov. 1.

25168. July 13.—Ordering Campbellford Lake Ontario Western Ry. (C.P.R.) to build farm crossing at station 1570, Hinchinbrooke Tp., in accordance with regulations, by Aug. 15.

25169. July 18.—Authorizing Canadian Northern Ontario Ry. to open for traffic its line from junction with Mount Royal Tunnel & Terminal Co.'s tracks, near St. Laurent, Que., to junction with C.N.O.R. near Grenville, Ont.

25170. July 18.—Authorizing Lake Erie & Northern and G.T.R. to operate over crossing at Simcoe, Ont., without first stopping; man in charge of interlocking plant to be appointed and paid by L. E. & N.R.

General order 168. July 11.—Ordering railway companies west of Montreal, subject to Board's jurisdiction, to carry desiccated vegetables in carloads to Montreal for export at domestic rates to Montreal, with addition of terminal charge at Montreal not to exceed 6/10 of 1c per 100 lbs., whenever said combination is less than rate of published export tariff.

Government Directors of Railways.

In accordance with legislation passed at the Dominion Parliament's last session, the Dominion Government has appointed the following directors for the Canadian Northern and Grand Trunk Pacific Railways respectively.

Canadian Northern—W. J. Christie, Winnipeg; W. K. George, Toronto; H. W. Richardson, Kingston.

Grand Trunk Pacific—J. B. Fraser, Ottawa; Jules Hone, Montreal; Peter McAra, Regina.

W. J. Christie is a Winnipeg real estate dealer.

W. K. George, of Toronto, was born at Kingston, Ont., in 1861, the son of the late Rev. Dr. James George, Principal of Queen's University, and was educated at Galt Collegiate Institute and Toronto University. He began business in Manitoba in 1882, and later went to Chicago, where he engaged in manufacturing. He returned to Toronto after seven years, and has been actively engaged in business there ever since. He is President of the Standard Silver Company, President of the Canada Bond Corporation and President of the London and Lake Erie Transportation Co., Vice President of the Sterling Bank and a director in a number of other corporations. He has been President of the Canadian Manufacturers' Association, President of the Canadian National Exhibition Association, and is a governor of Toronto University, Commissioner for Ontario of the Boy Scouts and an esquire of the Order of St. John of Jerusalem.

H. W. Richardson, of Kingston, Ont., is head of the firm of James Richardson & Sons, grain merchants and ship owners, Vice President of the Great Lakes Transportation Co., and is a member of the Montreal, Toronto, Winnipeg, and Calgary Boards of Trade. He has served as an alderman, and as President of the Board of Trade. He was the first President of the Kingston Canadian Club.

J. B. Fraser is an Ottawa lumber merchant.

Jules Hone was born at Montreal, Sept. 8, 1874, and entered C.P.R. service in the Car Accountant's office, Montreal, Mar. 14, 1889, and from July, 1890, to Aug., 1891, was secretary to the Manager of Transportation, Montreal; Aug., 1891, to the summer of 1892, in city ticket office, Montreal; 1892 to July 4, 1893, chief clerk, city ticket office, Montreal; June 21, 1896, to Nov. 1, 1903, ticket agent, Windsor Hotel, Montreal; Nov. 1, 1903, to 1906, city passenger, freight and steamship agent, Quebec, Que.; 1906 to Apr., 1911, City Passenger and Ticket Agent, Quebec.

On leaving the C.P.R. service he opened a steamship and general ticket agency, in partnership with L. J. Rivet, in Montreal, with a branch office in Quebec.

Peter McAra is head of the firm of McAra Bros. & Wallace, financial, insurance and real estate agents, Regina, Sask.

Railway Finance Meetings, Etc.

Central Ry. of Canada.—A meeting of bondholders has been called to be held in London, Aug. 17, to consider the scheme of arrangements between the Central Ry. Co., of Canada and its creditors which was filed by the company in the Exchequer Court of Canada in May, 1916, and to consider what steps should be taken for protecting and enforcing the security for the bonds, and if thought fit to pass all necessary resolutions requesting the trustees for the bondholders to declare the principal of the bonds to be due and to enforce the security for the bonds by the appointment of a receiver or otherwise, and to appoint a committee to represent the bondholders and to confer on such committee all such powers and authorities as may be thought expedient. The meeting is called by the City Safe Deposit and Agency Co., as trustee under the provisions of the trust deed and at the request of the bondholders.

Central Ry. of Canada. It is proposed that bondholders shall hold all interest coupons overdue and those to become due, until Jan. 21, 1921, when they will receive first mortgage bonds for the total amount of the coupons. The creditors will be paid in 6% income bonds, interest being dependent on earnings after meeting interest on the first mortgage bonds. Shareholders will receive no dividends until the holders of the first mortgage bonds have received full payment of their interest for three consecutive years. All cash subsidies received up to Jan. 1, 1921, will be used for construction and equipment of the line, and all subsidies received after that date will go to meet interest on the first mortgage bonds.

Great Northern Ry. and Mining Co.—The Nova Scotia Government has cancelled this company's certificate of registration. The company's property was sold in January, under a judgment to the Banque Nationale's General Manager, who was said to be acting on the bondholders' behalf. The company carried on some mining operations on Cape Breton Island, N.S., and had power among other things to build a railway, but it did not exercise it.

Temiscouata Ry. Net earnings for April, \$3,797, and aggregate net earnings from July 1, 1915, to Apr. 30, \$28,143.

Rogers Pass Tunnel, Canadian Pacific Railway.

We are advised by J. G. Sullivan, M. Can.Soc.C.E., Chief Engineer, Western Lines, C.P.R., Winnipeg, that the progress in connection with the Rogers Pass tunnel from Mar. 30, was 5,547 ft., and the total progress 5 miles, the drilling being completed on July 6.

The Duke of Connaught, Governor General, accompanied by the Duchess and Princess Patricia, were taken through the tunnel, which is rapidly approaching completion, on a special car, July 18. On the car reaching the western portal, the Duke named the tunnel "The Selkirk." The C.P.R. was represented by Grant Hall, Vice President and General Manager, Western Lines, and J. G. Sullivan, Chief Engineer, Western Lines; A. C. Dennis, M. Can.Soc.C.E., Superintendent for the contractors, Foley, Welch & Stewart, represented them.

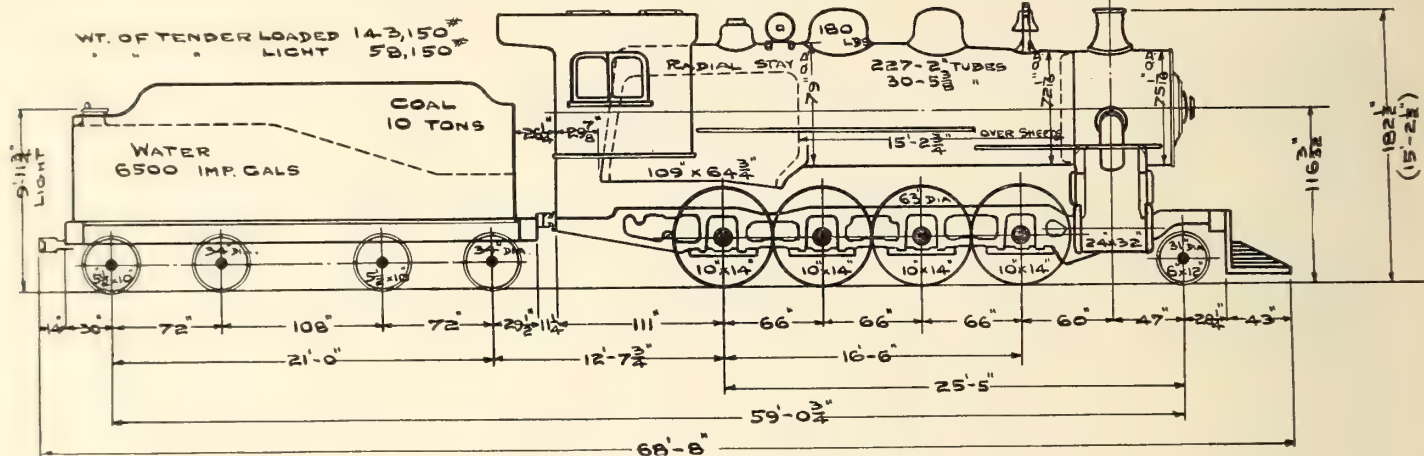
Locomotives for Canadian Government Railway.

The Canadian Government Railways have received recently 15 heavy 2-8-0 class locomotives from Canadian Locomotive Co., Kingston, Ont. No special feature are comprised in them, outside the railways' standard practice. The boiler is of the extended wagon top type, and is 72 in. in diameter at the front end, and 79 in. at the largest course. The barrel is fitted with 2 in. and 5% dia. tubes, 15 1/4 ft. over tube sheets, and has a 30 unit. Locomotive Superheater Co.'s head-

from Canadian Locomotive Co., for delivery in time for handling the autumn crop movement. They will comprise many features which are new to Canadian railways, the specialties including: Tate flexible staybolts, Locomotive Superheater Co.'s latest type of superheater, two 5,000 gallon capacity injectors, four 3 in. safety valves, fire brick arch, vanadium cast steel frames, metallic packing, crossheads of two bar alligator type, Walschaert valve gear, Casey-Cavin power reverse gear, relief valves, Franklin hard grease driving box cellars, Franklin automatic fire door, trailing truck of radial bar type with outside

Combined Railway and Steamship Bill of Lading.

D. H. Ross, Canadian Trade Commissioner at Melbourne, Australia, in reporting to the Trade and Commerce Department at Ottawa recently, said: "Of all the objectionable shipping documents transmitted to Australian importers by Canadian exporters of goods and products, the combined Railway and Steamship Bill of Lading easily takes first place. Prior to the war, the use of such documents was not general, but in recent months it has been the rule rather than



Consolidation Locomotive, Canadian Government Railways.

er. The fire box is 64 1/4 x 109 in., and there are power operating grate shaker, radial buffers between engine and tender, self centering valve stem guides and extended piston rods. The general dimensions, etc., are as follows:

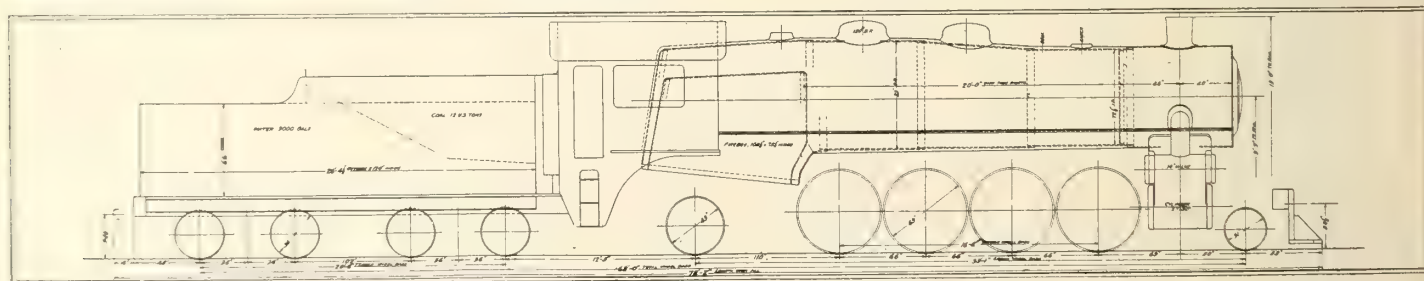
Weight on drivers	203,700 lbs.
Weight in working order, total	231,800 lbs.
Wheel base, rigid	16 ft. 6 ins.
Wheel base, total	25 ft. 5 ins.
Wheel base, engine and tender	69 ft. 11 ins.
Heating surface, firebox	189.51 sq. ft.
Heating surface, tubes	2,436 sq. ft.
Heating surface, total	2,625.5 sq. ft.
Driving wheels, diam.	63 ins.
Driving wheels, material	Cast steel.
Driving journals	10 by 14 ins.
Cylinders, diam. and stroke	24 by 32 ins.

beams, vestibule type of cab, Detroit 5-feed lubricators, incandescent headlight with latest type of turbo-generator, radial buffers between engine and tender, cast steel cradle at rear end of frame, Canadian Locomotive Co.'s injector checks on top of boiler, pedestal type of tender box, Westinghouse special strainer and 8 1/2 in. cross compound air pump. The principal dimensions are as follows:

Weight in working order on drivers	213,500 lbs.
Weight in working order, total	283,000 lbs.
Wheel base of engine, rigid	16 ft. 6 ins.
Wheel base of engine, total	35 ft. 1 in.
Wheel base of engine and tender	68 ft.
Heating surface, firebox	242 sq. ft.
Heating surface, tubes	3,398 sq. ft.

the exception. So grievous is the discontent, amongst importers of made in Canada goods, that representations have been made to the effect that the Canadian Government should be approached with the view of enacting legislation to make it an offence for railways in the Dominion to issue a document so detrimental to the material interests of manufacturers and exporters, as the combined bill of lading."

Enquiry goes to show that the Trade Commissioner has got unduly excited or does not understand the subject. Canadian Railway and Marine World is officially advised that the Trade and Commerce Department has done nothing in



Mikado Locomotive, Canadian Government Railways.

Boiler, type	Extended wagon top, radial stay.
Boiler pressure	180 lbs.
Tubes, no. and diam.	227, 2 ins.; 30, 5% ins.
Tubes, length	15 ft. 2 1/2 ins.
Injectors and safety valve	Locomotive type.
Brakes	Westinghouse American.
Packing	Metallic.
Superheater	Locomotive Superheater Co., Schmidt Type A.
Valve gear	Walschaert.
Weight of tender, loaded	140,000 lbs.
Tank capacity	6,500 Imp. gals.
Tank, type	Water bottom.
Coal capacity	10 tons.
Tender truck	Outside equalized.
Tender wheels	34 ins. diam.
Wheels, type	Cast steel centre, steel tired.
Truck journals	5 1/2 by 10 ins.
Brake beams	Steel I section.

Canadian Government Railways have ordered 30 Mikado (2-8-2) locomotives

Heating surface, total	3,640 sq. ft.
Driving wheels, diam.	63 ins.
Driving wheel centres	Cast steel.
Driving journals, diam. and length	Main 11 by 20 ins.; others, 10 by 20 ins.
Cylinders, diam. and stroke	27 by 30 ins.
Boiler, type	Extended wagon top, radial stay.
Boiler pressure	180 lbs.
Tubes, no. and diam.	240, 2 ins.; 32, 5% ins.
Tubes, length	20 ft.
Grate area	56.5 sq. ft.
Weight of tender loaded	166,000 lbs.
Tank capacity, water	9,000 U.S. gals.
Coal capacity	12 tons.
Tank, type	Water bottom, with vestibule connections.
Truck, type	Pedestal equalizer.
Wheel, outside diam.	34 ins.
Wheel, type	Cast steel centre, retaining ring and steel tires.
Journals, diam. and length	M.C.B., 6 by 11 ins.
Brake beam	High speed, with M.C.B. heads.

the matter except to try and ascertain the facts. The Department has been told by some Canadian manufacturers that they prefer the combined railway and steamship bill of lading. The C.P.R. traffic management states that it is quite immaterial to the railway companies whether through bills of lading or local bills of lading are issued. The through bills are issued on shippers' demand.

The G.T.R. was reported recently to be enquiring for about 50,000 tons of steel rails for 1917 delivery. We are officially advised that the management has not decided on 1917 requirements and that no enquiries are out.

Railway Development, Projected Lines, Surveys, Construction Betterments, Etc.

The Bras d'Or Coal Co. has been incorporated under the Dominion Companies Act to carry on coal mining operations, and to own and operate railways, switches, wharves, docks, etc. The company's authorized capital is \$45,000, and its office is in Montreal. The provisional directors are: H. A. Lovett, K.C.; G. W. Cole, N. Scheach, and P. F. Brown, all of Montreal.

Burrard Inlet Tunnel and Bridge Co.—At a meeting of directors in North Vancouver, July 9, it was reported that everything was being done to keep matters in such a condition that as soon as a favorable opportunity arrived for financing construction, advantage might be taken of it. The annual meeting of the shareholders—who represent various municipalities—will be held Sept. 4. (Feb., pg. 51.)

The directors have sent a letter to all the cities and municipalities which hold stock in the company asking them to ascertain from their solicitors whether it would be legal to rescind a resolution passed by the directors in Feb., 1915, by which a contract for the construction of the Second Narrows bridge was let to C. A. P. Turner and the Western Foundation Co.

Edmonton, Dunvegan & British Columbia Ry.—A press report states that the general contract for the 54 mile extension of the main line from Spirit River to the B.C. Block, Alta., has been let to McPherson & Quigley, Edmonton, who have let subcontracts to W. T. Craig, G. Webster, T. Timothy, F. V. Riley and A. McGregor. The general contractors will do part of the grading themselves. This mileage is expected to be completed this year. (July, pg. 281.)

We are officially advised that a subsidy contract has been entered into between the Railway Department and the Company for the construction of a branch line from near Spirit River to and through the Grande Prairie district, Alta., not to exceed 60 miles. Track laying was completed on this branch Mar. 29, and ballasting and finishing up work is nearly done.

The Grand Trunk Ry. started July 1 relaying sections of the line between Toronto and Hamilton with new 100 lb. steel rails. The gangs are working from the Hamilton end.

We are advised that nothing will be done at present regarding the erection of new coal chutes at London, Ont.

A press report states that the company contemplates carrying out some extensive improvements at its Detroit, Mich., freight terminals. The plans are said to call for the building of an inbound freight house, 60 x 731 ft.; an outward freight house, 38 x 160 ft.; with house tracks and paved team tracks, cost \$328,000; new classification yard in Hamtramck district, \$281,000; second passing track eastward in Milwaukee district, \$85,000; rehabilitating of Avery Ave. team tracks and pavements, paving of Twombly Ave. team tracks, paving of team tracks at Ferry Ave., Farnsworth and Dequindre St., north of Gratiot Ave., \$120,000; constructing grades on line leading to West Detroit west of Woodward Ave., \$116,000. (July, pg. 281.)

Great Northern Ry.—A contract has been let, a press report states, to A. Guthrie & Co., St. Paul, Minn., for the completion of the line between Kingard, B.C., and Sumas Landing. This is an

extension of the company's Abbotsford line, and is being built to secure better connections between sections of the company's lines. (July, pg. 281.)

Intercolonial Ry.—In connection with the new terminal railway under construction at Halifax, N.S., a new traffic bridge has been constructed over the cut where it crosses South St. It is a timber structure, and will remain in use until the permanent concrete structure has been erected. Satisfactory progress is reported to have been made on other parts of this line.

Tenders will be received to Aug. 7 for the construction and erection of a passenger station at Halifax, N.S., as part of the Halifax ocean terminals.

The flour shed at Smythe St., St. John, N.B., was destroyed by fire July 1, the loss being estimated at \$75,000. It is reported that the shed will be rebuilt at an early date. (July, pg. 281.)

Kettle Valley Lines.—The section of the line through to Hope, B.C., where a junction is effected across the Fraser River with the C.P.R. transcontinental line, has been completed, and a through train service was put in operation July 31 by the C.P.R., which has leased the line, extending from Midway to Hope, with a number of branches, one running into Republic, Wash., the others serving Grand Forks and Merrit, by the latter of which connection is made with the C.P.R. at Spence's Bridge. By a joint arrangement with the Vancouver, Victoria & Eastern Ry. (Great Northern), that company's tracks are operated over through Princeton to the Coquihalla summit, and the V. V. & E. Ry. operates over the K. V. Lines' tracks, down the valley to Hope. About the last piece of construction completed on the line was the bridge at Ladner Creek, 20 miles west of the Coquihalla summit, and 38 miles east of Hope. It is about 600 ft. long, and the rail level is 230 ft. above water level. (June, pg. 223.)

Michigan Central Rd.—With reference to press reports as to a probable removal of the company's terminals from Courtright to Sarnia, mentioned in our last issue, we are officially advised that there is no intention to make any such change.

Respecting the bridge work being done at Bear Creek, we are officially advised that the company is taking out an old truss span structure at mileage 1.25 on the Petrolea Branch, and replacing it with steel girders on concrete piers. The work is being done by the company's own forces, and will not cost anything like the \$60,000 which, according to the report, was the estimated cost. (July, pg. 281.)

National Transcontinental Ry.—Tenders are under consideration for the construction of reinforced concrete foundations on wood or concrete piles for a 1,000,000 bushel storage grain elevator, working house and track shed at Transcona, Man. (July, pg. 281.)

Pacific Great Eastern Ry.—A press report states that \$2,000,000 of the British Columbia Government loan of \$6,000,000 to the company, authorized by the act passed last session, have been sold at 91½, and that the money is in hand for construction purposes.

A press report states that construction has been resumed on various portions of the line between Clinton and Fort George. There is about 26 miles of grading to be completed to connect up the already finished sections, the heaviest work being

near the Horse Lake Summit, and there are three large bridges to be built over Deep Creek. The question of labor is bothering the contractors, who require 1,500 men to carry out the work planned for the year, viz., to complete grading and track laying from Clinton to Quesnel, 185 miles. (July, pg. 282.)

The North Vancouver City Council on July 12 decided to renew the lease of the Y at Chesterfield Ave., to the P.G.E. Ry. for 5 years, from Mar. 1915, when the former lease expired. The company's representative stated that it is proposed to establish a car ferry service between North Vancouver and Vancouver, and between North Vancouver and Squamish.

Quebec Bridge.—It is reported that Sept. 26 is the day set for the floating into position of the span to connect the ends of the north and south cantilevers of the bridge across the St. Lawrence River at Quebec. The span is being built on specially constructed scows, which will be floated into position on the rise of the tide, reaching the bridge at high water. The operation of settling the span in position is expected to occupy about an hour. The operation, at any time, is a difficult one, but with a span of the size of the present one, to be put in place where there is such a current as in the St. Lawrence, it is an operation of the utmost delicacy and difficulty. The failure of one man to do his appointed work at the exact time may mean the failure of the job, and its postponement until suitable tidal conditions again prevail. (July, pg. 282.)

A press report, July 18, stated that work was temporarily suspended on this structure owing to the discovery that the cables supporting a part of the structure on the south side had been cut. This has not been confirmed.

A Montreal press dispatch says that the St. Lawrence Bridge Co., a subsidiary company of the Dominion Bridge Co., and of the Canadian Bridge Co., formed for the construction of the Quebec Bridge, is running nearly a year ahead of contract time on the work, which will be concluded this year. In this running ahead of contract, the company is able to save a large amount of money in keeping down overhead expenses. It also means it will be able to redeem the large deposit made to the Government on the work and thus secure a year's interest upon it. Dominion Bridge's share of the profits, it is said, will run between \$2,000,000 and \$2,400,000, as against previous estimates of slightly over \$1,000,000. The working company will be dissolved upon conclusion of the work, which has already extended over the better part of four years.

Quebec & Saguenay Ry.—A press report July 4 quotes Sir Rodolphe Forget as stating that this line will be completed to Murray Bay by November, and that construction would be gone on with at once.

We are officially advised that even if the line were to be transferred to the Government at once it is scarcely possible that it could be completed to Murray Bay by November. The whole matter as to when work will be started, what will be done, and everything else about the line is under consideration. It is impossible to say when the line will be transferred, and nothing can be said about the cost until the matter has been before the Court of Exchequer. (June, pg. 227.)

St. John & Quebec Ry.—Work has been started on the extension from Gagetown to Westfield, N.B., gangs of men being placed at work at Woodman's Point, and at the Westfield end of the Nerepis bridge.

The work on the section for which Poupore Bros. have the contract, was reported July 12 to be well in hand, several gangs being at work between Evandale and Oak Point. The work is reported to be about the heaviest on the extension. Progress is being made in seven large cuts. The firm's plant consists of 1 steam shovel, 2 donkey engines, 62 dump cars, and 85 tons of light railway track. (July pg. 280.)

Toronto, Hamilton & Buffalo Ry.—We are officially advised, in respect to the company's plans for the development at

Port Maitland, the terminus of the branch line from Smithville, the five mile section of which from Dunnville to Port Maitland is under construction, as follows: The ferry slip is located on the east side of the Grand River about 2,500 ft. from the piers, the yard tracks running parallel with what is known as the discharge of the Welland Canal feeder. Abreast the slip dock a turning basin is being dredged out this year. The slip dock is being constructed with two rows of 60 ft. piles, backed with 40 ft. arch webb steel sheet piling. A 50 ft. apron resting on a pile foundation is to be used as a bridge between the shore tracks and the ferry. The work of building the slip dock is being performed by the company's forces and will be completed about Sept. 1. (July, pg. 28.)

Freight and Passenger Traffic Notes.

The Grand Trunk Pacific Ry. has opened a passenger office at Skagway, Alaska.

The G.T.R. city passenger and ticket offices in Buffalo, N.Y., have been moved from 285 Main St., Elliott Square Building, to 5 South Division, Elliott Square Building.

The Board of Railway Commissioners, on July 3, approved standard mileage freight tariff C.R.C. 20 for the Edmonton, Dunvegan & British Columbia Ry., cancelling C.R.C. 1.

The Kent Northern Ry., under orders by the New Brunswick Government, has resumed a regular daily train service on its line from Kent Jct. on the Intercolonial Ry. to Richibucto. For some time the service had been restricted to four trains a week.

The Canadian Government Railways Passenger Department has issued a circular giving details of steamship services in Nova Scotia, New Brunswick, Prince Edward Island, Quebec and Ontario, connecting with its lines, for the current season. Particulars are given of 60 different routes.

The C.P.R. early in July started operating special trains for observation purposes between Banff and Field, on the Rocky and Selkirk Mountains. The trains have open top observation cars and are drawn by oil burning engines. They will be continued during August.

The Grand Trunk Pacific Ry. has opened passenger, freight and telegraph offices in the Grain Exchange Building, Calgary, Alta. H. Merritt, heretofore of Victoria, B.C., is city passenger and ticket agent, and W. Mewing is in charge of the freight business. Heretofore the company's business in Calgary has been attended to by Niblock & Tull.

The Esquimalt & Nanaimo Ry. has decided to grant the request of residents along the line for an additional Sunday train, but has altered the time of the return trip of the one train each way from Nanaimo, from 2.20 to 3.50 p.m., making the arrival at Victoria, 7.35 instead of 6.00 p.m.. This will be in effect until Aug. 13 only, after which the train will run as heretofore.

The G.T.R. is operating an autobus service from Port Hope to Cobourg, Ont., starting from the former place at 2 p.m., after the arrival of the train from the Kawartha Lakes district, and arriving in Cobourg, a distance of seven miles, in time for passengers to take the car ferry across Lake Ontario. The service will be continued daily except Sundays, until Sept. 4, after which it will be continued

to Sept 30 on Mondays, Thursdays, and Saturdays only.

The Grand Trunk Pacific Ry. has placed couriers on its steamships Prince Rupert and Prince George, on their Alaska route. Their special duties are the entertainment of passengers on the trips, the explanation of points of interest, historically and geographically, and the giving of information as to the manners, customs, and folk lore of the Indian population. The couriers accompany parties from the steamships who make trips over the White Pass and Yukon Ry.

The Lake Erie & Northern Ry. is in operation as an electric railway from Galt via Brantford to Port Dover, Ont., there being 10 trains a day each way on week days, and 7 trains each way on Sundays. The Sunday trains run to and from Concession St., Galt, only, instead of to and from Main St., the distance between these two points being a third of a mile. The C.P.R. short line fares from Toronto and points east, apply to Port Dover via Galt and all points on the L. E. & N. R.

The Kettle Valley Ry. was open for through traffic July 31, a train service being run from Nelson, B.C., on the C.P.R. to Vancouver, 511.9 miles. One train a day each way is being run, the mileage being as follows:—Nelson to Midway, C.P.R., 126.6 miles; Midway to Hope, K.V.Ry., 296.3 miles; Hope to Vancouver, C.P.R., 89 miles. A standard sleeping car is run between Nelson and Vancouver, a cafe car between Nelson and Penticton, and a dining car between Hope and Vancouver. Trains are also being run daily, except Sundays, between Brookmere and Merrit, Nicola and Merrit, and Merrit and Spences Bridge, at which point connection is made with the C.P.R. transcontinental line. By the opening of this new route the time occupied in making the trip between Nelson and Vancouver is reduced by 4½ hours.

130-lb. Rails.—The Pennsylvania Rd. has ordered more than 100,000 tons of 130-lb rails. The only difference between the new section and the 125-lb. standard adopted by this road some time ago is in the addition of ½ in. of metal on the top of the head and 1-31 in. in the thickness of the web. This makes a total height of 6½ in., base width of 5½ in., width of head of 3 in., depth of head of 2 in., and web thickness of 11-16 in., as compared with the corresponding figures of 6¼, 6, 2 15-16, 1 27-32 and 21-32 in. for the 130-lb. section of the American Railway Engineering Association.

Enormous Damages Awarded in the Rogers Pass Tunnel Suit.

Judgment was given at Vancouver, June 30, fixing the damages to be paid McIlwee & Sons, Denver, Col., in the action brought against Foley, Welch & Stewart for breach of contract in connection with the boring of the Rogers Pass tunnel on the C.P.R. The matter came before Mr. Justice Morrison, in the Supreme Court, the sole question to be considered being the amount of damages to be assessed in McIlwee's favor. All the other questions were decided in the Imperial Privy Council's decision which was given in full in Canadian Railway & Marine World for July. This decision settled the principles upon which the damage was to be ascertained.

The Judge began to hear evidence June 21. It was principally of a scientific character, and the various points were illustrated with plans and sections, and models of Mount Sir Donald, and of the tunnel, as well as with specimens of rock. The plaintiffs set their damages at about \$800,000, and after the hearing the Judge placed them at \$576,155.98. This figure was given in evidence by S. W. Brunton, a mining engineer of Denver, Col.

Application was made to Justice Morrison in Chambers July 12, on behalf of defendants, Foley, Welch and Stewart, for leave to appeal against the amount of damages awarded McIlwee & Sons. Leave was granted, the appellants to pay \$600,000 into court, as security for damages and costs.

United States Railway Earnings and Expenses.

Net operating income of United States railways for April increased \$102 a mile, or 42.3%, compared with April, 1910. Comparing April, 1916, with the average April of the preceding five years, the increase was 52.5%. Total operating revenues were \$280,987,306, an increase over 1915 of \$50,008,959. Operating expenses were \$189,923,465, an increase of \$24,928,514. Net operating revenue was \$91,063,841, an increase of \$25,080,445. Taxes were \$12,495,265, an increase of \$1,315,922. This left \$78,507,780 net operating income, available for rentals, interest on bonds, appropriations for improvements and new construction, and dividends. Operating revenues per mile averaged \$1,223, an increase of 20.8%; operating expenses per mile averaged \$827, an increase of 14.3%, net operating revenue per mile averaged \$396, an increase of 37% while net operating income per mile was \$342, an increase of 42.3%. Taxes per mile increased 10.9%. Railways operating 229,621 miles of line are covered by this summary, or about 90% of the steam railway mileage in the U.S.

April operating income per mile was 42.3% greater in 1916 than in 1915, 66.1% greater than in 1914, 59.7% greater than in 1913, and 61.2% greater than in 1912.

The ten months of the current fiscal year, compared with the corresponding period of the preceding year, show changes per mile of line as follows: operating revenues increased 15.8%, operating expenses increased 7.1%, net operating revenue increased 36.9%, taxes increased 7.4% and operating income increased 42.4%.

The rails exported from the United Kingdom in March were 3,368 tons against 17,572 in Mar. 1915.

Board to Enquire into Canadian Railway Situation.

A. H. Smith, President New York Central Rd., New York; Sir Henry Drayton, Chief Railway Commissioner for Canada, and Sir Geo. Paish, of London, Eng., have been appointed to enquire into the whole Canadian railway situation, as foreshadowed during the Dominion Parliament's last session. The order in council is as follows:

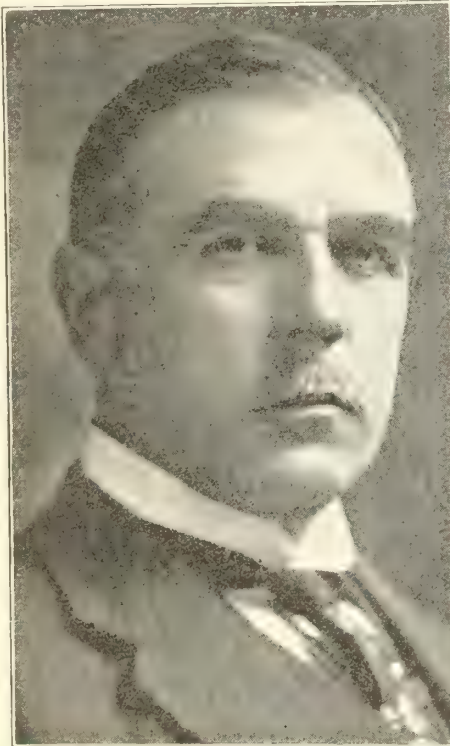
The committee of the Privy Council have had before them a report, dated June 12, 1916, from the Prime Minister, submitting that it became necessary at the recent session of Parliament to make provision for assistance by loan to the Grand Trunk Pacific and Canadian Northern Railway Companies in order that they might be enabled to meet current obligations and to provide for payment of interest on outstanding securities.

Having regard to the conditions and necessities of railway development in Canada the Prime Minister is of opinion that the situation should be considered in a comprehensive way and that a thorough enquiry should be made by a board of the highest ability and experience.

The Prime Minister further submits that the inquiry should have reference to the following matters: 1. The general problem of transportation in Canada. 2. The status of each of the three trans-continental railway systems, the C.P.R., the Grand Trunk Ry. System (including the Grand Trunk Pacific Ry. and the Grand Trunk Ry. and their several branches) and the Canadian Northern Ry. having special reference to the following considerations: (a) The territories served by each system and the service which it is capable of performing in the general scheme of transportation; (b) Physical conditions, equipment and capacity for handling business; (c) Methods of operation; (d) Branch lines, feeders and connections in Canada; (e) Connections in the United States; (f) Steamship connections on both oceans; (g) Capitalization, fixed charges and net earnings having regard to (i) present conditions, and (ii) probable future development with increase of population. 3. The reorganization of any of the said railway systems, or the acquisition thereof by the state; and in the latter case the most effective system of operation whether in connection with the Intercolonial Ry. or otherwise. 4. Generally speaking all matters which the members of the Board may consider pertinent or relevant to the general scope of the inquiry.

The Prime Minister therefore recommends as follows: That A. H. Smith, of New York, N.Y.; Sir Henry L. Drayton, of Ottawa; and Sir George Paish, of London, Eng., be the members of the said Board; A. H. Smith to be Chairman. That the Board be constituted under part 1 of the Inquiries Act, and that it shall have all powers and authorities which could be conferred under the authority of that Act as amended by chap. 28 of the Statutes of 1912, an Act to amend the Inquiries Act. That the provincial governments be respectfully requested to afford to the Board any necessary information and co-operation in the enquiry. That all the departments of the Government shall afford to the Board and to all persons acting under its authority and by its direction all such assistance and co-operation in the inquiry as the Board may desire; That the Board of Railway Commissioners for Canada, the Commission of Conservation, and all other bodies of a

like character under the jurisdiction of the Parliament of Canada, shall co-operate with and assist the Board in the proposed inquiry; That the Board shall report its findings and conclusions with the least possible delay; That a commission



A. H. Smith.
President New York Central Railroad.



Sir Henry L. Drayton.
Chief Railway Commissioner for Canada.

for the purposes aforesaid shall issue to the members of the Board above designated.

The committee concur in the foregoing and submit the same for approval.

Alfred H. Smith, who is 51 years of age, began his railroad career, in 1879,

as a messenger boy for the Lake Shore & Michigan Southern Ry., at Cleveland, Ohio, worked in the Purchasing Agent's office for a time; then resigned to go in a construction gang engaged in the change of grade and reconstruction of the Lake Shore west of Toledo; worked several years there, becoming foreman and general foreman on construction work. In 1890 he was made Superintendent, Kalamazoo Division, and successively was made Superintendent of the Lansing, Franklin and Michigan Divisions. In 1901 he was appointed Assistant General Superintendent of the Lake Shore, and then General Superintendent; and was transferred in 1902 to the New York Central as General Superintendent. In 1903 he was appointed General Manager of that line, and in 1906 was made Vice President & General Manager. On April 15, 1912, he was made Vice President of the lines west of Buffalo, with jurisdiction over operation, maintenance, and construction of all lines in the New York Central system, east and west of Buffalo. On April 1, 1913, he was appointed Senior Vice President with jurisdiction over all the roads included in the New York Central System Lines, and over all departments. He was elected President of all the New York Central Lines Jan. 1, 1914.

Sir Henry Lumley Drayton was born at Kingston, Ont., Apr. 27, 1869, and educated in England and Canada, commencing his legal career in 1886 as a law student at Toronto. He was admitted to the Ontario bar in 1891 and commenced practice in Toronto, being appointed Assistant City Solicitor in 1895, resigning in Sept. 1900 to re-engage in private practice. On Jan. 29, 1904, he was appointed Crown Attorney for the County of York, Ont., resigning in Nov. 1909 to resume private practice. He was appointed a K.C., Jan. 20, 1908, and on Apr. 25, 1910, was appointed Counsel for the City of Toronto, and subsequently was one of Toronto's representatives on the Ontario Hydro Electric Power Commission. In July, 1912, he was appointed Chief Railway Commissioner, following the death of J. P. Mabee. On the outbreak of war he was in London, Eng., and under the acting High Commissioner rendered good service in connection with the aiding of Canadians who were stranded at various points on the continent on account of the war. He was created a knight bachelor on the King's birthday, June 3, 1915.

Sir George Paish was born in England in 1867, and was from 1881 to 1900, successively, secretary to the editor, sub-editor, and assistant editor of The Statist, London, Eng., and since 1900 joint editor. From 1906 to 1908 he was governor of the London School of Economics, member of the departmental committee of the Board of Trade on Railway Accounts and Statistics; 1914 to 1915, adviser to the Chancellor of the Exchequer and the British Treasury on financial and economic questions. Among the works of which he is the author, are, The British Railway Position, Railways of Great Britain, Railroads of the United States, Capital Investments in other Lands, and Savings and Social Welfare. He was created a knight bachelor in 1912.

An Ottawa press dispatch says that the board will probably begin work at once, that the enquiry will be conducted from a central office which will most likely be located at Ottawa, and that the board will travel over the main and larger branch lines. An expert clerical staff

will be employed and steps will be taken to secure full information as to the physical value and financial condition of the roads. It is hoped to have the report ready for the next session of Parliament.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	\$1,206,100	\$921,000	\$285,100	x\$145,400
Aug.	1,192,800	954,000	238,800	x5,900
Sept.	2,014,500	1,358,000	661,600	1,900
	\$4,413,600	\$3,227,000	\$1,186,600	x\$79,300
Decr.	\$658,300	\$579,000	\$79,300	.....
	x Decrease.			

Mileage in operation at Sept. 30, 1915, 4,965, against 4,670 at Sept. 30, 1914.

Commencing with October, the figures show the earnings of the entire system, both eastern and western lines.

	Gross Earnings	Expenses	Net Earnings	Increase
Oct.	\$3,678,500	\$2,421,500	\$1,257,000	\$537,800
Nov.	3,535,200	2,323,800	1,211,400	618,400
Dec.	3,435,600	2,233,500	1,202,100	768,900
Jan.	2,086,800	1,831,400	255,400	88,100
Feb.	2,089,200	1,959,800	129,400	x193,500
Mar.	2,607,000	2,240,600	366,400	x134,800
Apr.	2,824,300	2,274,400	549,900	5,500
May	3,088,900	2,361,700	727,200	368,600
	\$30,047,800	\$22,495,000	\$7,552,800	\$2,216,300
Inc.	\$7,273,700	\$5,057,400	\$2,216,300	.....
	x Decrease.			

Average mileage operated for period ended May 31, 7,935, against 7,001 for same period in the previous year.

Approximate earnings for June, \$3,377,200 against \$1,779,600 for June, 1915, and for two weeks ended July 14, \$1,760,000, against \$879,100 for same period 1915.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1914-15, from July 1, 1915:

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$7,895,375.47	\$5,094,972.35	\$2,800,403.12	\$978,042.71
Aug.	8,801,451.52	5,359,136.80	3,442,314.72	79,157.02
Sept.	10,273,165.45	5,527,864.81	4,745,300.64	378,252.25
Oct.	13,433,206.88	6,863,780.29	6,579,424.15	3,258,105.79
Nov.	13,351,283.51	6,996,870.48	6,354,413.03	3,710,340.86
Dec.	12,705,673.45	7,003,351.97	5,702,321.48	3,502,797.67
Jan.	8,588,826.04	6,498,417.81	2,090,408.23	954,174.93
Feb.	8,795,830.30	6,501,487.56	2,294,342.74	315,328.12
Mar.	10,380,981.98	6,959,651.62	3,421,330.36	448,315.63
Apr.	10,881,306.37	7,147,570.40	3,733,735.97	1,045,980.76
May	12,472,167.46	8,099,884.55	4,372,282.91	1,929,280.72

\$117,589,275.99 \$72,052,988.64 \$45,536,287.35 \$14,639,691.04
Inc. \$26,236,100.14 \$11,596,409.10 \$14,639,691.04

Approximate earnings for June, \$11,343,000, against \$6,990,000 for June, 1915, and for two weeks ended July 14, \$5,354,000, against \$3,301,000 for same period 1915.

Grand Trunk Railway Earnings.

Following are the earnings and expenses for the G.T.R., including the Canada Atlantic Ry., the G.T.W.R. and D.G.H. and M.R., for May, compared with those for May, 1915:—

Grand Trunk Railway.				
	1916.	1915.		
Earnings	\$3,548,400	\$3,234,900		
Expenses	2,465,600	2,183,900		
Net earnings	\$1,082,800	\$1,051,000		
Grand Trunk Western Railway.				
	1916.	1915.		
Earnings	\$ 822,100	\$ 576,400		
Expenses	581,500	570,400		
Net earnings	\$ 240,600	\$ 6,000		
Detroit, Grand Haven and Milwaukee Ry.				
	1916.	1915.		
Earnings	\$ 307,400	\$ 204,000		
Expenses	264,100	239,700		
Net earnings	\$ 43,300	Def. \$35,000		

Approximate net earnings for June, \$5,109,033, against \$4,403,613 for June, 1915, and for two weeks ended July 14, \$2,366,422, against \$1,979,907 for same period 1915.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1 to June 30:—

	1916.	1915.	Increase.
G.T.R.	\$21,061,761	\$18,607,573	\$2,554,188
G.T.W.R.	4,597,519	3,479,230	1,118,289
D.G.H. & M.R.	1,631,250	1,103,806	527,444
Totals	\$27,290,530	\$23,090,609	\$4,199,921

Grand Trunk Pacific Railway Earnings.

Approximate earnings of the Prairie Section, 916 miles, for June, were \$398,405, against \$215,357 for June 1915, and the aggregate earnings for six months ended June 30, were \$2,339,991 against \$1,350,802 for same period 1915.

Railway Rolling Stock Notes.

Imperial Oil Co., Sarnia, Ont., has received 100 tank car underframes from Canadian Car and Foundry Co.

The French Government is reported to have ordered 100 small field locomotives, valued at about \$750,000, from Baldwin Locomotive Works, Philadelphia.

The Canadian Northern Ry. has received 2 compartment observation cars, nos. 9950 and 9951 from Canadian Car and Foundry Co.

The Russian Government, it is stated, is arranging to place orders in Canada and the United States, for 40,000 freight cars.

The Acadia Coal Co. has ordered 150 small all steel mining cars from the Canadian Car and Foundry Co., to be built at its Amherst Works.

Canadian Government Railways have received 200 stock cars, 30 tons capacity, from Canadian Car and Foundry Co. They were described and illustrated in our last issue, pg. 276.

The Canadian Car and Foundry Co. has completed delivery of the 1,200 Belgian box cars, which were ordered by the British Government in June 1915, and which were fully described and illustrated in our issue of September 1915.

It is reported that the Madrid, Alicante & Zaragoza Ry. of Spain has ordered 25 locomotives of the most modern type from the United States. No confirmation of this report has been obtained up to the time of writing.

The Grand Trunk Pacific Ry. has purchased 80 second hand dump cars, nos. 393541 to 393620, from Siems-Carey Co., contractors, St. Paul, Minn., and 43 tank cars, nos. 396900 to 396906, 396920 to 396932 and 396940 to 396962, from the G.T.R.

The Duluth, Winnipeg & Pacific Ry. (C.N.R.) has ordered 750 box cars from Haskell & Barker Car Co., one snow plough from Montreal Locomotive Co., and 10 locomotives from American Locomotive Co.

The C.P.R. is changing the lighting system from gas to electricity, on 141 passenger cars, as follows:—49 sleeping, 12 straight parlor, 15 cafe parlor, 23 dining, 7 compartment sleeping, and 35 observation. In addition to this work, all of which is being carried out at the Angus Shops, the smoking rooms of 11 Glen observation cars are being converted to the same type as those on the Mount observation cars.

Following are the chief details of the 750 box cars which the Duluth, Winnipeg & Pacific Ry. (C.N.R.) has purchased from the Haskell & Barker Car Co., Michigan City, Mich.:—

Capacity	80,000 lbs.
Length over end sills	36 ft. 9 3/4 ins.
Width over side sills	9 ft. 9 3/4 ins.

Length inside	35 ft. 11 ins.
Width inside	8 ft. 6 1/4 ins.
Height inside, clear	8 ft.
Length over pulling faces of couplers	39 ft. 11 1/2 ins.

Following are the chief details of the 10 locomotives which the Duluth, Winnipeg & Pacific Ry. (C.N.R.) has ordered from the American Locomotive Co.:

Weight in working order on front truck	25,000 lbs.
Weight in working order on drivers	216,000 lbs.
Weight in working order, total	241,000 lbs.
Weight of tender, light	61,000 lbs.
Boiler, type	Extended wagon top
Boiler pressure	200 lbs.
Tubes, no. and diam.	227—2 ins., 30—5 3/8 ins.
Tubes, length	15 ft. 2 3/4 ins.
Heating surface, firebox	185 sq. ft.
Heating surface, flues	2,453.12 sq. ft.
Heating surface, total	2,638.12 sq. ft.
Firebox	66 1/4 by 111 ins.
Superheater	C.N.R. Standard
Lighting	Pyle National

Toronto-Port Arthur Summer Passenger Fares Reduced.

For several years the summer all rail first class passenger fares between Toronto and Port Arthur have been, one way \$24.25, and round trip \$39.15. The lake and rail fare, that is, via Port McNicoll, and C.P.R. steamships, or via Sarnia and Northern Navigation Co., have been, one way \$23.25, round trip \$40.45. As the lake and rail fares include meals and berth on steamship, the lake and rail routes had a very substantial differential over the all rail fare and after giving the matter consideration the Canadian Northern Ry. management decided that the lake and rail routes were not entitled to the differential and established summer fares between Toronto and Port Arthur at the following figures: One way \$18.05, round trip \$34.80. The C.P.R. met the all rail fares established by the Canadian Northern and the new rates were put into effect by both lines on June 10 and will continue to Sept. 20.

Government Railways Small Claims Act—The amendment passed by the Dominion Parliament last year is in the following terms:—"The Government Railways Small Claims Act, chap. 26, statutes 1910, and the acts amending the same, chap. 20, statutes of 1913, and chap. 2 statutes of 1914, shall apply and extend to all claims arising out of the operating of all railways, and all branches and extension thereof, and ferries in connection therewith, under the control and management of the Minister of Railways and Canals, as fully as they now apply and extend to claims arising out of the operation of the International Ry." The apparent intention of the 1910 act was to give facilities for their prosecution in the ordinary courts of small claims against the railways operated by the Department of Railways, but it appears that the enacting clause was drawn in such a way that it included the Intercolonial Ry. only. It was first sought to make the provisions of the act apply to the Prince Edward Island Ry. only, in addition to the Intercolonial Ry., but after considerable discussion, the amendment was passed as above quoted.

Traffic Delays in British Columbia.—The C.P.R. and the Canadian Northern Ry. experienced considerable delays to traffic during the last few days of June and the first few days of July owing to washouts—the C.P.R. in the Kicking Horse Canyon, and the C.N.R. on the North Thompson River. The difficulty on the C.P.R. was considerably minimized by its being able to utilize its leased line—the Kettle Valley Ry. Through traffic was resumed on regular schedules in about a week.

Mainly About Railway People Throughout Canada.

Lieut. J. B. Heron, 2nd Field Company, Canadian Engineers, C.E.F., has been appointed a captain in No. 1 Construction Battalion, C.E.F.

Mrs. E. Tiffin, wife of the General Western Agent, Canadian Government Railways, Toronto, who has been ill, has gone to St. Andrews, N.B.

Jos. Ramsey, Jr., President, Lorain, Ashland & Southern Rd., and formerly President, Wabash Rd., died at East Orange, N.J., July 7, aged 66.

Hon. J. D. Reid, Minister of Customs, is again acting as Minister of Railways and Canals, during the absence through ill health of Hon. F. Cochrane.

M. A. Pigott, railway contractor, died suddenly at Hamilton, Ont., July 5, aged 66. One of his last contracts was a section of the Guelph and Goderich Ry., now part of the C.P.R.

R. M. Roy, Manager, Hamilton Bridge Works Co., who died at Hamilton, Ont., June 27, after a long illness, was, for a time, several years ago, in the G.T.R. engineering department.

Hon. Frank Cochrane, Minister of Railways and Canals, left Ottawa, July 12, for St. Andrews-by-the-Sea, N.B., where he is spending the summer, his health being again unsatisfactory.

J. E. McLeod, formerly Superintendent of the Railway Mail Service, Toronto, died there June 9, aged 62. He entered the railway mail service about 40 years ago, and retired in 1913.

Mrs. MacTier and Miss MacTier, wife and daughter of the General Manager, Eastern Lines, C.P.R., left Montreal at the end of June for Murray Bay, Que., where they are spending the summer.

W. C. Hunter, at one time Manager, New Brunswick Coal & Railway Co.'s railway, is now Assistant Superintendent of the Nova Scotia Steel & Coal Co.'s shell shops at New Glasgow, N.S.

Gunner Howard Brown, of the Canadian Field Artillery, son of M. H. Brown, Division Freight Agent, C.P.R., Toronto, who was reported missing, is a prisoner at Dulmen, Westphalia.

Sir Edmund B. Osler, director, C.P.R., and Lt. Col. R. W. Leonard, formerly Chairman National Transcontinental Ry. Commission, have each offered a fellowship in the University of Toronto, tenable for one year.

Lieut. S. H. Hannan, of the Field Artillery, who was killed in action recently, was on the staff of Sir John Jackson, Ltd., Canada, contractors, prior to the war. He was awarded the Military Cross in Sept. 1915.

F. P. Gutelius, M.Can.Soc.C.E., General Manager, Canadian Government Railways, Moncton, N.B., was operated on for appendicitis, at the Western Hospital, Montreal, July 12, and is progressing favorably.

Lt. Col. R. W. Leonard, M.Can.Soc.C.E., St. Catharines, Ont., of the Corps of Guides, and formerly Chairman, National Transcontinental Ry. Commission, has been appointed Assistant Adjutant General on the headquarters staff at London, Ont.

Major Thos. C. Irving, D.S.O., A.M.Can.Soc.C.E., Toronto, of the Canadian Engineers, and Vice President, Robert W. Hunt & Co. Ltd., consulting and inspecting engineers, was married at Hythe, Kent, Eng., July 10, to Miss J. E. Murray, of Toronto.

H. J. Cundall, who died at Charlottetown, P.E.I., July 16, aged 81, acted as land surveyor in connection with land expropriations for the construction of the Prince Edward Island Ry., and was President of the Prince Edward Island Telephone Company.

Sir Donald Mann, Vice President, Canadian Northern Ry., has been on a trip of inspection over the C.N.R. Western Lines, accompanied by E. E. Loomis, Vice President, Delaware, Lackawanna, & Western Ry., and two representatives of New York financial concerns interested in C. N. R. securities.

George Bury, Vice President C.P.R., returned to Montreal at the middle of July after going over the company's lines to the Pacific Coast. A. D. Little, who is organizing a research department for the C.P.R., accompanied him, and address-



F. Rioux,
Assistant to President, Reid Newfoundland Co.

sed a meeting of the Canadian Society of Civil Engineers in Vancouver; and of the Canadian Manufacturers' Association, at Winnipeg.

Albert Moore, private secretary to the General Manager for the Receivers, Pere Marquette Rd., Detroit, Mich., died at his home at St. Thomas, Ont., July 9, of typhoid-pneumonia, aged 23. He was born and educated at St. Thomas, and entered railway service with the G.T.R. and Wabash Rd. there, about six years ago, and transferred to P.M.R. service about three years ago.

Corporal A. M. Morrison, who has been awarded the distinguished conduct medal for conspicuous bravery in action, was, prior to enlistment, one of the engineers engaged on the construction of the Pacific Great Eastern Ry. in British Columbia. One of his brothers is on the Canadian Northern Ry. engineering staff at Toronto, and another is an engineer in the Dominion Department of Public Works at Halifax, N.S.

Edward Fitzgerald, Assistant General Purchasing Agent, C.P.R., who was "loaned" to the British War Office, shortly after the war's outbreak, to purchase in Canada for the Imperial Government, and who since early this year has also been purchasing for the Imperial Munitions Board, has been appointed Assistant to the Chairman, Imperial Munitions Board.

F. W. Peters, General Superintendent, British Columbia Division, C.P.R., Vancouver, has been appointed a member of the Military Hospitals Commission of Canada by the Dominion Government. The Commission's Bulletin says that he has rendered splendid service to returned Vancouver soldiers, and as President of the Vancouver Club has been largely instrumental in the establishment of a returned soldiers' club in Vancouver.

G. G. Ommanney, Special Engineer to the President, C.P.R., who is on leave of absence for military service, was given a commission in the Royal Engineers in August 1915 and is now in command, with the rank of Captain, of the 138th (A.T.) Co., R.E. (B.E.F.) having returned to the front for the second time after a brief leave in England. His work in the C.P.R. service has been absorbed by the company's engineering department.

C. H. Ostler, Engineer and Superintendent, Gas Department, Montreal Light, Heat & Power Co., who died suddenly at Montreal recently, was at one time an engineer on the Kingston & Pembroke Ry., subsequently was an engineer in charge of location surveys for the C.P.R. in Western Canada, and later was in Canadian Northern Ry. service. He was a member of the Canadian Society of Civil Engineers from its inception.

J. Dickson, who was appointed recently Superintendent of Motive Power, Spokane, Portland and Seattle, Oregon Trunk, Pacific and Eastern, Spokane and Inland Empire, Oregon Electric and United Rys., Portland, Ore., was born at Montreal, June 30, 1872, and educated there and at St. Paul, Minn. He entered railway service at St. Paul as a machinist apprentice with the Great Northern Ry., and has chiefly been associated with that road and its subsidiaries ever since.

John Hendry, President, Vancouver, Westminster, and Yukon Ry. Co., died at Victoria, B.C., July 18. He was born at Belledune, N.B., Jan. 20, 1843, and went west in 1872, when he identified himself with lumber and milling interests in British Columbia. He was at different times interested in the Kaslo & Slocan Ry., Nicola Valley Coal & Coke Ry. Co., and the Vancouver, Westminster & Yukon Ry. The last mentioned company's physical properties were sold to the Great Northern Ry. some years ago.

M. W. Bard, who was appointed Assistant Superintendent, District 1, Eastern Division, C.P.R., Farnham, Que., recently, was born at Walnut, Bureau County, Ill., June 27, 1871, and entered railway service, Jan. 8, 1890, since when he has been, to Aug. 2, 1901, freight brakeman, Chicago, Burlington & Quincy Rd.; Aug. 2, 1901, to Aug. 1, 1913, freight conductor, same road; Aug. 1, 1913 to 1914, passenger conductor, same road; 1914 to Jan. 24, 1916, Trainmaster, Construction Department, same road.

R. D. Waugh, Mayor of Winnipeg, has been appointed Chairman of the Greater Winnipeg Waterways District Commis-

sion, succeeding the late S. H. Reynolds, who was also Treasurer; while according to the board's constitution the Mayor of Winnipeg is Chairman of the Administrative Board. J. H. Ashdown, the other Commissioner, was appointed Treasurer. The salary of Chairman of the Commission is \$5,000, and that of the Treasurer \$1,500. The Commission owns a railway extending from St. Boniface to the Shoal Lake, a tributary of Lake of the Woods.

O. M. Lavoie, who was appointed Chief Dispatcher, District 1, Eastern Division, C.P.R., Farnham, Que., recently, was born at St. Cyrille de Wendover, Que., Oct. 16, 1882, and entered railway service Mar. 1899, since when he has been, to Apr. 1900, telegraph operator, Intercolonial Ry.; Apr. 1900 to Sept. 1902, telegraph operator, Quebec, Montreal & Southern Ry.; Sept. 28, 1902, to July, 1909, operator, C.P.R.; July 19, 1909, to Jan. 15, 1916, dispatcher, C.P.R., Farnham, Que.

F. Rioux, Assistant to President, Reid Newfoundland Co., whose portrait is published in this issue, has received a commission as Second Lieutenant in the British Army Service Corps, and has left St. John's attached to a Newfoundland contingent, and will be transferred to the British service on arrival in England. He was born at Trois Pistoles, Que., Apr. 18, 1867, and entered railway service July, 1883, since when he has been, to 1885, operator on construction, C.P.R., Mattawa, Ont.; 1885 to 1888, in operating department; 1888 to 1889, dispatcher, North Bay, Ont.; 1889 to 1898, Assistant Chief Operator, Montreal; 1898 to 1900, Chief Dispatcher, Reid Newfoundland Co., 1900 to 1905, Assistant Superintendent; 1905 to Dec. 31, 1912, Superintendent; Jan. 1, 1913 to date, Assistant to President.

W. D. Robb, Superintendent Motive Power, G.T.R., and Mrs. Robb, left Montreal early in July for England, to see their son, Jas. Bruce Robb, who was wounded in action as mentioned in our last issue. He is a private, no. McG. 81, in the Princess Patricia's Canadian Light Infantry, having gone over with the first reinforcement sent by McGill University, and was in the trenches for nearly a year before being wounded. In a letter received in Montreal at the end of June he said that his back resembled a pepper shaker. He was blown clean out of the trench, and his chum, who was very severely wounded at the same time, wrote home that he did not know what had become of Robb, as when they were blown up they lost track of each other. Private Robb is reported progressing satisfactorily.

Reginald William Douglas Harris, whose appointment as Trainmaster, C.P.R., Ignace, Ont., was announced in our last issue, and whose portrait appears in this issue, was born at Victoria, B.C., Dec. 12, 1879. He is the elder son of Dennis R. Harris, M.Can.Soc.C.E., whose wife is the youngest daughter of the late Sir James Douglas, the first Lieutenant Governor of British Columbia, who founded and named the city of Victoria. He was from 1897 to 1904 with the Bank of British North America, in Victoria and Vancouver, and from 1904 to June 1905, was engaged in civil engineering as assistant to F. J. Ritchie, D.L.S., in British Columbia. He entered C.P.R. service in June 1905, since when he has been, to June 1906, wiper, Field, B.C.; June 1906 to June 1911, fireman, Revelstoke, B.C.; June 1911 to Apr. 1914, locomotive man, Revelstoke, B.C.; Apr. 1914 to May 1916, Trainmaster, Wilkie, Sask.

Andrew F. Macallum, who has been appointed city engineer of Ottawa, entered the railway engineering field after graduation from the University of Toronto. He served in the engineering departments of the Canadian Pacific, Grand Trunk, Toronto, Hamilton & Buffalo, and Minneapolis & St. Louis Railways. For three years he studied sewerage and waterworks systems in several Canadian cities. In 1905 he was placed in charge of 80 miles of construction for the National Transcontinental Ry. Two years later he opened a consulting office in Toronto and reported on the continuation of construction of the Alaska Central Ry. now being built by the United States government. He was also consulting and municipal engineer for West and North Toronto on development of water power, electric railway construction and municipal works. He was made city engineer of Hamilton in 1909.

Charles Hood, whose appointment as Local Freight Agent, C.P.R., Saskatoon, Sask., was announced in our last issue,



R. W. D. Harris,
Trainmaster, District 1, Manitoba Division,
Canadian Pacific Railway.

was born at Edinburgh, Scotland, Jan. 20, 1864, and entered C.P.R. service Aug. 15, 1895, since when he has been, to Sept. 6, 1895, section man, North Portal, Sask.; Sept. 7, 1895 to Oct. 20, 1896, assistant agent, Broadview, Sask.; Oct. 21, 1896, to Oct. 3, 1898, day operator, North Portal, Sask.; Oct. 4, 1898, to Oct. 7, 1899, night operator, Moose Jaw, Sask.; Oct. 8, 1899, to July 12, 1902, agent, Swift Current, Sask.; July 21 to Dec. 21, 1902, agent, North Portal, Sask.; Jan. 19 to Oct. 19, 1903, agent, Swift Current, Sask.; Oct. 21, 1903, to Apr. 30, 1905, agent, Maple Creek, Sask.; May 1, 1905, to Apr. 30, 1906, Supervisor of Agencies, Winnipeg; May 1, 1906, to Nov. 30, 1908, Freight Claims Agent, Central Division, Winnipeg; Dec. 1, 1908, to Dec. 28, 1910, General Fuel Agent, Western Lines, Winnipeg; Jan. 2, 1911, to Apr. 2, 1912, Terminal Trainmaster, Calgary, Alta.; Apr. 3, 1912, to Oct. 18, 1913, Trainmaster, Cranbrook, B.C.; Oct. 19, 1913, to Nov. 10, 1915, Trainmaster, Grand Forks, B.C.;

Nov. 11, 1915, to May 22, 1916, Trainmaster, Nelson, B.C.

William Marshall Thompson, who has been appointed Superintendent of Traffic, Eastern Lines, C.P.R. Telegraphs, Montreal, was born at Long Wharton, England, May 2, 1879, and commenced telegraph service Oct. 1, 1895, since when he has been, to Dec. 8, 1895, operator, C.P.R., Ingolf, Ont.; Jan. 1896 to Aug. 1, 1898, in other business in the United States; Aug. 1, 1898, to May 26, 1899, agent and operator, Manitoba and Northwestern Ry., Neepawa and Keyes, Man.; May 27, 1899, to July 31, 1900, operator, C.P.R., Medicine Hat and Calgary, Alta.; Aug. 15, 1900, to Dec. 15, 1902, operator, Great North Western Telegraph Co., Montreal; Dec. 16, 1902, to Mar. 5, 1904, operator and dispatcher, C.P.R., North Bay, Ont.; Mar. 7 to May 15, 1904, commercial operator, C.P.R., Montreal; Oct. 17, 1904, to Oct. 31, 1905, operator in broker's office, Montreal; Oct. 17, 1904, to Oct. 31, 1905, commercial operator, C.P.R., Winnipeg; Nov. 1, 1905, to July 1, 1910, agent, C.P.R. Telegraphs, Brandon, Man.; July 1, 1910, to July 11, 1911, manager, Grain Exchange Branch, same company, Winnipeg; July 12 to Dec. 31, 1911, agent, same company, Saskatoon, Sask.; Jan. 1, 1912, to Aug. 19, 1913, chief operator, same company, Winnipeg; Aug. 20, 1913, to Mar. 12, 1915, agent, same company, Winnipeg; Mar. 14, 1915, to May 31, 1916, chief operator, same company, Montreal.

Alexander D. Porter, who was recently appointed Mechanical Engineer, Dominion Government Railway to Hudson Bay, Winnipeg, was educated at Aberdeen, Scotland, and studied mechanical and electrical engineering and railway car building at the Robert Gordons Technical College there. He entered railway service in 1897 with the Great North of Scotland Ry., remaining there as mechanical apprentice until 1902, gaining experience in the erecting, machine, boiler, blacksmith and car shops; 1902 to 1905, Engineer in Charge, power plant and car electric lighting plant, same company; 1903 to 1905, draughtsman on locomotive shop and roundhouse design, same company; 1905 to 1906, draughtsman on railway and street cars, United Electric Car Co., Preston, England; 1905 to 1907, leading draughtsman on locomotives, Vulcan Locomotive Works, Lancashire, England; 1907 to 1908, material inspector, Construction Department, C.P.R.; 1908 to 1909, erecting shop foreman, Motive Power Department, same company, West Toronto, Ont.; 1909 to 1910, Foreman of Machine Shop and Air Brake Department, same company, West Toronto; 1910 to 1911, Assistant General Foreman of Shops, same company, West Toronto, and also in charge of investigation work into methods, time studies of locomotive repairs of all kinds and classes of machine work; 1910 to 1913, Assistant Mechanical Engineer, National Transcontinental Ry., in charge of installation of all plant equipment, Locomotive Shops, Transcona, Man., covering the supervision and erection of the whole equipment; 1913 to 1915, in charge of equipment of 13 locomotive houses at division points, same road. The work on the N.T.R. was completed in Oct. 1915, and after spending four months in Great Britain, he returned to Canada to take up his present position.

Hudson Bay Railway.—The Railways Department has ordered from the Algoma Steel Corporation 15,000 tons steel rails, A.S.C.E. standard sections, 80 lb., for the H.B.R., for 1917 delivery.

Terminal Facilities for Handling Grain at Fort William and Port Arthur.

The Fort William Board of Trade sent the following communication to the Board of Grain Commissioners recently:—We make application to your Board on the matter of terminal facilities for handling grain at Fort William and Port Arthur, because your Board has been empowered under a recent order in council to investigate the whole matter of the marketing of Canadian grain, and because the handling of grain at the terminal point appears to us to fall within the scope of the order in council. The situation is in outline as follows:

There are three transcontinental railway lines that carry grain to the head of the lakes. Each of them owns and operates its own terminal facilities, which were not built upon any prearranged plan, and a situation has developed that in our opinion and in the opinion of others leads to a very large amount of unnecessary expenditure, both upon the part of the Federal Government and the cities of Fort William and Port Arthur. In illustration of the unnecessary Dominion expenditure we point to the distance of about 12 miles between the Grand Trunk elevator and the elevator now being built by the Saskatchewan Co-operative Co. Over the whole of this distance there is money spent by the Dominion Government in dredging and various harbor facilities, a very large part of which would be unnecessary had there been a proper harbor planned which would have concentrated the terminal facilities for the handling of traffic upon a small area. It is our belief that millions of dollars have been wasted in this way alone. This diffusion over an unnecessarily large area of terminal facilities for handling traffic has involved waste, not only upon the Dominion Government, but also upon the cities of Fort William and Port Arthur. Houses are built for laborers to operate these facilities, streets laid and city utilities constructed over this unnecessarily large area. This involves an undue expenditure on the part of the cities of Fort William and Port Arthur and an unduly high rate of taxation. Further, it has been a potent factor in increasing the cost of living and thus in increasing the cost of labor, so that it involves not only waste but also an unduly high cost of terminal operation.

To handle all the traffic passing through the twin cities, although that traffic is large, a terminal scheme could have been devised, which would have avoided these undue expenditures. So far as the handling of grain is concerned, the policy hitherto has been that persons or companies building elevators at the head of the lakes erected them so that each elevator was connected with only one of the railway lines. At present only the Dominion Government elevator at Port Arthur has direct connection with two railway lines. All the other terminal elevators are restricted each to one railway line. Persons or firms building terminal elevators and owning and operating country elevators on two or three of the transcontinental systems, naturally desire to have their terminal elevators connected with all the railway lines. As intimated, hitherto this has been impossible. We understand that the Saskatchewan Co-operative Elevator Co. has secured connection with the Canadian Pacific and Canadian Northern Railways, but in order to do so has had to select a

site at the extreme end of Port Arthur, thus still further diffusing the terminal facilities and adding still more to the unnecessary expenditure, both Dominion and Municipal.

Yet owners and operators of terminal elevators desire connection with all the railway lines, and such connection having hitherto been impossible, there has resulted the necessity of either paying switching charges upon grain carried by the lines not directly connected with their elevator, or if they desire to avoid such switching charges, making arrangements with elevators on the other lines with which they themselves have no direct connection, arrangements which undoubtedly tend to minimize competition between the dealers of grain. For example, an elevator served by the Canadian Northern Ry. alone might be operated by a company operating country elevators upon the C.P.R. Such company buying grain along the C.P.R. would desire to consign it to their own terminal, but their terminal being situated on the Canadian Northern they could not consign the grain to their own terminal elevator without paying a switching charge at the head of the lakes. To avoid paying such switching charge they would therefore probably enter into a deal with one or more terminal elevators on the C.P.R. to the effect that they would consign their C.P.R. grain to those elevators, and those elevators would consign the same number of cars of grain to them over the Canadian Northern Ry. Such arrangements as this have been and are made and are now in effect, and while they may enable grain firms to avoid switching charges, they do not tend to strengthen or preserve that competition in the handling of grain which is necessary.

This argument would be much stronger if grain were traded upon sample as well as upon grade at the head of the lakes. Indeed, it may be asserted with confidence that one condition of a successful sample market at the head of the lakes would be securing for each terminal elevator direct connection with all the railway lines.

If your Board, under the order in council referred to, will, as it appears to us it is in duty bound to, give those interested an opportunity of presenting their opinions on this matter, the case can be presented in much greater detail and at much greater length. At present it is enough for us to make application, as we hereby do, to your Board to investigate this phase of the marketing of Canadian grain.

The Board met at Fort William, July 17, when representatives of that city and of Port Arthur were heard.

Negro Construction Battalion. The Militia Department has authorized Lt. Col. Daniel Sutherland, who is a graduate of McGill University, and a railway contractor, and whose address is Queen's Hotel, Halifax, N.S., to raise No. 2 Construction Battalion, C.E.F., the men to be recruited from Canadian negroes and to have white officers. The battalion will probably be called upon to do the same work as No. 1 Construction Battalion, that is, digging, road making, or any hasty military entrenchments or fortifications.

Toronto as a Railway Centre.

There was reprinted in the Toronto Globe recently a news item taken from the paper of the same date fifty years ago, to the effect that there had been held a meeting of the provisional directors of the projected Toronto, Grey & Bruce Ry. This project subsequently became an accomplished fact, and it is now, in a greatly improved form and condition, the Owen Sound Division of the C.P.R. Contemporary with it, and promoted by the same group of enterprising citizens, the Toronto & Nipissing Ry. was completed to Cobocok, and, together with the Victoria Ry. from Lindsay to Haliburton, it is now part of the Midland Division of the Grand Trunk. A very few years later the Credit Valley Ry. was similarly projected, to run from Toronto to St. Thomas and from Streetsville Jct. on that line, through Brampton towards Elora. Later it became a branch of the C.P.R., and it has since been extended to Detroit by way of London, and to Goderich by way of Guelph.

This group of lines was the outcome of the statesmanlike foresight, the persistent enthusiasm, and the tireless promotional work of the late George Laidlaw, to whom Toronto of today owes more of her material expansion than she owes to any other one of her citizens. This may easily be shown by reference to the facts of the railway situation as it was at the time when he began his propaganda and as it is at present. In 1866 there were in existence in local relation to Toronto as a centre the following lines: The main line of the Grand Trunk east through Montreal and west to Sarnia; the main line of the Great Western, now the Southern Division of the Grand Trunk, from Niagara Falls to Detroit, with a branch from Hamilton to Toronto; and the Northern, from Toronto to Collingwood, with a short branch from Allandale to Barrie. Toronto is now the radiating point of the following lines, in addition to those mentioned: Two C.P.R. lines eastward to Ottawa and Montreal; a C.P.R. line to Sudbury; a Canadian Northern line to Ottawa, Montreal, and Quebec; a Canadian Northern line northward through the districts of Muskoka and Parry Sound; and C.P.R. lines from Hamilton to Brantford and Buffalo, connecting with Toronto by a running franchise over the Grand Trunk from Hamilton.

This great expansion of the radiation of railways from Toronto was largely due to the impulse given to its development between 1866 and 1875, and to the later impulse due to the construction of the C.P.R. between 1881 and 1885. Few of the present citizens of Toronto know anything by personal recollection of what took place half a century ago, and it may interest those few and inform the younger generation to be afforded this glimpse of what was done by the stalwart pioneers, whose work of faith laid deep and permanent the foundations of the remarkable progress and permanent prosperity of the city.—Toronto Globe.

The Ontario License Board is reported as intending to prohibit the selling of intoxicating liquors on trains after Sept. 16, when the Ontario Temperance Act will go into force.

Foreign Steel Rail Orders. The Russian Government is reported to have placed orders with U. S. companies for 425,000 tons of steel rails, divided among four companies. During 1915, the same government ordered 400,000 tons of steel rails in the U. S.

Minimum Weight on Lumber Loaded on Flat Cars.

The Chief Railway Commissioner, Sir Henry Drayton, gave judgment on an application by Canadian Western Lumber Co., Ltd., recently as follows:—

In support of the application, the applicants submit,—“This is a very peculiar case. The car in question is a 32 ft. flat car, with a marked capacity of 40,000 lb. According to the tariff in question, this car would take a 40,000 lb. minimum, the same as a car 40 ft. long, and a capacity of anywhere up to 100,000 lb., which is of course unreasonable. The required minimum in this case is also the absolute maximum that can be loaded on the car. It is manifestly impossible in loading lumber to estimate exactly what the full load will weigh. Under the loading regulations, we are not permitted to put on the car more than 40,000 lb. If, in our efforts to put on 40,000 lb. we would exceed this figure by any small amount, it would necessitate stopping the car and unloading sufficient to bring the car down to 40,000 lb. weight. In the case of this particular shipment, it would mean that the lumber would be discharged from the car at the Delta, near Everett, Wash., which is nearly 100 miles from our shipping point. We are not presenting this in the usual form of a claim before the Commission, but to get a ruling on the point raised as to whether the minimum weight on a car can also be the maximum capacity of the car, which forces shippers to either weigh the material before loading (which is impossible), or take chances on underloading the car, thereby paying for dead weight; or, on the other hand, unloading the car and paying for labor of discharging part of the load, as well as the loss incidental thereto, as this work is generally done at some distance from the shipping point.”

The shipment in question consisted of fir. The Great Northern Ry. tariff covering the movement of fir and other lighter woods, contains an exception to the ordinary minimum of lumber loading, which amounts to 40,000 lb., by providing that in cars under 36 ft. in length, when loaded to the “full visible capacity” the minimum will be the actual weight but no less than 30,000 lb. The tariff gives the following definition: “The term ‘loaded to full visible capacity’ means that the entire space in the car shall be utilized to the fullest extent, and that no more lumber (or other material) in ordinary lengths can be loaded therein.”

The argument of the company's Assistant Traffic Manager Smitton, dated April 18, proceeds on the assumption that this provision as to the “full visible capacity” applies to the car in question. This car was, however, a flat car. I am at a loss to see how the loading of a flat car can in any way be covered by “visible capacity,” apart from further specifications or exact provision. How high may or should the loading go? Is it to go to such a height above the car level that any further additions would be either dangerous or create operating difficulties? If so, how can any shipper determine such questions? Apart from the consideration of common sense, this tariff itself would seem to exclude from flat cars the provision of “full visible capacity.” The tariff refers to space “in” the car, and loadings “therein.” Neither of these terms are usually, at any rate, applied to open cars, and are in marked contradistinction to the terms of “on” and “upon.” I am of the opinion that the

rule as to “visible capacity” cannot be applied to a car without a roof, unless the tariff itself supplies information as to the floor area to be occupied and the height to which the loading is to be carried.

It may be noted that the C.P.R. lumber tariff in British Columbia recognizes this difference by showing in addition to the exception made in the Great Northern's tariff a minimum of 30,000 lb. for short, open cars. In the absence of any such provision in the tariff in question, and as the rule of “visible capacity” cannot apply, the minimum must be left at 40,000 lb., that being the marked capacity of this flat car, which is a car of 34 ft. in length, as shown by the Equipment Register, where it is also shown as having a marked capacity of 40,000 lb.

The result is unfortunate, as the tariff certainly starts out to make an exception to the ordinary minimum loading, which as a matter of equity, should apply equally to flat cars carrying lumber of the lighter weights as it does to box cars. The tariff also says that when the marked capacity of the car is less than the minimum carload weight, as provided, the marked capacity will in all cases apply as the minimum. Other Great Northern tariffs recognize the difficulty as to “visible capacity” already noted as applied to open cars, as one of them C.R.C. 1129 provides as follows: “Open cars when compactly loaded with lumber, etc., to a height of 13 ft. above the top of the rail and to within 90% of the length or width of the floor space of the car will be considered loaded to the full visible capacity, and may, in such cases, be taken at actual weight.”

The company also contends that the shipper must state in the bill of lading

that the car had been loaded to its full visible capacity. There is no rule in the tariff requiring this declaration in the bill of lading; and, as a matter which is just as much within the knowledge of the railway company as it is within that of the shipper, such a provision in any event would seem unnecessary. The result is that the car in question under the tariff required the minimum loading of 40,000 lb.

On the question as to a minimum loading as great as the marked capacity of the car, in case of the necessity of getting as good loading as is reasonable, it would appear that there is no good reason why cars should not be loaded to capacity. It is, however, impossible to do this accurately for the reasons set out in the complaint; and it would occur to me that such a rule can only be allowed in cases where an overloading to the extent of 10% is safe and allowed by the railway company.

An interim or informal ruling was asked by the applicant. The whole question may be set down for hearing at Vancouver if the parties desire.

Utilization of Material from Old Freight Cars is being practiced systematically by the Baltimore & Ohio Rd., and the mechanical department estimates a salvage of \$20 a car in this way. The lumber is sawed and planed to remove defective portions and to give suitable sizes. It is then distributed for use in repair work and for building small structures, freight platforms, etc. Bolts, nuts, wheels, rods and other metal parts are sorted, trimmed and stored. The results have been so satisfactory that a reclamation plant has been established at Zanesville, Ohio, to which are sent all cars that are to be scrapped or destroyed. Reclamation work of a lighter character is carried on at division repair shops.

The Canadian Pacific Railway's Roll of Honor.

List 10 issued by C. H. Buell, Staff Registrar and Secretary Pension Department, prefaced by the following remarks: Several thousand officers and employees of this company enlisted for active military duty with the Canadian Expeditionary Forces, and the majority of them are now in Europe, bravely battling for Canada and the Empire. As particulars of army reservists are not available, these lists of those who have given up their lives for their country or been wounded are necessarily incomplete, and do not therefore indicate fully the extent to which the Company's officers and employees have participated in the great struggle.

Addison, Herbert	Carpenter	Winnipeg	Wounded
Anderson, John M.	Clerk	Calgary	Wounded
Arkle, Harry	Tariff compiler	Winnipeg	Wounded
Atkinson, Arthur	Cook	Montreal	Wounded
Boushear, Henry	Engineer	Fort William	Wounded
Burritt, Edgar M.	Clerk	North Bay	Killed in action
Chapman, Edward	Machinist	Angus	Killed in action
Diver, John W.	Car repairer	Toronto	Killed in action
Ellis, Thomas G. G.	Record clerk	Montreal	Died of wounds
Foster, James B.	Car repairer	Fort William	Wounded
Gilchrist, Thomas R.	Draughtsman	Ogden Shops	Suffering from shock
Hamilton, Edward	Deliveryman	Winnipeg	Wounded
Haswell, John	Boilermaker's helper	Moose Jaw	Wounded
Hilliard, Samuel J.	Porter	Edmonton	Wounded
Hogg, James	Clerk	Montreal	Killed in action
Hunt, Thomas	Fitter's helper	West Toronto	Suffering from shock
Kinahan, Ernest	Switchman	B. C. Division	Wounded
Kirwan, George I.	Brakeman	MacLeod	Wounded
McCourt, Samuel	Laborer	Strathcona	Killed in action
MacLaurin, Douglas C.	Student fireman	Sortin	Died of wounds
Maslin, Walter	Wood mch. hand	West Toronto	Wounded (2nd time)
Morrison, Harvey	Assistant Agent	Pilot Mound	Wounded
Moss, Albert	Car inspector	Saskatoon	Killed in action
Parkes, Herbert W.	Clerk	Montreal	Wounded
Price, John	Loco. fireman	Montreal	Wounded
Ross, Lorne	Fitter's helper	London	Killed in action
Scammell, Edward J.	Clerk	Bull River	Wounded
Sheen, Wilfred J.	Clerk	Winnipeg	Suffering from shock
Sweetman, L. H.	Assistant agent	Strathcona	Died of wounds

Co-operation, a Means of Solving the Labor Problem.

By D. McCooe, Superintendent of Tracks, Grand Trunk Railway.

The demand for more economical and practical methods for handling maintenance of way work and forces is increasing each year, and, to meet this, the general practice on most railways is to select the track department for the first retrenchment in both men and material. Like everything else, however, there must be a limit, and some roads have already reached the point where no further reductions can be made along these lines without deteriorating from the set standards of efficiency required on their respective lines.

There is no doubt that, with increasing traffic and the demand for still heavier power and faster trains, the track will require more and closer supervision in the future, but this cannot be accomplished by overloading the camel, any more than the locomotive of 20 years ago could handle the train of the present day.

Without proper and competent supervision there can be no real economy obtained. This may mean some increases in the staff and pay rolls, but it would also mean more work and better service. The importance of this cannot be overestimated when it is considered that a roadmaster with 100 to 200 men under his charge may lose more than his whole month's salary through one day's bad management or by not being able properly to cover his territory and visit the different gangs as often as necessary, especially where new work is being done.

The maintenance of way department has come in for considerable criticism in recent years from men who have both technical training and practical experience. This has done much towards bringing about the present standards and the adapting of many new methods and devices, but very, very little has been done to educate or improve the track forces. In fact, it is said they are the least efficient of any large group in the entire railway organization. Supposing this to be true, who is responsible?

Why are the foreigners replacing the native laborers in track work? We are told it is on account of the higher wages being paid by other industries; and, while this may be true in some districts, it does not apply to all, and, therefore, is only one of several reasons. The foreigners get the same pay that the native laborers do, working together in the same gangs. As an extra inducement, free houses are being built, schools established, and teachers hired by some railways to instruct and educate them. However, if the same encouragement and recognition were given to the native laborers might not better results be obtained?

Several discussions have taken place and committees have been appointed with a view of drafting one standard of practical and scientific methods for handling maintenance work and forces that would be applicable to all railways. But the obstacles to this are that it would be necessary to standardize earnings, men, material and efficiency required by each road to suit the climate and other conditions which are entirely different in each case.

The Pennsylvania is said to be the best managed and maintained railroad in America, but how many other railways are there in the country that could finance or that have the business to justify them in adopting the Pennsylvania's standards, which themselves are subjected to changes? Then why trail along behind, sometimes for years, waiting to see what

some other fellow is going to do?

Some of the leading railways have organized their own maintenance of way association and appointed committees of their own men, who are given subjects with which they are most familiar, including standards, efficiency, and economy, as well as the best practical and technical methods of application, which are most suitable to the local conditions on their line. The merit of such organization and the results being obtained speak for themselves. This is not to be construed, as some may take it, to mean that we are to work in the same old rut. The members of these committees are allowed to visit other railways for the purpose of observation and also to attend the engineering and roadmasters' conventions annually. This gives them the opportunity to see and hear what others are doing.

The bonus or premium system has a tendency to cause dissatisfaction and make the men slight their work. As labor is a commodity governed by the demand, and is worthy of its hire, no further compensation should be necessary, under competent supervision, other than fair and just treatment with merited promotion when the opportunity occurs. All men are not equal, and no amount of drilling will ever make them so. Then why set a limit or expect 100% efficiency, or the equivalent thereof, from every man?

Authority to do the dictating, without being held to strict responsibility for the results, accounts for some of the shortcomings that the little fellows are so often blamed for. It is no excuse for a roadmaster or supervisor, whose track is going back on him, to say that the men are no good. They are generally not much better or worse than he makes them, and this same rule should apply on up to the top of the ladder.

There are no secrets in track or maintenance work that require such great science or skill but that any one with ordinary intelligence and common sense may learn from practical experience, but this cannot be picked up in a few months or a year, any more than a student can get a diploma to practice medicine in the same length of time. However, the man with both the technical and practical training has the advantage and can go higher.

There would be no economy in trying to improve the track by taking out a no. 1 tie and replacing it with a cull. Yet this is just what is being done with our forces. The good men are getting out and the culls are taking their places. What is required is more co-operation and less criticism, as no man or department knows it all. Locate the weak spots and remove the cause by placing the responsibility where it belongs. Then economy and efficiency will follow.—Maintenance of Way Bulletin.

The 239th Battalion Railway Construction Corps, has removed its headquarters from the corner of Hastings and Horner Streets, to 175 Cordova St. West, Vancouver. Recruiting is reported to be progressing at a good rate among railway men in British Columbia and Alberta under the charge of Lt. Col. J. W. Stewart.

To protect a Swiss railway from frequent avalanches numerous snow retaining walls have been built on a mountain side at points from which the slides start, to hold the snow until it melts.

Canadian Northern Railway Construction, Betterments, Etc.

Steel Rails.—The company is reported to have been asking quotations for 25,000 tons of steel rails for 1917 delivery. It is also said that the company is enquiring in the United States for 50,000 tons for next year's delivery.

Mount Royal Tunnel and Terminals.—A press report states that work on the tunnel and terminal facilities is being progressed with satisfactory, and that it is expected they will be ready for operation in the autumn.

Montreal-Ottawa-Port Arthur Line.—The section of the line connecting the Mount Royal terminals with the present line at Hawkesbury is rapidly approaching completion, and it is expected it will be ready for operation in the autumn.

Western Lines.—Six stalls are being added to the locomotive house at Port Arthur, Ont., the locomotive house at Fort William is being enlarged to hold 45 locomotives. Additions are also being made to the plant at Rainy River, Ont.; according to a press report.

We are officially advised that the extension of the freight car repair shop, now under construction in the west yard at Winnipeg, covers an area of 97 x 120 ft. The principal materials employed in the building are concrete, brick, structural steel, timber and skylight work. Four parallel tracks, 97 ft. long, will be laid, which will be extensions of the tracks in the existing freight car repair shop. The contract has been let to the Northern Construction Co., and the work is being carried out under the direction of J. Schofield, architect.

We are officially advised that no decision has been reached as to the suggested extension of the Rapid City Branch to Birtle, Man.

The extension of the company's station facilities at Saskatoon, Sask., is being rapidly proceeded with. The addition will provide new quarters for the dining and sleeping car department office staff.

A press report, July 15, states that a contract has been let to Nesbitt & Co., for the erection of a machine shop and stores building at the Edmonton terminals, at an estimated cost of \$65,000.

British Columbia.—Sir Donald Mann, Vice President, accompanied by M. H. MacLeod, General Manager and Chief Engineer, Western Lines, and a party of New York financial men, have completed a trip of inspection over the company's lines in the West. The party was in Vancouver July 10, and while there Sir Donald and Mr. MacLeod were in consultation with the city authorities respecting False Creek terminal matters. Sir Donald is reported to have said the company has \$5,000,000 on hand for the terminal construction, and there is no reason why the plans under the agreement should not be carried out. The company is building a 30-car ferry with passenger accommodation to run between the mainland and Patricia Bay, Vancouver Island. Arrangements will be made with the British Columbia Electric Ry. so that its cars will connect with the ferry service at both ends. The company's own track between Port Kells and New Westminster bridge is being ballasted, and new rails of the same standard as those on the main line will be laid. The company will ultimately have grain elevators at Port Mann and Vancouver. The plant at the Port Mann car shops, Sir Donald added is sufficient for the next five years, but it is proposed to add such a plant as will be able to turn out five cars a day. This is necessary,

as more freight originates there than is coming to the terminal, and this means that empty cars have to be hauled across the continent.

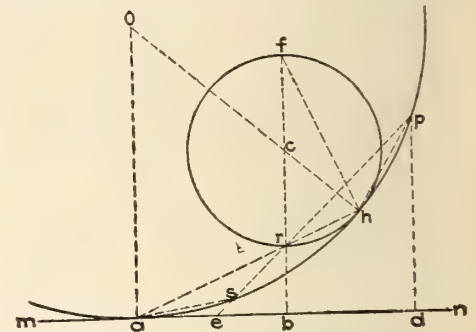
The contract for the erection of the company's station building on the False Creek site has been awarded to Carter, Halls, Aldinger and the Northern Construction Co., Winnipeg, who tendered jointly. A local press report on July 11 said: "Out of five bids received that of the Northern Construction Co. and Carter, Halls, Aldinger, Winnipeg and Vancouver, was the lowest, being \$574,929. Other tenders were Walter Hepburn, \$587,000; McDonald, Nettleton & Bruck, \$592,000; B.C. Construction & Engineering Co., \$620,956; Skene & Christie, \$699,276." Ac-

cording to the agreement with the city council, the company has to expend \$1,000,000 on the station, and on July 12, the city council's railway committee instructed the City Solicitor to write to the company's Toronto office asking how the \$400,000 difference between the contract price and the amount agreed to be spent is to be expended. The company's engineers have been marking out the site of the building and the contractors are getting the preliminary work done.

A suggestion was made to the New Westminster City Council, July 7, that the C.N.R. and the C.P.R. should be asked to build a union station in that city, as a solution of the difficulties in the way of the C.N.R. securing a right of way into the city. (July, pg. 278.)

A Railway Turnout Problem.

A problem that is not uncommon in detail location of railway tracks is treated by C. G. Edwards, Southern Pacific Co., San Francisco, by the following interesting method. The problem was to run in a curve from a given tangent to pass through a given point



Turnout Problem, Geometrical Solution.

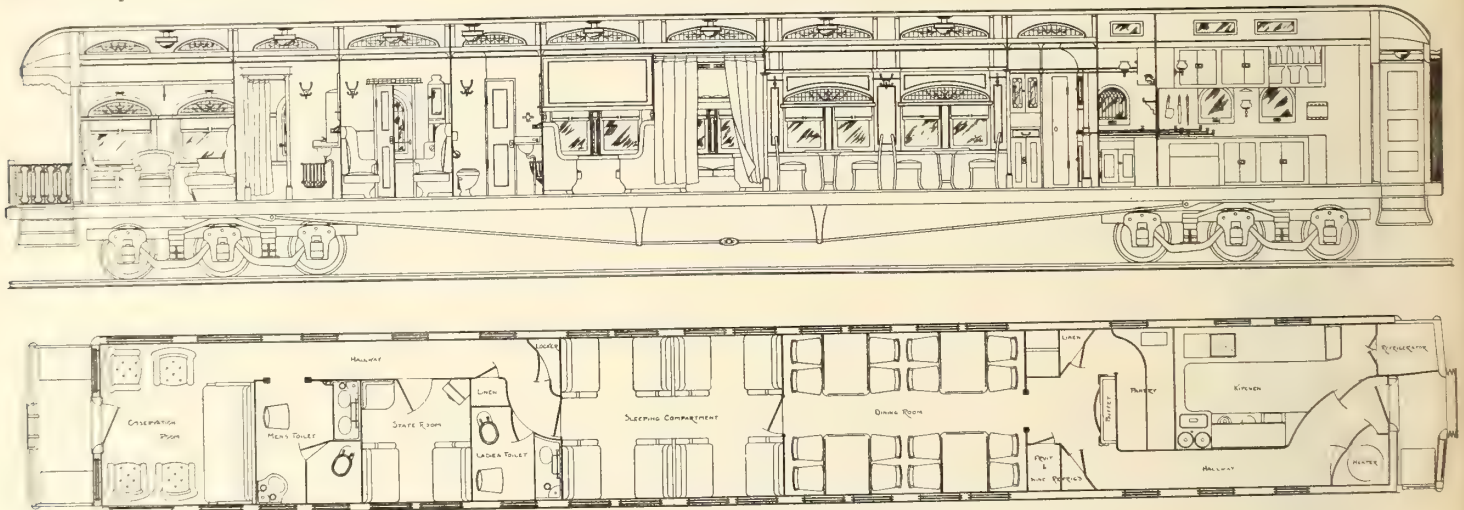
and to pass at a prescribed distance from the corner of a building. The point and the corner of the building are supposed to be tied in to the tangent. In the sketch mn is the given tangent, p the given point and c the corner of the building. A circle rhf is drawn around c with

Combination Sleeping, Dining and Observation Cars, Canadian Northern Railway.

The Canadian Northern Ry. had three sleeping cars of the disappearing berth type built by the American Palace Car Co., which were introduced by that company several years ago, but which apparently failed to meet with success on the various roads on which they were operated. They were so arranged that the

ated that such a car would be capable of handling the sleeping car business under ordinary conditions, and in the event of the increase of the sleeping car business, a standard sleeping car might be added, the combination car affording ample dining accommodation for both cars.

The layout of the three converted cars



Combination Sleeping, Dining and Observation Car, Canadian Northern Railway.

berths were secured on vertical rods, which, on being turned, elevated the berths from storage box recesses under the floor for night use, the berths being lowered into the recesses during the day, so as to be entirely out of the way. As their operation was not attended with any sufficient degree of success to warrant continuing them in service, the three cars were in reality useless in their then form.

The idea was conceived of converting the cars to meet present day practice, by introducing the present type of folding berth. This necessitated the complete remodelling of the cars, and in consequence, it was decided to rebuild them as combination sleeping, dining and observation cars, at a cost of about \$6,000 a car. It was planned that they might be used as guard cafe parlor cars, be leased to a private party of from 10 to 12, be used as private cars to carry executive or official parties over the line, or be used over lines on which the night travel was too light to warrant the use of separate sleeping and dining cars. For the latter purpose, the line from Winnipeg to Prince Albert was considered, as it was estim-

is shown herewith. At one end there is a small observation compartment, back of which, in the order named, are the men's lavatory, a standard state room, women's lavatory, four standard berth sections, dining room with four tables, pantry and kitchen. The four tables in the dining room accommodate 16, but in the event of the car being used for private party work, these tables might be replaced by a central large table accommodating 12. The kitchen and pantry are standard for cafe parlor cars.

The principal expense in converting the cars resulted from the replacement of the substructure, which involved new sills and the removal of the heavy elevating screws and undergear pockets. The interior finish of the cars is cherry in the kitchen, and mahogany in the body. The curtains are of silk faced pantasote, and the trimmings of Persian brass, except in the vestibules, where they are of bronze. They are lighted by acetylene. The overall length is 72½ ft. The body weight is 100,650 lbs., and the truck weight, 36,100 lbs., making a total weight for each car of 136,750 lbs.

the prescribed clearance distance ch as radius. The required turnout is represented by the curve shp with centre at o. Join a and h. This line intersects the small circle at r, which is in the vertical line below c, as can readily be shown by similarity of the triangles chr and oha. Draw other construction lines as shown. The triangles asr and phr are similar, which gives the equation $sr \times rp = rh \times ar$. Also the triangles abr and rhf are similar, which gives the equation $rh \times ra = rb \times rf$, substituting which gives $sr \times rp = rb \times df$. In this equation all quantities except sr can be calculated from the known positions of points c and p with respect to the line mn. Then sr is computed, and from it se and sp can be found. As ae is a mean proportional between se and sp, the beginning of the curve is fixed. It is then a simple matter to find the radius.—Engineering News.

Saskatchewan University's School of Engineering will not re-open this year, the entire faculty and most of the students having volunteered for overseas service.

Canadian Railway AND Marine World

ESTABLISHED 1898

Devoted to Steam and Electric Railway,
Marine, Express, Telegraph, and Railway and Canal
Contractors' Interests.
Official Organ of various Canadian Transportation
Associations.

Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C.E.
Managing Director and Editor-in Chief.
AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editors
JOHN KEIR AND DONALD F. KEIR

Canadian Business Representative,
W. H. HEWITT, 70 Bond Street, Toronto

United States Business Representative,
A. FENTON WALKER, 143 Liberty St., New York

European Business Representative,
J. MEREDITH MCKIM, 16 Regent St., London, Eng.

Authorized by the Postmaster General for Canada,
for transmission as second class matter.

Entered as second class matter, July 25, 1913, at the
Postoffice at Buffalo, N.Y., under the Act of Congress
of March 3, 1879.

SUBSCRIPTION PRICE, including postage any-
where, \$2 a year.

SINGLE COPIES, 20 cents each, including postage.

The best and safest way to remit is by express money
order. Where one cannot be obtained, a post office
money order, or bank draft, payable at par in Toronto,
may be sent. Cheques or drafts not payable at par in
Toronto cannot be accepted. Remittances should be
made payable to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by
the 10th of the month preceding the date of publication.

TORONTO, CANADA, AUGUST, 1916.

PRINCIPAL CONTENTS.

Appointments, Transportation	328
Birthdays of Transportation Men	309
Board of Railway Commissioners—	
Eastern Freight Rates Case	307
Orders by, Summaries of	314
Traffic Orders	329
Board to Enquire into Canadian Railway	
Situation	319
Canadian Government Railways' General	
Manager at Port William	313
Locomotives	316
Canadian Northern Ry. Construction	325
Sleeping, Dining and Observation Cars	326
Canadian Pacific Ry. Construction	331
Co-operation in Labor Problems	325
Electric Railway Department	332 to 340
Canadian Electric Railway Association's	
Annual Meeting	340
Finance, Meetings, Etc.	339
Montreal and Southern Counties Ry. Ex-	
tension	332
Montreal Tramways Co.'s Franchise	339
Ottawa Electric Ry. Employees' Agreement	
Projects, Construction, Etc.	335
Snow Plough Operation	338
Toronto Ry. Rights on Yonge St.	334
Toronto Suburban Ry. Connection at Lamb-	
ton	336
Express Companies, Among the	334
Express Rates on Fruit	347
Freight and Passenger Traffic Notes	313
Grain Handling Facilities at the Head of the	
Lakes	318
Grain Rates, Saskatchewan to Minnesota	323
Grand Trunk Ry. Black Rock Station	331
Lumber Loading of Flat Cars	330
Mainly About Railway People	324
Marine Department	321
Canada's Mercantile Marine, Development	
and Future	341 to 347
Car Ferry Service, Port Maitland, Ont.,	
to Ashtabula, Ohio	342
Great Lakes Transportation Co.'s New	
Vessel	347
Sault Ste. Marie Canals Traffic	343
Vessels Registered	346
Water Pollution on the Great Lakes	343
Pacific Great Eastern Ry. Construction	308
Railway Development	317
Railway Earnings	320
Railway Finance, Meetings, Etc.	315
Railway Mechanical Methods and Devices. 310.	
Railway Rolling Stock Notes	311
Railway Statistics	312
Telegraph, Telephone and Cable Matters	348
Toronto, Hamilton and Buffalo Ry. Report	327

Toronto, Hamilton & Buffalo Railway Annual Report.

The annual report for the calendar year, 1915, shows that the company operates 106.51 miles, of which 4.36 miles is operated under trackage rights, 79.88 miles is main line and 22.27 is branch lines. This is an increase of 14.88 miles, due to the construction of the branch from Smithville to Dunnville, Ont. The report states that the cost of this branch was \$604,954.18 and that preliminary work had been done in connection with the extension of the branch from Dunnville to Port Maitland. "The company," the report says, "has succeeded in acquiring, from the government, the naval reserve lands located at Port Maitland and has purchased additional desirable lands for industrial development along or in the vicinity of the Grand River; the total mileage owned or controlled by the company and available for industrial development at Port Maitland and along the Grand River now approximating 300 acres. Negotiations for the location of manufacturing plants at or in the vicinity of Port Maitland on the land acquired by the company have been under way for some months and there is reasonable probability that during 1916 one or more extensive manufacturing plants will be located. Negotiations are in progress looking to the establishment of one or more car ferries between south shore ports and Port Maitland, and it seems likely that such car ferry service will be installed. Through the location of industrial plants and the establishment of car ferry service a large tonnage of traffic will be obtainable between Port Maitland and Hamilton, and, therefore, it has been decided to push to early completion the construction of the line from Dunnville to Port Maitland and to proceed with the construction of docks and other facilities to enable the company to economically and efficiently handle the contemplated traffic. Assurances have been given by the government that such dredging, in Port Maitland Harbor and in the Grand River, will be done as will ensure a depth of water sufficient for the handling of the largest vessels operating on Lake Erie."

On account of the amalgamation of the Erie and Ontario Ry. (under which charter the Smithville, Dunnville, Port Maitland line is being built), the authorized amount of capital stock was increased from \$5,000,000 to \$5,500,000 and the amount outstanding from \$3,500,000 to \$3,512,500. The funded debt had been reduced by \$150,000 and stood on Dec. 31, 1915, at \$5,405,000. An act of Parliament was assented to April 8, 1915 authorizing the issuance of consolidated mortgage bonds by the amalgamated companies (the T. H. & B. Ry. and the E. & O. Ry., not to exceed \$10,000,000. The directors determined that it would be unwise to issue bonds under the authority of the E. & O. Ry. charter, but decided instead to finance the present and future requirements of the company for capital through the issuance of consolidated mortgage bonds, secured by mortgage on all the company's property. A proposition was made to the owners of the second mortgage bonds, amounting to \$1,000,000, to accept stock of the company at par in exchange for such bonds at par, and arrangements to this end have been practically agreed upon. With this accomplished, it is proposed to reserve sufficient of the consolidated mortgage bonds to protect and provide for the outstanding first mortgage bonds

aggregating \$3,280,000, thus leaving available for sale, as and when the needs of the company shall require, approximately \$6,720,000 in amount of such consolidated mortgage bonds.

Following is a summary of operating results, etc., as compared with the year 1914:—

	1915	1914
Operating revenue	\$1,404,319.55	\$1,335,672.19
Operating expenses	899,636.37	972,110.26
Difference	\$504,683.18	\$363,561.93
Current expenses	12,498.43	8,172.43
Net operating income	\$492,184.75	\$355,389.50
Other income	132,093.92	149,957.15
Gross income	\$624,278.67	\$505,346.65
Deductions	301,466.47	284,054.35
Net income	\$322,812.20	\$221,292.30
Dividends		105,000.00

Transferred to credit of profit and loss

\$322,812.20 \$116,292.30

The profit and loss account, which stood at \$948,920.24 at Dec. 31, 1914, was increased to \$1,295,481.70 at Dec. 31, 1915.

The general balance sheet shows as follows:

LIABILITIES.	
Capital stock	\$3,512,000.00
Funded debt	5,405,000.00
Government and local aid	358,100.00
Working liabilities	1,474,224.26
Current liabilities	1,474,224.26
Deferred credits	23,278.97
Unadjusted credits	57,722.98
Appropriated surplus	421,592.42
	\$12,571,365.11
ASSETS.	
Road	\$7,291,712.41
Investment since 1907	2,809,958.11
Equipment	2,202,041.39
Other investments	359,686.38
Working assets	690,227.99
Deferred debit items	17,438.83
Profit and loss credit	1,275,481.70
	\$12,571,065.11
TRAFFIC STATISTICS.	
Freight train miles	134,492
Passenger train miles	304,967
Special train miles	877
Non revenue train miles	3,236
Total train mileage	443,572
Revenue locomotive mileage	732,415
Non revenue locomotive mileage	7,581
Freight car mileage	4,815,227
Passenger car mileage	1,343,925
Special car mileage	9,567
Non revenue car mileage	74,485
Total revenue freight, tons	1,929,069
Total company freight, current tons.	8,098
Revenue freight current one mile tons.	69,901,665
Company freight current one mile tons	200,480
Freight current one mile per mile of track	656,292
Average distance of haul, miles	36
Average amount received, per ton	\$0.47
Amount received per ton per mile, cents	1.28
Interline passengers carried	347,736
Local passengers carried	164,553
Commutation passengers carried	73,956
No. of revenue passengers carried on lines	16,972,938
No. carried one mile, per mile of road	171,236
Average distance carried, miles	28.95
Average received per passenger	\$0.63
Average per passenger, per mile, cents	2.16
Passenger service train revenue per mile of road	\$1,061.59
Passenger service train revenue per train mile	\$1.32

C.P.R. "Family Gathering." Some 200 C.P.R. officials, from all over the system, representing the operating, mechanical, traffic, and other departments, met in Winnipeg, July 17 to 20 to discuss subjects relating to the various departments' work, the object being to secure even greater efficiency and to stimulate the whole staff. C. E. E. Ussher, Passenger Traffic Manager, Montreal, presided. Those attending were given a welcoming luncheon by A. M. Nanton, of Winnipeg, one of the company's directors, at which the Lieutenant Governor and the Premier of Manitoba and the Mayor of Winnipeg spoke.

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canadian Government Railways.—W. C. ROBERTS has been appointed Auditor of Stores and Mechanical Accounts. Office, Moncton, N.B. (See also National Transcontinental Ry.)

Canadian Northern Ry.—J. HAWKINS has been appointed Road Foreman of Locomotives, Rideau Jct., Ont.

Canadian Pacific Ry.—C. A. LANGEVIN, heretofore Travelling Passenger Agent, Canadian Northern Ry., Montreal, has been appointed City Passenger Agent, C.P.R., Quebec, Que., vice G. J. P. Moore, transferred.

W. F. HEFLIN, heretofore Yardmaster, Sudbury, Ont., has been appointed Inspector of Transportation, Eastern Lines, vice J. W. Wansbrough, whose appointment as Chief Dispatcher, Toronto, was announced in a recent issue. Office, Montreal.

R. G. AMIOT, heretofore chief clerk to First Assistant General Passenger Agent Montreal, has been appointed District Passenger Agent, Montreal.

I. ROTH, heretofore Travelling Passenger Agent, Canadian Pacific Ocean Services Ltd., has been appointed Terminal Passenger Agent, C.P.R., Montreal.

G. J. P. MOORE, heretofore City Passenger Agent, Quebec, Que., has been appointed chief clerk to First Assistant General Passenger Agent, Montreal, vice R. G. Amiot, promoted.

F. C. LYDON, heretofore City Ticket Agent, Montreal, has been appointed City Passenger Agent, Montreal, vice A. E. Lalonde, on leave of absence.

H. W. BOWDEN has been appointed City Ticket Agent, Montreal, vice F. C. Lydon, promoted.

R. JOHNSON has been appointed Excursion Agent, General Passenger Department, Montreal.

M. W. BARD, heretofore Trainmaster Chicago, Burlington & Quincy Rd., has been appointed Assistant Superintendent, District 1, Eastern Division, C.P.R. Office, Farnham, Que.

O. M. LAVOIE, heretofore dispatcher, Farnham, Que., has been appointed Chief Dispatcher, District 1, Eastern Division, Farnham, Que.

W. B. BROWN, heretofore Assistant Superintendent, District 2, Eastern Division, Montreal, has been appointed Chief Dispatcher, Ottawa.

J. A. MCGILL, heretofore Travelling Passenger Agent, Chicago, Ill., has been appointed City Passenger Agent, Ottawa, Ont., vice T. Mullins, whose appointment as City Passenger Agent, Toronto, was announced in our last issue.

T. A. WILSON, heretofore Assistant Superintendent, District 3, Lake Superior Division, Schreiber, Ont., has been appointed Assistant Superintendent, District 5, Eastern Division, vice W. Coulter, on leave of absence. Office, Smiths Falls, Ont.

N. BERGER, heretofore Roadmaster, Schreiber Subdivision, Lake Superior Division, Schreiber, Ont., has been appointed Roadmaster, Smiths Falls, Ont., in charge of construction work in connection with the enlargement of the yard there.

J. W. WANSBOROUGH, heretofore Inspector of Transportation, Eastern Lines, Montreal, has been appointed Chief Dispatcher, District 1, Ontario Division,

Toronto, vice J. E. Ryan, whose appointment as Car Service Agent, Eastern Lines, Montreal, was announced in our last issue.

In announcing the appointment of T. COLLINS as Superintendent, District 4, Ontario Division, vice Allan Purvis, recently, it was stated that his office is at Toronto. It is at London.

V. T. BOUGHTON, heretofore Resident Engineer, District 2, Lake Superior Division, Chapleau, Ont., has been appointed Resident Engineer, District 1, Lake Superior Division, vice H. R. Miles, transferred. Office, Sudbury, Ont.

A. O. WOLFF has been appointed Resident Engineer, District 2, Lake Superior Division, vice V. T. Boughton, transferred. Office, Chapleau, Ont.



M. W. Bard,
Assistant Superintendent, District 1, Eastern
Division, Canadian Pacific Railway.

W. J. STINSON, heretofore Trainmaster, District 5, Eastern Division, Smiths Falls, Ont., has been appointed Assistant Superintendent, District 3, Lake Superior Division, vice T. A. Wilson, transferred. Office, Schreiber, Ont.

D. WILSON, heretofore section foreman, District 1, Lake Superior Division, has been appointed Roadmaster Schreiber Subdivision, Lake Superior Division, vice N. Berger, transferred. Office, Schreiber, Ont.

A. J. IRONSIDES, heretofore District Master Mechanic, Edmonton, Alta., has been appointed District Master Mechanic, Winnipeg, vice G. Twist, transferred.

C. HOOD, heretofore Trainmaster, Nelson, B.C., has been appointed Trainmaster, Saskatoon, Sask.

G. TWIST, heretofore District Master Mechanic, Winnipeg, has been appointed District Master Mechanic, Medicine Hat, Alta., vice A. West, transferred.

A. WEST, heretofore District Master Mechanic, Medicine Hat, Alta., has been appointed District Master Mechanic, Ed-

monton, Alta., vice A. J. Ironsides, transferred.

J. D. FRAINE, heretofore conductor at Medicine Hat, Alta., has been appointed Trainmaster, Nelson, B.C., vice C. Hood, transferred.

G. C. MCKAY, heretofore City Passenger Agent, Chicago, Ill., has been appointed City Passenger Agent, Detroit, Mich. W. C. ELMER retains the position of City Ticket Agent at Detroit.

D. I. LISTER, heretofore chief clerk, Passenger Department, Chicago, Ill., has been appointed City Passenger Agent, Chicago, Ill., vice G. G. Mackay, transferred.

K. A. COOK has been appointed chief clerk, Passenger Department, Chicago, Ill., vice D. I. Lister, promoted.

Canadian Pacific Ocean Services, Ltd.—J. R. SHAW, heretofore Passenger Agent, Manila, has been appointed General Agent, Passenger Department, Shanghai, China, vice A. J. Blaisdell, deceased.

G. L. COURTNEY, heretofore of Greer, Courtney & Skene, Ltd., Shipping Agents, Vancouver, B.C., has been appointed to a position at Hong Kong, China.

Central Vermont Ry.—P. D. FITZPATRICK, Valuation Engineer, has also been appointed General Roadmaster, vice W. P. Elrod, resigned. Office, St. Albans, Vt.

H. P. BOYCE has been appointed Travelling Passenger Agent, St. Albans, Vt., vice S. M. Driscoll, resigned. (See also Grand Trunk Ry.)

Grand Trunk Ry.—R. E. ORR, heretofore acting Trainmaster, has been appointed Trainmaster, Districts 8, 9, and 10, Belleville Division, Ontario Lines. Office, Lindsay, Ont.

R. A. GILL, heretofore Soliciting Passenger Agent, Portland, Me., has been appointed Travelling Passenger Agent, Toronto, reporting to the District Passenger Agent there.

C. S. PROCTOR, heretofore Travelling Passenger Agent, Toronto, has been appointed as a special representative of the Passenger Department at Camp Borden, Ont., reporting to the District Passenger Agent, Toronto.

R. W. THOM, heretofore agent at Collingwood, Ont., has been appointed agent at Camp Borden station, Ont.

A. M. DURNFORD has been appointed agent at Collingwood, Ont., vice R. W. Thom, transferred.

G. L. BRYSON, heretofore chief clerk, City Office, Detroit, Mich., has been appointed Travelling Passenger Agent, Kansas City, Mo., vice C. N. Wilson, resigned.

W. GRANT, heretofore joint ticket agent, Central Vermont Ry., and New York, New Haven & Hartford Rd., New London, Conn., has been appointed Travelling Passenger Agent, G.T.R. and Central Vermont Ry., Boston, Mass., vice J. M. Shea, resigned.

Grand Trunk Pacific Ry.—W. P. HUTCHISON, heretofore Resident Manager, Macdonald Hotel, Edmonton, Alta., has been appointed Resident Manager, Fort Garry Hotel, Winnipeg.

J. V. HENDERSON has been appointed Resident Manager, Macdonald Hotel, Edmonton, Alta., vice W. P. Hutchison, transferred.

National Transcontinental Ry.—W. N. INGRAM has been appointed acting Mas-

ter Mechanic, District 5, Edmundston, N.B.

A. V. REDMOND, formerly in service of N.T.R. Commission, has been appointed Resident Engineer, District 2, Cochrane, Ont., vice H. J. Black, enlisted for overseas service with No. 1 Construction Battalion.

M. J. SHERIDAN, heretofore Roadmaster, Hearst Subdivision, Grant, Ont., has been appointed Roadmaster, Cochrane Subdivision, vice P. Houston, transferred. Office, Cochrane, Ont.

P. HOUSTON, heretofore Roadmaster, Cochrane Subdivision, Cochrane, Ont., has been appointed Roadmaster, O'Brien Subdivision, vice W. R. Murray, resigned. Office, Cochrane, Ont.

G. DUFF has been appointed Road-

master, Hearst Subdivision, vice M. J. Sheridan, transferred. Office, Grant, Ont.

Niagara, St. Catharines & Toronto Ry.—A. S. DAVIS has been appointed City Passenger Agent, for the summer, at Niagara Falls, N.Y.

Timiskaming & Northern Ontario Ry.—W. H. HARPER has been appointed acting Auditor of Receipts and Car Accountant, vice R. H. Mitchell, Auditor and Car Accountant, enlisted for active military service. Office, Toronto.

T. J. GRACEY, heretofore Accountant, has been appointed Auditor of Disbursements and Accountant. Office, Toronto.

H. W. TESKEY has been appointed Freight Claims Agent and Chief Clerk to Auditor of Receipts and Car Accountant. Office, North Bay, Ont.

Traffic Orders by the Board of Railway Commissioners.

Interswitching at London.

25050. June 10. Re application of London Railway Commission for an order requiring the G.T.R. to interswitch cars from the London & Port Stanley Ry. to the G.T.R. steam tracks under the provisions of an indenture dated April 25, made 1870, between The Great Western Ry. of Canada and The London & Port Stanley Ry. Upon hearing the applica-

der sec. 29 and 227 of the Railway Act, for authority to connect its tracks with the C.P.R. tracks near Chaudiere Jct., and for an order rescinding that portion of order 7490, July 6, 1909, in so far as it refers to a connection with the Ottawa & Prescott Ry. tracks at mileage 56.6 west from Hawkesbury, it is ordered that the applicant company be authorized to connect its tracks with the C.P.R. tracks

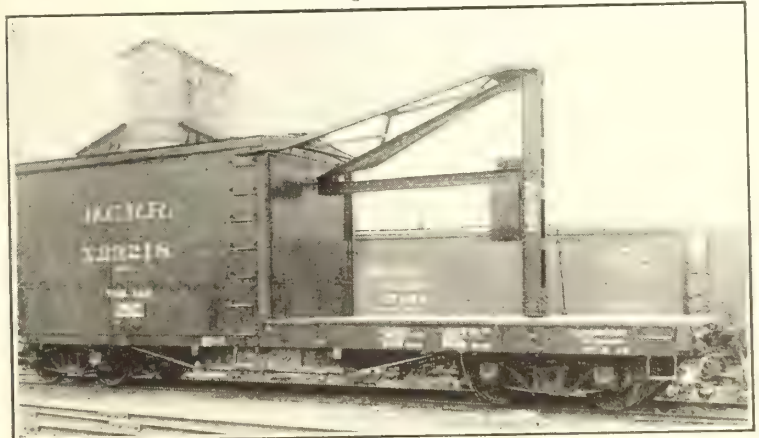
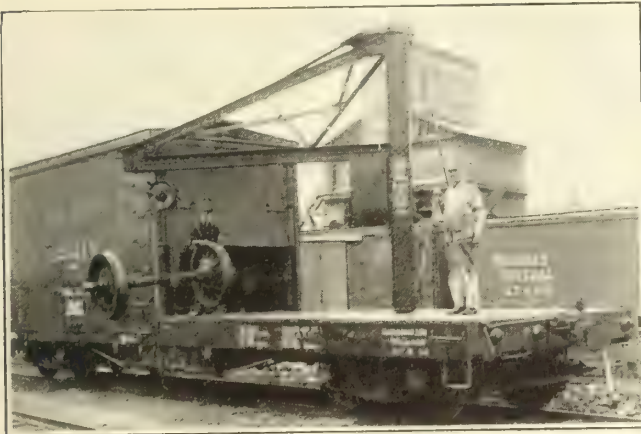
in Canada would no longer include peas. The matter as presented has a bearing on the general issue as involved in the classification, and the matter should stand until the classification is before the Board and dealt with. In view of the time the existing rate situation has existed, this disposition does not appear to be unfair to the parties.

Edmonton, Dunvegan & British Columbia Ry.'s Tariff.

25124. July 5. Re application of Edmonton, Dunvegan & British Columbia Ry., under sec. 327 of the Railway Act, for approval of its Standard Mileage Freight Tariff, C.R.C., 20, cancelling C.R.C. 1. Upon the report and recommendation of the Chief Traffic Officer, it is ordered that the said tariff be approved.

Specifications for Cheese Boxes.

25143. July 7. Re order 24188, Sept. 18, 1915, approving of proposed Supplement 5 to the Canadian Freight Classification 16; and the order 24837, Mar. 28, 1916, extending the effective date of the item on page 9 giving specifications for cheese boxes, until Aug. 1, 1916. Upon reading the submissions filed on behalf of the parties interested; and upon hearing a deputation of cheese manufacturers and cheese box manufacturers, also representatives of the Montreal Board of Trade, the Montreal Produce Merchants' Association, and the Canadian Freight Association, it is ordered that the said item be amended as follows, viz.:



Tool Car and Derrick, Michigan Central Railroad.

tion at London, Mar. 10, 1916, in the presence of counsel for the applicant and the G.T.R., and upon reading the further submissions filed, the G.T.R. offering no objection, it is ordered that the G.T.R. be required to interswitch cars as above stated; the interswitching service to become effective not later than July 10, 1916.

Copper Commodities, Rates.

25082. June 17. Re application of the Consolidated Mining and Smelting Co. of Smelter, B.C., for suspension of proposed cancellation of rates on copper commodities from Smelter to points in Eastern Canada, it is ordered that the proposed cancellation of rates on copper commodities from Smelter, Grand Forks, and Greenwood, B.C., to points in Eastern Canada, as shown in C.P.R. Tariff, C.R.C. no. W-2147, effective June 18, 1916, be suspended; and the C.P.R. is hereby required to continue in force the rates on the said commodities to points in Eastern Canada as contained in its Tariff C.R.C. no. W-2056, until further order.

Connection of C.P.R. and C.N.R. Tracks Near Ottawa.

25111. June 26. The application of the Canadian Northern Ontario Ry., un-

der sec. 29 and 227 of the Railway Act, for authority to connect its tracks with the C.P.R. tracks near Chaudiere Jct., and that order 7490, July 6, 1909, in so far as it refers to a connection with the Ottawa & Prescott Ry. tracks at mileage 56.6 west from Hawkesbury, be rescinded.

Rates on Split Peas.

Commissioner McLean gave the following judgment June 27: The application of Montreal Board of Trade for an order directing that the rates published for the carriage of grain products from Ontario to points in the eastern States be applied also on split peas, and re application of Montreal Board of Trade for disallowance and of the Toronto Board of Trade for suspension of the schedules removing whole peas from the list of articles which take grain rates from and to the aforesaid territories. In this matter, it appears that in the new Canadian Freight Classification which the railways are preparing it is proposed to remove dried peas, whole and split, from the grain section to the vegetable section, thus following the example of the American classifications. While the rating will, as proposed, remain the same as at present, viz., 8th class, the effect would be that tariffs for the movement of grain

Paragraph (a): Add at the end of the paragraph the words, "or four pieces if tongued and grooved."

Tool Car and Derrick, Michigan Central Railroad.

The Michigan Central Rd.'s Canada Southern Division Car Department at St. Thomas, Ont., E. R. Webb, Master Mechanic; N. Marple, General Foreman, have constructed a tool car and derrick for road work at outlying stations where no repair equipment is maintained. The car is a low flat 40 ft. 60,000 lb. capacity standard equipment, and is equipped with derrick and boom and triplex hoist of 2 ton capacity, occupying half the car. The opposite end is enclosed, giving sufficient room for 8 pairs of wheels, jacks, blocking and other necessary equipment, consisting of emergency first aid box, blue flags, lanterns, etc. The primary use for this car is prompt repairs to cars set out along the line, greatly facilitating the handling of wheels and material. We are indebted to J. Jackson, Foreman Repair Tracks, for the foregoing information.

Grand Trunk Station and Office Buildings at Black Rock, N.Y.

The G.T.R. has completed recently the construction of new passenger station and freight office buildings, at Black Rock, a suburb of Buffalo, N.Y., to replace the wooden buildings that had been in service for a number of years, and also to accommodate the increased business at that station. Black Rock is both a customs and immigration port of entry to the United States and in the erection of the new station, quarters were provided for the use of both departments of the government service. The passenger station, customs and immigration offices are combined in one building on the north side of the tracks, and a separate building has been provided, on the opposite side of the tracks, for the agent and his clerical staff. Both buildings are two story brick structures with concrete basements. The passenger station is 118 ft. 7 in. x 35 ft. 1 in., and the freight office building is 117½ ft. x 33 ft. Both have been designed in such a manner as to permit of an additional story being added to them should necessity arise for addi-

the street entrance and connect directly with the general freight offices. A large record room has been provided on the ground floor in the east wing. On the first floor above there is another general freight office 1,443 sq. ft. in area. Accommodation has been provided in the west wing for the Superintendent of Terminals, cashier and their staffs. In the east end a women's rest room and lavatory have been provided. In the basement the men's lavatory, cloak room, furnace room, coal storage and large record room.

The two buildings are precisely of the same construction and finish. The foundation walls are of concrete carried on wooden piles. The basement walls, to the height of the ground floor window sills, are of rock faced Medina sandstone, and the remainder of the exterior walls are of rough texture facing bricks, with sandstone trimmings. The floors in the basement, lavatories, staircases, halls and baggage rooms are of concrete with mastic finish. Tile floors have been laid in the entrance halls and general waiting

Election of Canadian Electric Railway Association's Officials.

After the report of the proceedings of the C. E. R. A. meeting appearing on page 340 had gone to press, the following officers were elected unanimously,—

President, E. P. Coleman, General Manager, Dominion Power & Transmission Co., Ltd., Hamilton, Ont.; Vice President, C. L. Wilson, Assistant Manager, Toronto & York Radial Ry., Toronto; Honorary Secretary-Treasurer, Acton Burrows, Managing Director, Canadian Railway and Marine World, re-elected for the tenth consecutive year.

Executive Committee, The President, the Vice President, the immediate past President, J. D. Fraser, the Honorary Secretary-Treasurer, and the following,—A. Eastman, Vice President and General Manager, Windsor, Essex & Lake Shore Rapid Ry., Kingsville, Ont.; H. G. Matthews, General Manager, Quebec Ry., Light, Heat & Power Co., Quebec, Que.; G. Gordon Gale, General Manager, Hull Electric Co., Hull, Que.; A. Gaboury, Superintendent, Montreal Tramways Co., Montreal; J. F. Mackenzie, Purchasing Agent, Winnipeg Electric Ry., Winnipeg.



Passenger Station and Freight Office Buildings, Grand Trunk Railway, Black Rock, N.Y.

tional space in the future, and a reservation has been made for elevators to be installed in each whenever a third story is added.

The ground floor of the passenger station comprises a general waiting room the full width of the building, a women's waiting room connecting thereto, ticket office, entrance hall and staircase, all in the central portion of the building. The customs offices are confined to the west and with a separate entrance from the track frontage and a passageway connecting with the long entrance hall. The ground floor of the east wing has been entirely reserved for the handling of baggage. All of the first floor is assigned to the immigration department, each room communicating directly with one corridor in the axis of the building. In the basement is a men's lavatory, and a large space has been set aside as a record storage room.

There are three entrances to the freight office building on the opposite side of the tracks from the station, two from Parish St. and one from a side street. The entrances from Parish St. lead directly to staircases and entrance halls, each in turn opening into a general freight office having an area of 1,600 sq. feet. The agent's office, the yard master's office, and the room occupied by the car checkers and manifest clerks are located near

rooms. The balance of the floors throughout both buildings are finished in hard maple. The interior walls are plastered throughout and the roofs are of tile.

A passenger platform of paving brick, 310 x 14 ft. wide, has been laid along the track frontage of the station and extending beyond both ends of it. The space between the eastbound and westbound passenger main tracks has been planked in for 475 ft. parallel to the station platform. An umbrella shelter, 15 ft. wide, has been erected over the brick platform. This shelter is of timber, supported by 8 x 8 in. wooden posts, with cast iron bases 3½ ft. high. The roof of the shelter is hipped and of tile, except the portion immediately in front of the building, which is glazed.

Both the station and freight office buildings and the passenger station platforms are lit by electricity and heated by the furnace located in freight offices basement. The heat is carried from the furnace in the office building to the station by a conduit underneath the tracks. The pipes in the conduit are protected by a thick coating of asbestos, enclosed in terracotta lining and covered on the outside with reinforced concrete.

Both buildings were designed and erected under the supervision of H. R. Safford, Chief Engineer, Grand Trunk Ry., Montreal.

Assistant Secretary, A. A. Burrows, Secretary and Business Manager, Canadian Railway and Marine World.

Legislation Committee,—J. W. Crosby, General Manager, Halifax Electric Tramway Co.; H. M. Hopper, General Manager, St. John Ry.; H. G. Matthews, General Manager, Quebec Ry., Light, Heat & Power Co.; J. D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Ry.; Wilford Phillips, General Manager, Winnipeg Electric Ry.; George Kidd, General Manager, British Columbia Electric Ry.

Grain Inspection at Western Points.

The following figures compiled by the Department of Trade and Commerce, show the number of cars of grain inspected on railways at Winnipeg and other points on the Western Division for June, and for ten months ended June 30, with a comparison of the number of cars inspected for ten months ended June 30, 1915.

	June	Ten months to June 31 1916	Ten months to June 31, 1915
C.P.R.	13,367	166,079	58,839
C.P.R. Calgary	336	6,405	6,330
C.N.R.	9,282	89,521	37,320
G.N.R. Duluth	120	4,965	1,382
G.T.P.R.	1,967	37,441	14,414
Totals	25,072	304,411	118,285

Canadian Pacific Railway Construction, Betterments, Etc.

Steel Rails.—The company has ordered from Algoma Steel Corporation, 30,000 tons, 85 lb. rails, for 1917 delivery. The company is also said to be in the market for 30,000 tons, 100 lb. steel rails, for this year's delivery. As Canadian mills are unable to supply them, enquiries are said to have been made in the United States.

Atlantic Division.—We are officially advised that to facilitate the handling of winter port traffic a third track is being laid from the storage yard at Bay Shore to the docks at West St. John; that additional sidings are being laid at West St. John to accommodate 350 cars; that 98 switches, 56 and 60 lb., and 7.9 miles of 56 and 60 lb. rails are being replaced with 85 lb. rails and switches, and that in connection with this work a rearrangement of switching leads is being made. At West St. John a 4,000 gall. water tank is to be replaced by a steel tank of 20,000 galls. capacity.

All passing tracks between Brownville Jct. and McAdam Jct. are to be lengthened to 3,000 ft., and an 80 ft. steel girder at mileage 43.1, St. John Subdivision, is being replaced with an 8 ft. concrete arch and fill, which together with the reinforcement of bridge 25.25, St. John Subdivision, will permit of the use of heavier locomotives between McAdam and West St. John.

At Holeb, Me., the company will erect three dwellings for the U. S. customs officers, and at Jackman, Me., an office and detention building for the U. S. immigration officers.

Eastern Division.—We are officially advised that the appropriations provide for the following works to be done during this year:—District 1.—Lay 7.2 miles of 85 lb. rails on Megantic, Sherbrooke and Farnham Subdivisions; install 25,000 shoulder tie plates on Megantic Subdivision; install 15,488 rail anchors, 85 lb., on Megantic, Newport, Sherbrooke and Farnham Subdivisions; tile drain west ends on Megantic, Sherbrooke and Farnham Subdivisions; provide electric train staff systems, Megantic to Glen River, Megantic Subdivisions, and Lennoxville to Sherbrooke and Sherbrooke to Black Forest, on Sherbrooke Subdivision; replace old culverts with concrete pipes in 109 locations in Megantic, Sherbrooke, Newport, Drummondville, and St. Guillaume Subdivisions; replace Howe truss bridge over G.T.R. at Quebec Central Ry. connection, Sherbrooke Subdivision; provide additional yard tracks at Sherbrooke; provide a Y track at Milan; for a subway and road diversion at mileage 31, Newport Subdivision; to replace pile trestles in Notre Dame St. bridge, St. Pie branch, St. Guillaume Subdivision, with 37 ft. Howe deck plate girder; and lay 13.2 miles 85 lb. rails on Newport and Drummondville Subdivisions; install electric power and plant, equipped with motor drive, in coaling plant at Farnham; tile drain wet cuts in Farnham Subdivision.

District 2.—Lay 1.75 miles, 100 lb. rails in Montreal terminals; install 5792 rail anchors, 100 and 85 lb., in Montreal terminals; provide broken stone ballast from Windsor St. Station to Ballantyne St., Montreal terminals; provide passing sidings at St. Luc; change turning machinery at Lachine Canal swing bridge; lay 1.50 miles, 85 lb. rails on St. Luc Branch.

District 3.—Install 8,640 anchors, 85 lbs., Ottawa and Quebec Subdivisions; erect a 5 ft. arch, 6 x 9 ft., Quebec Subdivision; new bridge mileage 26.2 Pile

Subdivision; lay 5.3 miles new 85 lb. rails on Ottawa, Quebec and Laurentian Subdivisions; lay 8.0 miles of 80 lb. rails on St. Gabriel Subdivision; install 60,000 tie plates Quebec and Laurentian Subdivisions; lay 2,650 ft. tile pipes in wet cuts Laurentian Subdivision; build two concrete arches on Maurice Valley Subdivision.

District 4.—Replace pier and abutments, bridge 1.9 Prescott Subdivision, install 2,148 anchors, 85 lb., in Ottawa terminals and Montreal-Ottawa Subdivisions; lay 1 mile 85 lb. rails on Montreal and Ottawa Subdivision; construct southwest Y connection at Hurdman; tile drains for wet cuts, Prescott and Maniwaki Subdivisions; ballast Sussex St. 3.75 miles; and on Prescott Subdivision, 8.75 miles; saw and relay 6.9 miles of 80 lb. rails between Chaudiere Jct. and Kemp-ton diamond.

District 5.—Lay 1.1 miles of single head 100 lbs., and 6.2 miles of 85 lb. rails on Smiths Falls and Chalk River Subdivisions; install 25,000 tie plates on Chalk River Subdivision; install 10,976 rail anchors, Smiths Falls and Chalk River Subdivisions; renew old culverts with concrete in 6 locations on Eganville and Chalk River Subdivisions; rock ballast from mileage 2.6 to 19.00 Smiths Falls Subdivision; lay 4,861 ft. of 4 in., and 6,645 ft. of 6 in. tile in wet cuts at Smiths Falls and Chalk River Subdivisions; install electric alarm bell mileage 82.06, Chesterville, Smiths Falls Subdivision; lay 5 miles of 100 lb. rails and tie plates on westbound track, Smith's Falls Subdivision; additional track and alterations to Smiths Falls yard; ballast 28.5 miles Chalk River Subdivision and 108 single track miles on Smiths Falls Subdivision.

Ontario Division.—We are officially advised that the company is doing practically nothing but maintenance work on this division during this year, outside the building of the line to Camp Borden. At least two-thirds of the buildings between Toronto and Windsor will be repainted and a good deal of painting will be done on other subdivisions—the amount to be done will depend on the labor available—painters are being advertised for all along the division. The company is hauling ballast from Ayr as far west as Windsor, a better quality of gravel being obtainable at Ayr than at Komoka. It is expected that with the use of this gravel the dust nuisance will be abated very considerably if not got rid of altogether. The station at Guelph Jct. is being enlarged, an island platform being built for the Hamilton and Goderich lines traffic and to use in transferring to connecting trains from the main line. Two miles of track between Parkdale and West Toronto are being ballasted with broken stone; ballasting is to be done on the Elora Subdivision, and for a few miles on the St. Mary's Subdivision. Ballasting is nearly completed on 22 miles of the Toronto Subdivision, and on 12 miles of the Trenton Subdivisions.

Saskatchewan Division.—We are officially advised that a contract has been let to W. A. Dutton & Co. Winnipeg, for grading on the 7 mile extension from Vantage to Assiniboia. This extension will connect up the Moose Jaw-Expanse branch now terminating at Vantage, with the line west of Weyburn at Assiniboia. The maximum curvature is 2 degrees. The construction is light prairie work and there are no bridges. The extension will

be completed this season.

The work to be done at Gull Lake, between Swift Current and Medicine Hat, for which tenders for filling 12,500 cubic feet of earth were asked recently is the rebuilding of the dam.

Alberta Division.—We were officially sion from Paliwaki, mileage 75 east from Stirling, to Manyberries, Alta., would be built without delay. Contract for the grading of the additional portion has been awarded to Grant, Smith & Co., Vancouver, B.C. The balance of the work will be carried out by the company's own forces. (July, pg. 285.)

Grain Rates from Saskatchewan to Minnesota.

The Interstate Commerce Commission has issued its judgment in the case of the Spaulding Elevator Co., Warren, Minn., against the C.P.R. and the Minneapolis, St. Paul & Sault Ste. Marie Ry., re alleged overcharge on 2 carloads of oats from Assiniboia, Sask., to Warren, Minn. Following is the judgment:—Complainant is a corporation engaged in the grain business at Warren, Minn. By complaint filed Apr. 19, 1915, it alleges that the rate of 30.3c. per 100 lbs., charged by defendants for the transportation of two carloads of oats from Assiniboia, Sask., to Warren, Minn., was unreasonable and in violation of the long-and-short-haul rule of sec. 4 of the act to the extent that it exceeded a rate of 20c. contemporaneously applicable to Duluth, Minn. The shipments moved over defendants' lines in March and April, 1914, and \$424.80 was collected on 140,200 lbs. of oats, at a rate of 30.3c per 100 lbs. The tariff rate applicable was 29.8c per 100 lbs., composed of a rate of 20c to Duluth and 9.8c back to Warren, so that both shipments were overcharged. Warren is intermediate to Duluth from Assiniboia by the direct route over which the 20c rate to Duluth applied. The maintenance of a higher rate to Warren than to Duluth was not protected by any application of sec. 4. Effective Oct. 1, 1914, after the shipments had moved, the rate to Warren was reduced to 20c per 100 lbs., which rate is still in effect. Both defendants were represented by counsel, introduced no evidence in defence of the rate assailed, and neither one contests the case. We find that the 30.3c rate exceeded the tariff rate applicable and was unlawful; that the 29.8c rate legally applicable was unreasonable to the extent that it exceeded the present rate of 20c per 100 lbs; that complainant made the shipments involved as described and paid charges thereon at the rate found to have been unlawful; that it has been damaged to the extent of the difference between the charges paid and the charges that would have accrued at the rate herein found to have been reasonable; and that it is entitled to reparation from defendants in the sum of \$144.40, with interest from Apr. 10, 1914. The defendants are, therefore, ordered to pay to the complainants by Aug. 1, 1916, \$144.40 with interest thereon at the rate of 6% from Apr. 10, 1914, on account of unreasonable and unlawful charges collected for the transportation of two carloads of oats from Assiniboia, Sask., to Warren, Minn., and as the present rate has been in force for more than one year, no order will be entered for the future.

Electric Railway Department

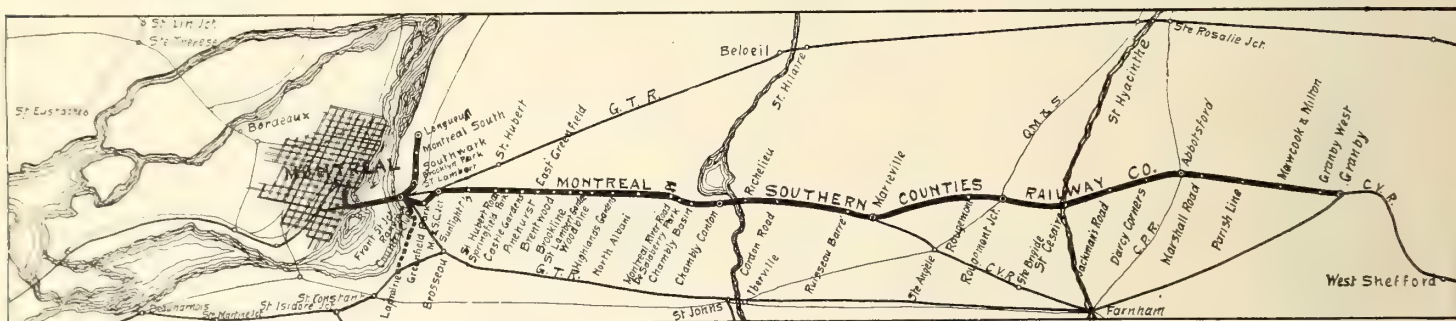
Montreal & Southern Counties Ry. Extension from St. Cesaire to Granby, Que.

The Montreal & Southern Counties is a suburban and interurban railway, connecting the south shore of the St. Lawrence River with Montreal via the Victoria Jubilee Bridge. From a limited service inaugurated in 1909 between Montreal and St. Lambert, 3½ miles, extension after extension has been added, until a large majority of the municipalities of the south shore have been linked together in this chain of development and brought in such close communication with Montreal through frequent service as to make commuting a pleasure. The inter-

pendent, due to the outbreak of war, and it was not resumed again until May 19, 1915, from which date it was carried on uninterruptedly until its completion Dec. 12, 1915. As fast as the track was laid and ballasted, the overhead construction force followed, setting poles and bonding the rails. The work of electrification was carried on by the railway company's force under the direction of G. J. Meyer, Chief Engineer and General Superintendent.

The type of construction used on this section was similar to that employed on

minimum clearance of 6 ft. from gauge. On curves this clearance is increased by 6 in. Bracket type construction was used wherever possible, and consisted of a 10 ft. T iron bracket on which is mounted a malleable iron pin and porcelain insulator which carries the messenger wire. The messenger wire is allowed to ride free in the recess in the insulator, which permits of free adjustment of line between anchors which are located every half mile. Throughout the yards and on a number of the curves cross span construction is used.



Route Map, Montreal and Southern Counties Railway.

urban arm of this development stretches easterly for 47.5 miles through the counties of Chambly, Rouville and Shefford, the present terminus being Granby, to which place the line has been extended recently from St. Cesaire, 16½ miles, the extension being opened April 30 last. The new line marks a milestone in high speed electric railway development in Canada.

Construction on the new extension was commenced in Oct. 1913, when a contract was let to Ross & McComb to build the

the previously electrified extensions. The bonding consisted of 4/0 concealed type triplex bonds with ¾ in. terminals 10 in. c.c. for compressing into web of rail.

The overhead construction is of the standard catenary type with 7/16 in. Siemens Martin grade stranded galvanized steel messenger cable, from which, at intervals of 15 ft. is supported a 4/0 B & S gauge American standard grooved hard drawn trolley wire. The hangers are of the floating type, specially designed to absorb the shocks, and consist of three

Supplementing the trolley the entire distance is a 816,000 c.m. aluminum feeder. Taps are run from this feeder to the trolley every ¼ mile. The feeder is carried on glass insulators with oak pine, which in turn are carried on 3½ x 4½ x 4 ft. B.C. fir cross arms with 1¼ x ¼ in x 3 ft. galvanized iron braces. On all curves double cross arms are used, and the wooden pins are replaced by malleable iron ones. The feeder taps consist of 2/0 stranded weather proof wire terminating in a feeder ear attach-



Two Pieces of Track Before Ballasting.

concrete piers to carry the steel bridge across the Yamaska River at St. Cesaire. This bridge, which is of a deck girder type, is 240 ft. long, supported on 4 concrete piers, 80 ft. c. to c. The steel work for the bridge was supplied and erected by the Hamilton Bridge Co. In the spring of 1914 a contract was let to Grant, Campbell & Co., for grading and laying of rails. Work was commenced on May 25, 1914, and sufficient force was employed to complete it and place the road in operation by Oct. 15, 1914. On Aug. 5, however, all construction work was sus-

bolt malleable iron Detroit ear, to which is riveted a ¾ in. wide by ½ in. thick strap iron hanger.

Within the town of Granby the construction is cross span with 28 ft. steel poles set in concrete. The poles are built up of heavy tubing 5, 6 and 7 in. diameter. The remainder of the line is constructed with 40 ft. cedar poles with 7 in. top. On tangent the poles are set 150 ft. apart, while on curves the spacing is either 75, 90, or 105 ft., according to the degree of curve.

On tangent track poles are set with a



ed to the trolley, and a 4 bolt aluminum clamp attached to the feeder. A Garton Daniels lightning arrester is installed at each feeder tap.

The telephone dispatching system already in use was extended from St. Cesaire to Granby. The line wires are no. 10 B. & S. gauge hard drawn copper wire carried on side blocks. This line is transposed every third pole in order to counteract the effect of induction. The instruments are the Northern Electric Co.'s selector type.

On the top of the same poles which sup-

port the trolley feeder and telephone, is carried the 25,000 volt transmission line. The type of construction adopted for the transmission line consists of 3 1/4 in x 5 in. x 5 ft. B.C. fir cross arms spaced 5 ft. c.c. and secured to the poles with 5/8 x 14 in. galvanized machine bolts. To the arm is also bolted a 2 1/2 ft. x 2 1/2 in. x 1/4 in. angle cross arm brace. The insulators, which are for 35,000 volt service, are supported

400 k.w. 600 volt, d.c. interpole railway generator and one 6 k.w. direct connected exciter; 3 185 k.v.a. single phase o.i.s.c. 25000/2300 volt transformers; 1 25000 volt 3 phase grounded neutral electrolytic lightning arrester; 1 200 amp. 25000 volt 3 p.s.t. automatic oil switch mounted in separate cells; 2 25000 volt 20-5 amp. oil insulated self-cooled current transformers; 9 300 amp. 25000 volts discon-

necting switches; 1 200 amp. d.p.d.t. 600 volt quick break lighting switch; 1 100 amp. 600 volt s.p. field switch with discharge clips and resistance; 1 4 point receptacle; 1 rheostat; 1 volt meter, 1 ammeter.

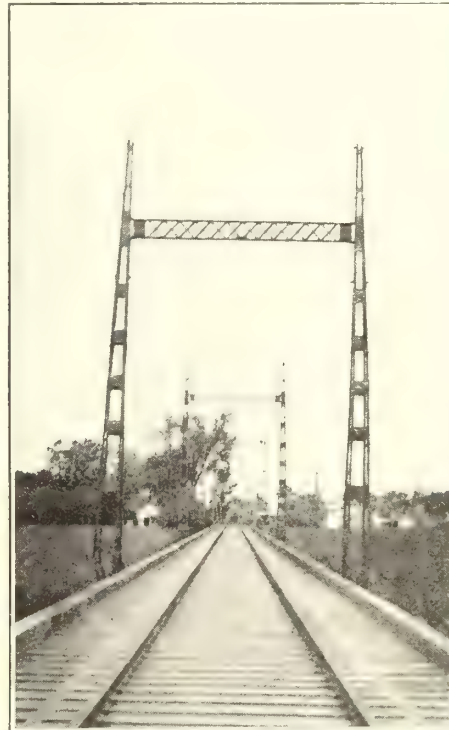
From where the a.c. line enters the building no. 1 B & S gauge hard drawn bare copper wire is used for all busses and connections on the 25000 volt side



Stringing Overhead Work.



Trimming Poles.



Steel Tower over Yamaska River Bridge.

on steel pins with porcelain bases; these insulators are placed 4 ft. c.c. On the upper arm is carried one phase and the ground wire, while on the lower arm are the remaining two phases. No. 4 B & S gauge wire is used for transmission and no. 8 B.W.G. galvanized iron wire is used as ground wire. The ground wire is grounded every 1/4 mile.

A substation 40 x 50 x 23 ft. high, was

necting switches; 3 200 amp. 25000 volt choke coils.

On the a.c. switch board is mounted the remote control for 25000 volt oil switch. The auto starting switch for synchronous motor, combination rheostat, i.e., relays volt meter ammeter, field ammeter power factor meter and field discharge switch. The d.c. board consists of two feeder panels and one

and no. 3/0 B & S gauge r.c. wire on the 2300 volt side. All leads from switch board to motor and from switch board to generator are run under ground in clay conduits. The leads themselves are lead covered, each insulated according to its respective service.

At Abbotsford the company erected a station 17 x 46 ft. It is divided into a passenger compartment, freight and ex-



Granby Substation.



Bonding the Rails.

constructed just outside the city limits of Granby. On top of the main building is a pent house 10 x 10 x 12 ft. high, with concrete entrance hoods to admit the high tension line. The building is an all-concrete steel and brick structure. The electrical equipment of this substation is as follows: 1. 2300 volt 63 cycle, 756 r.p.m. self starting synchronous motor on a common shaft and bed plate, with one

generator panel. On each feeder panel is mounted 1-1000 amp. 600 volt s.p.s.t. overhead circuit breaker. 1-1000 amp. 600 volt is s.p.s.t. quick break knife switch one choke coil and one ammeter. On one of the feeder panels is mounted one 800 amp. 600 volt watt. hour meter.

The generator panel is equipped with 1 1000 amp. s.p. circuit breaker with inverse current relay; 2 1000 amp. s.p.s.t.

press compartment and office. At Granby the company purchased a 3 story brick block, 45 x 60 ft., utilizing the main floor and basement for passenger waiting room, express and baggage.

The officers of the company are: E. J. Chamberlin, President; Frank Scott, Vice President and Treasurer; J. E. Dalrymple, Vice President; J. A. Yates, Secretary, W. B. Powell, General Manager.

Some Difficulties of Snow Plough Operation.

A series of questions were addressed recently to the American Electric Railway Association's question box, regarding some difficulties experienced by one of the member companies in dealing with an unusually heavy fall of snow. Replies to the various questions tasked were sent in by W. G. Murrin, General Superintendent, British Columbia Electric Ry., Vancouver, which are summarized as follows: The speed of the plough is an important factor in throwing the snow over the banks that form on the sides of the track. The curvature of the moulding boards varies with the speed. A fairly high speed with a 6 in. fall of snow will require a moulding board which is curved forward at the top until the metal at the edge has assumed a horizontal position. This will result in throwing the snow, and not merely lifting it up to fall back again after the passage of the plough. There is no reason apparent for the truck frames on snow ploughs being above the journals instead of below, or vice versa, the company's standard trucks are the best to use. The motors on the snow plough should have a clearance of 2 ins. over the rail level. The nose and bottom edge of the plough usually extends down within less than 2 ins. of the rail, therefore if the motor is 2 ins. from the rail, the nose of the plough will remove the snow to a sufficient depth to allow the motors to clear. No substitute has been found for rattan on the sweepers. The best course is to find a substitute for the sweepers, viz., ploughs, which do not have rapidly wearing parts such as rattan. Ploughs with flangers and wing boards properly designed and operated promptly after snowfall begins are more reliable and will do far more work than sweepers. In the British Columbia Electric Ry. service, snow ploughs have been attached to pilots on 50 ton locomotives in regular service, and 4 ft. drifts of snow have been successfully removed. These ploughs follow the general lines of the pilot, nose type and have high moulding boards. A flanger between front and rear trucks has been tried. This is, of course, of the shear type, raised and lowered by means of chains up through the floor into the cab, and anchored by means of rods and pins to the underframing. Due to the lack of holding down weight, this flanger would rise and jump to such an extent that it was not a success.

Passenger Shelter at Sunnyside, Toronto.—R. C. Harris, Works Commissioner, Toronto, and a representative from the city's legal department, attended before the Ontario Railway and Municipal Board, to explain why the city had not carried out the Board's order to erect a passenger shelter at Sunnyside, near the point where passengers change from the Toronto Ry. to the Toronto and York Radial Ry. cars. The portion of the line affected by the order is the old Toronto and Mimico line, which was absorbed by the Toronto and York Radial Ry. and since the expiry of the franchise, has continued to be operated by that company under agreement with the city. D. M. McIntyre, K.C., the Chairman of the Board, in giving his opinion of the matter, said that "the onus for the state of affairs, as described, rests upon the City of Toronto alone, and I regret very much that I am unable to go further and order a shelter to be provided, and to which the public is entitled."

Toronto Suburban Railway's Deviation and Connection at Lambton.

The application of the Toronto Suburban Ry. Co., to the Ontario Railway and Municipal Board, for approval of the deviation of its Dundas St. line, at Lambton Mills, York Tp., near Toronto, to a private right of way, according to plans filed, in order to connect the existing line with the extension to Guelph, now under construction, was dealt with by the Board in a judgment delivered June 20, which covered the history of the company from its incorporation in 1894, under the name of the Toronto Suburban St. Ry. Co. Under its charter it acquired the City Suburban Electric Ry. and the Davenport St. Ry. with all assets and franchises, and was empowered to build railways along certain highways in the township. In 1904 the company had built and was operating certain lines, among them being the one covered by the application, along Dundas St., to, or near, Lambton Mills, from the limits of the City of Toronto. The line at Lambton Mills terminates in a loop, partly on the highway and partly on private right of way. In 1904 the company obtained legislation authorizing it to build a railway from Hamilton, with a branch from Weston to Woodbridge, and also from Weston, or Lambton Mills, to Brampton. A section of that act empowered the company to deviate its line from the highway, provided that no obstruction of the highway shall occur by reason of the deviation, and if the rails of such deviation shall not rise above, or sink below, the ground more than one inch, there shall be deemed to be no obstruction. This right to deviate the line from the highway was made subject to the consent of the municipality concerned, or if such consent is refused, or withheld for two months from the date of the application, then the consent of the Railway Committee of the Ontario Legislature must be obtained. This power was subsequently transferred from the Railway Committee to the Ontario Railway and Municipal Board. The plans filed by the company show the track along Dundas St. as it existed in 1904, and the proposed deviation from the highway to its private right of way at Lambton Mills, and also show the extension of the railway westerly along a private right of way, which is now practically completed to Guelph, and which will serve in part as a link to connect the railway in York Tp. with Brampton, as authorized by the act of incorporation. The City of Toronto, as well as York Tp. was represented at the hearing, owing to certain annexations having brought part of the track in question within the city boundaries. After consideration, the Board declared that there was no valid ground upon which it could withhold the approval sought. No language could be plainer than that of the company's act of incorporation, when the construction of certain lines was specifically authorized, and in the exercise of which authority the company has built a line from Lambton Mills to Brampton. It was urged that the power of the railway to extend its line along any highway is conditional on the consent of the municipality being gained, and that no such extension shall be made without that consent. This is met by the provisions of another section of the act which authorize the company to deviate from the highway to a private right of way, and under the act, this deviation at Lambton Mills, is, in the

Board's opinion, expressly authorized. It is also expressly provided that the deviation shall not be made without the consent of the municipality, and in the event of such permission being refused, the matter shall be decided by the Railway Committee of the Legislature, whose powers are now vested in the Ontario Railway and Municipal Board. The City of Toronto objected on the ground that the radial, or interurban cars would be operated over the street surface tracks, which are now within the city limits, and that the intermingling of the company's local and through traffic would unduly interfere with the local service and introduce conditions of danger that should not be tolerated. On this point the Board felt that if the company has under relevant agreements the legal right to operate its radial or interurban cars over its surface lines in the city, the Board has no power to deprive it of that right, and observation of street railway operation in such cities as Buffalo, Detroit and Cleveland, leads to the conclusion that interurban cars may be operated with safety and without material disturbance of the local service, over surface tracks in large cities. The Board's engineer has viewed the plans and the site of the deviation, and reports that the plan may properly be approved by the Board. At the hearing, York Tp. made no objection to the plan and suggested no alteration to it. The Board decided to issue an order approving the plan and ordering the company to make the deviation subject to the condition of sec. 7 of the Act of 1904 as to non obstruction of the highway. No costs were granted to either party, the applicant, the Toronto Suburban Ry., being ordered to pay \$15 for the stamps on the order.

Regina Municipal Ry. Earnings, Etc.

Following are statistics for June, compared with June, 1915, and the total for six months ended June 30:—

	June 1916.	June 1915.	Jan. 1 to June 30, 1916.
Total revenue ..	\$15,368.55	\$12,311.85	\$103,477.99
Expenses ..	14,044.11	13,658.56	98,970.38
Capital charges..	8,963.80	9,137.58	53,782.80
Operating surplus	1,324.44	.....	.....
Operating deficit ..	.....	1,346.61	4,507.61
Total deficit	7,639.36	10,484.19	49,275.19
Expenses per car mile without power ..	13.65	13.93	16.56
Expenses per car mile with power	17.95	18.09	22.08
Platform wages per car hour...	70.47	74.17	72.77
Passengers carried	353,794	257,994	2,313,569
Expenses less capital charges, percentage . . .	91.38	.....	.....
Expenses with capital charges, percentage . . .	149.71	.....	.....

Freight Distribution by Trackless Trolley Cars. A press report states that the Bradford, Eng., municipality, which owns and operates the tramways and trackless trolley cars in that city, has inaugurated a general freight traffic system throughout the city, by means of trackless trolley cars. Merchandise of any description and weight is conveyed and the cars are equipped with accumulators supplied through the trolleys, so that they may be operated off the regular routes when necessary to make deliveries away from the overhead equipment.

Ottawa Electric Railway Makes New Agreement with its Men.

The Ottawa Electric Ry.'s conductors and motormen having applied to the Minister of Labor for the appointment of a Board of Conciliation and Investigation under the Industrial Disputes Investigation Act, 1907, the same was constituted, consisting of G. F. Henderson, K.C., representing the company; A. E. Fripp, K.C., M.P., representing the men; and H. P. Hill, who was chosen by the other two and who acted as chairman.

The Board reported July 10 as follows: "We have succeeded in working out an agreement between the company and the men, which is appended hereto. The outstanding feature of this agreement is a change from a 10 hour to a 9 hour day, coupled with an increase of 3c. an hour in the rate of wages, together with a provision for payment of Sunday rate on legal holidays. The granting of this increase by the company, of course, involves a large expenditure, and it was not without considerable difficulty that we were able to bring about this result. The change to a 9 hour day, with the increase above stated, means that the older men get the shorter day without any loss of income, while the younger men get a substantial increase of income. The company was induced to consider this increase in consideration of the fact that during this particular season their source of labor supply is the identical class of men who are expected to offer their services in the defence of the Empire, and it was therefore eminently desirable that nothing should occur that would tend to strain relations between the company and its men. We have reason to believe that the men will now appreciate the fact that the company has acted in such a way as to justify the continuance of the conspicuously harmonious relationship between this company and its men, of which the men have been in the past perhaps even more proud than the officers of the company."

Following is a comparison of the old and new rates per hour:

	Old	New
1st year	23c	26c
2nd year	24c	27c
3rd year and afterwards	27c	30c
Sundays extra	2c	4c
Legal holidays extra .....	..	4c

In their application for a board of conciliation, etc., the conductors and motormen asked for the following pay per hour: Weekday work performed between 6 a.m. and 12 midnight 32c.; weekday work performed between 12 midnight and 6 a.m., 37½c.; Sunday work, 35c. The shop and shedmen asked for pay ranging from 25c to 30c an hour.

Following is a summary of the agreement: The superintendent will receive the men's "grievance committee," at any reasonable time to discuss matters arising between the men and the company.

For motormen and conductors, all runs shall be divided into regular and relief runs, and shall conform as nearly as possible to a 9 hour day. The superintendent will post in the men's waiting room a list of employes in order of seniority, with a schedule of runs. Motormen and conductors shall then have the right, subject to the Superintendent's satisfaction, to choose such runs as they prefer, the senior men to have first choice and so from time to time until all have chosen. Any man failing to make his choice within a time satisfactory to the Superintendent shall forfeit his right to make it and may be allocated to such route as the Superintendent may think proper.

Employees who are members of any committee of the employes or who are officers of any association of the employes, or delegates to conventions of street railway men shall be entitled to leave of absence for the purpose of attending conventions or of doing such committee work or other work as may be necessary, without losing seniority.

Clothing for conductors and motormen shall consist as follows: Summer—Full suit, coat, waistcoat, and trousers. Winter—Trousers every year, overcoat every second year. The company will pay full cost of clothing for all men in service over one year, and half the cost of those in their service first year, uniforms to be supplied not later than May 1 and Oct. 15 in each year. After any article of clothing has been in the possession of a conductor or motorman for three months, it shall become his absolute property. Uniform caps and badges will be supplied by the company without charge.

An employe violating the company's rules shall be warned, when off duty, by the Superintendent, against a recurrence of the same offence, and in the event of the employe being suspended, his case shall be dealt with by the Superintendent, save that any employe suspended or discharged shall have the right to appeal to the President in person, or through the grievance committee, and any employe suspended or discharged and who, upon investigation, is found not guilty of sufficient cause to warrant such suspension or discharge, shall be reinstated to his former position and be paid in full for all lost time.

Cars shall be sent out each morning and night to convey employes to and from their work, the cars to be run on Somerset, Bank, Hull, St. Patrick, Sussex and Gladstone lines. The company shall, where practicable and subject to its regulations, provide seats for motormen and conductors on all cars. All cars shall be equipped each morning, before taken out, with sand, switch bars, brooms, dusters, or any other necessary articles, and all cars, cushions and windows shall be cleaned and in proper condition to go upon the street each morning, the equipping and cleaning of cars to be done by shed men employed for that purpose. Employes shall be given free transportation at all times and on all the company's lines.

The company will not call on any conductor or motorman to perform extra work in excess of his regular schedule day's work of 9 hours except in cases of necessity. Men will not be expected to work beyond a full day's work unless they are agreeable to do so. Motormen and conductors who consent to run extras or trippers before or after day's work shall be paid double time for same. All spare men who show up at the shed for work at 6 a.m. or 6 p.m. and who fail to procure work shall be allowed one hour for so turning up.

Any shop or shed man who works upon a Sunday and who gives at least one day's notice of his desire to be allowed off for one day during that week, shall be so allowed, if practicable, in the Superintendent's opinion. Conductors and motormen required to work on New Year's Day, May 24th, Dominion Day, Christmas Day, Civic Holiday, Thanksgiving Day, or Labor Day, will be paid at Sunday rate.

The company will supply conductors with tickets and change to the extent

of \$35. Students practising as conductors will be required to furnish their own change. The company will furnish a bulletin board in the conductors' and motormen's waiting room upon which employes are to be permitted to post notices of meetings of employes or of any other matters affecting their welfare.

Wages for conductors and motormen shall be as follows: 1st year's services, 26c an hour for week days; 2nd year's service, 27c; 3rd year's services and upwards, 30c. In addition to the foregoing rates, 4c an hour extra to be paid for Sunday work.

Nine hours shall constitute a day's work for all shop and shed men, and the schedule shall be so arranged as to allow one hour off for dinner. No shop or shed men will be required to work more than the regular day's work of 9 hours except in case of necessity. The present shop rules will not be amended except after conference with the grievance committee. Shop and shed men working on Sundays will receive 4c an hour in addition to their regular rate. No man shall work out of his regular turn unless at the request of a representative of the company, and if he works on Sunday out of his regular turn, he shall be paid time and a half. Shop and shed men will be paid Sunday rate of 4c an hour extra for work on all legal holidays. All shop and shed men will receive an increase of 3c an hour in excess of the wages which they are receiving at the date of this agreement. Any shop or shed men called upon to work for more than 9 hours in any day shall be paid at the rate of time and a half for such excess service, except in the event of his being required to work all night when he shall be paid double time from 6 p.m. to 6 a.m.

The company has no objection to any employe being a member of Division 279 Amalgamated Association of Street and Electric Railway Employes of America, and will not discriminate against any employe by reason of his being a member of that organization.

Sunday hours of conductors and motormen are to remain as they are at present. The pits in the sheds shall be equipped with board platforms. The schedule of running times shall be so rearranged as to provide for a lay over of 2 minutes at the end of each run.

All conductors and motormen shall be entitled to not more than 3 months leave of absence in any one year without losing seniority, provided that no conductor or motorman shall receive leave of absence unless his reason for applying for such leave is satisfactory to the Superintendent and is for a time which is satisfactory to the Superintendent, and that the number applying for leave of absence shall not at any time, in the Superintendent's opinion interfere with the practical working of the system.

The paying of the men shall be commenced at 2 p.m. instead of at 4 p.m. as heretofore.

The agreement shall continue in force and be binding on the respective parties until June 30, 1918, and so from year to year after unless and until either party desires a change in it, in which case such party shall notify the other party of the desired change at least 30 days prior to the ending of any year. A notice given to the Minister of Labor under the provisions of The Industrial Act, 1907, and amendments thereto, shall be treated as a notice under this section.

Lethbridge Municipal Railway Operating Results.

The following information is taken from the Commissioners' and Auditors' reports of the City of Lethbridge, Alta., for the calendar year, 1915:

	1914	1915
Expenditure	\$83,255.89	\$71,582.41
Revenue	46,053.56	41,740.51
Deficit	\$37,202.33	\$29,841.90
Gross receipts	\$45,333.00	\$41,020.51
Operating expenses	48,810.00	38,199.01
Operating expenses percentage of earnings, per cent.	108	93.12
Net earnings (exclusive of interest, sinking fund, insurance and taxes)		\$2,821.50
Net loss (exclusive of interest, sinking fund, insurance and taxes)	\$3,477.00	
Passengers carried	1,054,848	844,307
Average daily receipts	\$124.20	\$112.38
Transfers	184,481	49,938
OPERATION AND MAINTENANCE CHARGES.		
Car service	\$11,277.90	
Employees' insurance	144.21	
Electric power	14,864.80	
Track cleaning	1,516.94	
Car house expense	572.79	
Car barn shops	33.06	
Employees' uniforms	340.21	
Sundries . . . . .	.64	
		\$28,750.55
Cars	\$3,307.18	
Motors	1,420.84	
Brakes	531.30	
Tracks	1,080.65	
Overhead	220.11	
Buildings	14.05	
Miscellaneous	106.09	
Tools	14.83	
		6,695.05
		\$35,445.60

ADMINISTRATION AND MISCELLANEOUS CHARGES.

Salaries	\$1,683.75
Printing and stationery	158.09
Advertising	92.91
Amusements	33.59
Office expense	84.57
General expense	232.34
Commission on debenture coupons	46.44
Damage claims	176.32
Audit fee (proportion)	245.40
	2,753.41

FIXED CHARGES.

FIXED CHARGES.		
Debenture interest		\$18,801.50
Sinking fund		8,756.30
Insurance		682.41
Taxes		5,143.19
		<hr/>
		\$33,383.40
		1914
Passengers carried	1,054,848	844,307
Car miles	357,938	294,164
Revenue per car mile	12.87c	14.19c
Total cost per car mile	23.26c	24.33c
Passengers per car mile	2.95c	2.87c
Average fare per passenger	4.22c	4.77c

The auditors say in their report:—"The result of the operation of the street railway for the year is a net deficit revenue of \$29,841.90, which has been provided for as in recent years, by taxation. In spite of a diminished revenue the result is a considerable improvement over that returned in 1914. This is largely attributable to reduced operation charges resulting from the change to the one-man system of cars put into effect in the latter part of that year. It was found necessary during the year, owing to the increased cost of electrical power, to increase the charges to this department for that service from 2 to 2½c per k.w.h., which has meant an additional charge for power amounting to \$4,054.00."

The Saskatoon, Sask., City Council has approved its finance committee's recommendation to grant an increase of pay to new hands on the Municipal Ry., from 26 to 27c. an hour. The men asked for an all round return to the old schedule, but the committee decided that the rate paid for all hands, save beginners, compares favorably with that paid in the other prairie cities.

Toronto Railway Company's Rights on North Yonge Street.

As stated in Canadian Railway and Marine World for July the Judicial Committee of the Privy Council on June 23 dismissed the City of Toronto's appeal against the Ontario Railway and Municipal Board's order authorizing the Toronto Ry. to extend its tracks on Yonge St. from just south of the C.P.R. crossing at North Toronto station to Farnham Ave., so as to make close connection with the Toronto and York Radial Ry.'s Metropolitan Division. The judgment which was given out June 26 is summarized as follows:—

Their Lordships remark that the real substance of the dispute depends upon the construction of the agreement of Sept. 1891, between the corporation and the predecessors of the respondents, which granted powers creating street railways. On June 25, 1915, the rights of the Metropolitan St. Ry. ceased over that portion of Yonge St. brought within the city boundary in 1887. Respondents accordingly claimed, in virtue of their agreement, that they were then entitled for the residue of the term to use this portion of the street. Appellants deny that the agreement conferred any such right, asserting that at the date of the agreement the corporation had no power legally to grant any franchise over this portion of Yonge St., consequently the only rights conferred in respect of this area were those which would have arisen if the grant to the Metropolitan Ry. made by York County, had for any reason been found to have been invalid and void.

Their Lordships are quite unable to take this view. No question whatever existed and no doubts had arisen concerning the rights possessed by the Metropolitan. At the date of the agreement the municipal authorities had full power to deal with the franchise of these roads in such a manner as they thought would best serve the interests of the inhabitants. The grant, therefore, was to run street railways in the city for a total of 30 years, with absolute exception in respect of the Island, and a limited exception in respect of those parts of Yonge and Queen Sts. where exclusive rights had been granted by the County of York. The only color of explanation that can be given by the appellants of the distinct grant on the part of the city over the excepted portion of the street is that to which reference has already been made, namely, that the grant to the Metropolitan might be declared to be void, or to have ended before Sept., 1891, a contingency which nobody contemplated, and which there was no reason or justification to apprehend.

The only meaning, in their Lordships' opinion, which the agreement is capable of bearing is that the grant it contained, which was made for good consideration, was a grant which would take effect whenever such antecedent's rights were, for any reason, to cease. It has been suggested in argument that such grant would be beyond the powers of the corporation, as creating a reversionary interest in the franchise of the roads. No authority whatever was produced to aid this contention. Their Lordships are unaware of any principle that could be invoked in its support. It is also said that such power is open to abuse, as, doubtless, are all powers enjoyed by municipal authorities, but it would be a wrong and dangerous method of determining the true limits of such powers to consider the

mischief their improper exercise might produce.

Their Lordships consider that the agreement itself does not, when once the facts are understood, present any real difficulty. It is the manner in which these rights have been confirmed by the statute which gives rise to the only question of uncertainty. The statute, then, in their Lordships' opinion, merely expresses in clumsy and obscure language exactly the same conditions as those expressed in the original agreement. The right and privilege, if any, over the excepted portions of Queen St. which the city at the time and execution of the agreement had power to grant, were rights and privileges, to commence when the existing franchise ended. It is quite true that if that franchise ran its full length, apart from the act of Parliament, there would have been no right or privilege which the corporation could grant at all, but the statute must be read in the light of fact. That agreement was thereby validated and the right and privilege which the corporation had power to grant at the date of agreement must be construed as meaning the right and privileges which the corporation had the power to grant, assuming that the agreement itself was legalized.

The appellants urged strongly that this gave no effect to the words "if any," and that due effect can only be given to these by making the assumption that in certain circumstances no such rights could be enjoyed by the corporation, and this assumption can, they urge, only be satisfied by regarding the grant as one to take effect if existing grants were void, but if assumptions are to be made for which there is no warranty of facts, it would be just as reasonable to assume that the period of existing grants might cover, or be extended so as to cover, the whole period of 30 years. In that case the words "if any," would have just as sensible a meaning as on the other hypothesis. In truth, the words are often needlessly used by way of caution, and it would be unreasonable to give them such weight as to destroy the obvious meaning of the statute or document in which they are contained.

The view expressed by their Lordships was taken by the Ontario Railway and Municipal Board, and in the result by the Supreme Court, but their Lordships think the appellants were right in urging that the judgment of the Supreme Court did not depend upon any independent investigation of the matter, but that they regarded themselves as bound by the judgment of this board in a dispute which related to rights over the portion of Queen St. where a similar question arose in the case of Toronto Ry. v. Corporation of Toronto. In forming this view, their Lordships think the Supreme Court was in error. The judgment referred to did not proceed upon this basis, but upon a ground entirely independent, whether the grant were made subject to rights over Queen St. or no. Throughout this judgment, reference only should have been made to Yonge St. A question of principle which governs one governs others, and there is no need for separate consideration of a second street.

The work of preparing the track allowance on the length of roadway involved is being carried out by the City Works Department, and when this is completed the Toronto Ry. will lay the tracks.

Calgary Municipal Railway's Future.

The last report of the Controller shows that the deficit from the operation of the Calgary Municipal Ry. continues to pile up. In a statement to the press on July 11, Commissioner Graves is reported to have said: "There is too much false optimism. We must exercise sound business judgment. I am an optimist so far as the future of the city or of the country is concerned, yet I am sure we need to exercise the greatest caution and economy for the next four or five years. The people of Calgary are no different from the people of other cities. If they find their street railway system running \$100,000 or more behind every year they are going to protest and grow dissatisfied. While I am connected with the Calgary street railway I do not intend to have it taken over by a private corporation because it has not proved a success by civic administration. A private corporation would make a street railway pay, for it would cut off the dead lines and operate only those that warranted. It may be possible that we will cut off the dead lines in Calgary before the year is out, and if this is not sufficient to protect against a deficit we may increase the fares, the same as was done in Edmonton. But I do not intend that this shall be undertaken when it is too late. When the soldiers go away on Oct. 1, I am sure there will be a great falling off in revenue to the street railway. Then is not the time to act along lines of drastic economy. It is good business to begin economy now and lay by what store we can for the lean seasons. It might be that I am taking an unpopular stand, but it is the stand I intend to stay by if I am expected to administer the street railway department with business judgment. I am not going to allow capitalists or private corporations to take this public utility because of the protests of people who do not thoroughly realize the state of affairs."

Practicability of One-Man Cars.

D. R. Locher, Vice President and General Manager, Corpus Christi Ry. & Light Co., Corpus Christi, Texas, says:—"Experience in the cost of operating one-man cars has been interesting. Five cars were formerly operated, each equipped with two 35 h.p. motors. These cars made 737 car miles daily and used an average of 1,336 k.w.h. of current. Ten cars are now being operated, which make 1,365 car miles a day and use an average of 1,708 k.w.h. of current daily. Eight of these cars are equipped with 17½ h.p. motors and 2 of them with 35 h.p. motors, and in addition a work car was in use on construction work. However, charging all current to the passenger cars, we were able to operate 84% more car mileage with only 27% more power.

"The total result of the three months that these cars with small motors have been operated has been to increase the car mileage 84%, to decrease per car mile earnings 15%, and decrease the operating expense 37% per car mile. The car mileage has not been increased 100%, because 1,600 feet of track on one line has been torn up for the past six months. This fact, together with the increased wages paid the car men, the extra power required and the wages of one extra car cleaner, is the reason that the expenses per car mile have not decreased 50%. The cost of lubrication at journal boxes for

the five cars which were in service for Jan., Feb., and Mar., 1915, was \$45.08. The cost for the same months in 1916, but running twice as many cars and 84% more mileage, was only \$9.31. However, most of this is due to a different method of lubrication adopted on the new cars, and not to any virtue of the new one-man cars."

Preparation for Hydro Electric Railway Construction in Ontario.

T. J. Hannigan, Secretary, Hydro Electric Railway Association of Ontario, had an interview with the Premier and some other members of the Ontario Government recently, in reference to going on with the work in connection with the construction of hydro electric railways. No official statement regarding the interview has been issued, Mr. Hannigan has not responded to a request for one, and his remarks in regard to the matter have been reported in various ways. One report credits him with saying as follows: "The legislation in regard to hydro radials has been criticized on the score that it prevents us from going ahead with any work during the war. That is not the case. I have the assurance of Mr. Hearst that subject to the approval of the Lieutenant Governor in Council—which is, of course, required for all our enterprises—we can go ahead with preliminary work. That means we can complete our final surveys and plans, take options on land for right of way or purchase lands where it can be done to advantage. The Prime Minister pointed out to me that the municipalities would not want to go ahead with actual construction, but that there was nothing in the act to prevent us getting ready."

Six Day Week for Electric Railway Employees.

At the British Columbia Legislature's last session the following section was added to the British Columbia Railway Act:

"186A. (1) The Lieutenant Governor in Council may make regulations limiting the number of days in a week during which employes or any class of employes of a street railway company may be required or permitted to work.

"(2) The power conferred by the next preceding subsection may be exercised notwithstanding the provisions of any agreement respecting hours of labor between a municipal corporation and a street railway company or a street railway company and its employes.

"(3) Every street railway company contravening or committing a breach of any provision of the regulations made under the authority of subsection (1) shall be liable, upon summary conviction, to the penalty provided in section 287."

It is not expected that any regulations will be made by the Government, for the present at least, as an arrangement has been made by the company with its employes that renders Government regulations unnecessary. The company has drawn up new running schedules, which provide for motormen and conductors having one day off work in every eight days, but the company may suspend this rule on holidays, or other occasions when exceptional traffic prevails, requiring the services of all or part of the men who might be due to take a holiday on such day. The company's car barn men and other employes already work only a 5½ or 6 day week.

Jitney Traffic Notes.

Winnipeg city authorities are taking proceedings against every person who is operating a jitney without a license. A large number have been fined during the past month.

According to a statement made by an officer of the Transcona, Man., Town Council, more than \$4,000 a month is paid as fares to the railway companies and to jitney owners for carrying workmen between Winnipeg and Transcona.

A Toronto observer on a recent afternoon walked the entire length of Yonge St., from the C.P.R. North Toronto Station to Front St., during the time when the street was crowded with people, and the street cars well filled with passengers, and saw only two jitney cars in operation.

G. L. Warren, Secretary, Victoria, B.C., Jitney Association, is reported to have said June 29: "The motor traffic bylaw passed by the Esquimalt Council, has absolutely killed the jitney business in that district and there is no possibility of it being revived." The bylaw calls for the filing of a \$5,000 bond for every car used.

The Winnipeg Jitney Owners' and Drivers' Protective Association at a recent meeting discussed what were described as "the absurd bylaws framed to handicap the jitney men." A committee was appointed to engage legal aid to protect members' interests, and a deputation was appointed to wait on the city council to ask for the repeal of sections of the bylaws affecting jitney traffic which were claimed to be "oppressive and useless so far as safeguarding the interests of the travelling public are concerned." The association has over 100 members.

By Mr. Justice Gregory's decision in a British Columbia court the Vancouver City Council's resolution, by which the city license inspector was instructed to accept from jitney owners only bonds of insurance or casualty companies which have Dominion licenses, was quashed. The judge held that the resolution was passed upon an erroneous statement of the law of deposit required; and that the Legislature never intended that the council could create a monopoly or arbitrarily exclude from the position of bondsmen any person or class. The resolution had the effect of excluding one company from becoming bondsmen for the jitney owners, while the evidence showed that bonds of another company which had not a charter right to issue such bonds, were accepted.

Track Auto vs. Jitney.—The jitney of Santa Clara County, Cal., will suffer a hard blow if F. W. Chapin, General Manager, Peninsular Ry. of San Jose, puts into service his invention of an automobile on steel wheels which can be run on the tracks of the electric railway at a cost much less than that of a street car. A trial trip was made over the streets of San Jose and over the mountain route and proved highly successful. Sixteen miles on a grade were operated and only a pint and a half of gasoline and a pint of oil were used and it is thought that the total operating cost will be half of what is required to operate a street car the same distance. It is planned to install these cars which will carry from 15 to 20 passengers; no poles or trolley wires will be required, just the track, as the regular street car wheels are mounted on the automobile.

Electric Railway Projects, Construction, Betterments, Etc.

The Lake Erie and Northern Ry., pending the completion of and electrification of the line into Port Dover, Ont., has been running a steam service between Simcoe and Port Dover, to take care of the holiday traffic. On July 22 the company commenced running through electric cars from Galt to Port Dover, giving a 2 hourly service. At present the cars run only to Main St., Port Dover, but it is said the line will be complete to the lakeside in a few weeks.

In connection with the opening of the line, the development of the lake carrying trade at Port Dover is under consideration. A deputation representing the company, and residents of the district, waited on the Minister of Public Works at Ottawa, July 4, and urged the construction of piers and the doing of certain dredging at the harbor. The plans prepared some time ago for the port showed works estimated to cost \$250,000, for the commencement of which a vote of \$50,000 is available. Surveys are reported to have been made to do some temporary work the nature of which was not stated. It is said that the L. E. & N. Ry. proposes, if the necessary facilities are provided, to operate a ferry steamer between Port Dover and some U. S. port.

London & Port Stanley Ry.—The new station in London, Ont., situated just south of the G.T.R. station was opened June 29. A new ticket office has been erected, and a shelter, capable of accommodating a large number at the station platform has also been provided. The right of way of the L. & P. S. on the property adjoining the G.T.R. is protected by a long ornamental picket fence, passengers thus being afforded protection from incautious trips over the steam line tracks. Tickets for the L. & P. S. are also to be sold through the G.T.R. station ticket office and L. & P. S. passengers are entitled to the accommodation afforded at the G.T.R.. The passage way between the station and the electric line and that of the steam road is guarded by a gate, operated by the signal man in the tower at Richmond St. Another entrance to the city station is provided at Richmond St., immediately south of the G.T.R.

After the opening of the station a special train carried Sir Adam Beck and other members of the London Railway Commission, members of the city council and others to Port Stanley where the rearranged park and new lighting system were declared available for the public by Lady Beck. The Commissioners on July 11 decided to erect a band stand in the park, and a boathouse on the beach at Port Stanley. (July, pg. 295.)

Moncton Tramway, Electricity & Gas Co.—The hitch between the company and Moncton, N.B., city council, with respect to the paving of Main St., was settled at a meeting of the Board of Works, July 7, and the work will be gone on with at once. (July, pg. 295.)

The Montreal & Southern Counties Ry. is going to erect a car barn at Granby, Que.

The car barn and substation which the company is building at Granby, Que., will have a total length of 230 ft., and a maximum width of 62 ft. It will be of concrete, steel and brick construction, with storage capacity for 6 cars. One of the two tracks in the car barn section will be provided with a pit so that all necessary repair work can be carried on. The only

part of the structure which is completed is the substation which is approximately 40 ft. square. Adjoining this will be provided an office and locker room to complete the full width of 62 ft. Adjoining the car barn will be a boiler room and storage for coal. It is expected to start construction on the remainder of the building early in August, and to have it completed before winter.

The Montreal Harbor Commissioners have, we are officially advised, decided to postpone for the present the carrying out of the plans for the electrification of the harbor railway lines, on the ground that it can be held over for some time without any inconvenience being caused.

Port Arthur Electric Ry.—It is reported that considerable repair work has been completed on the North Belt line, Port Arthur, Ont. (May, pg. 200).

Quebec Ry., Light & Power Co.—A new agreement between the city and the company was approved of at a special meeting of the city council committee June 28. The matters affecting the electric car service settled by the agreement, provided for:—The granting of transfer privileges on the Sillery line as far as the city limits at Levis Ave.; to extend the car lines on St. Valier St. to St. Charles Cemetery by Dec. 31, and the connecting line along a route set out on an accompanying plan to Levis Ave. by Sept., 1918; to extend the line in Limoliou Ward on 3rd Ave., by Beauport Road to the city limits by Dec. 31, 1917; to extend other city lines by Dec. 31, 1916; to build a line on 8th Ave. to connect the present line with Beauport Road, and a line in 1st Ave. from Lamontagne Ave. to 4th St. by Dec. 31, 1917; the agreement provides a penalty of \$25 a day for default as to these matters; the total penalty not to exceed \$10,000. Another section provides that subject to the permission of the Railways Department, the company will extend its line on Champlain St.

These questions were also before the Quebec Public Utilities Commission, and the Board of Railway Commissioners, a joint session being held June 26. After hearing evidence it was decided to wait for the result of the negotiations between the city and the company before making any orders.

We are officially advised that the following new extensions are to be built:—St. Malo Ward, on St. Valier St. (C.P.R. crossing) to the west end of the St. Charles Cemetery, about half a mile. Limoliou Ward, on 3rd Ave. from the intersection of 6th St. with 3rd Ave., up to 16th St., passing through 16th St. up to 4th Ave., going east, and through 4th Ave. to the Abattoir Co.'s buildings; also on 18th St. from 3rd Ave to 1st Ave., to connect at this point with the existing line upon Lamontagne Ave. The total length of these extensions is one mile. (July, pg. 295.)

Saskatoon Municipal Ry.—A press report states that the council proposes to lay about 1,200 ft. of new double track line, in the city, at an estimated cost of \$8,000. This probably refers to the laying of the tracks across the new traffic bridge being built by the province on 25th St. Respecting this work a local paper said recently: "Before the paving of the bridge can be commenced it will be necessary for the city to carry out the work of laying the metals for the street railway across the bridge and also the standards

for carrying the lines for light and power. For this work the city is purchasing the metal from the City of Regina, otherwise some considerable delay would be caused as it would not be possible to obtain the steel from the manufacturers before September. It is estimated that the cost of laying the street railway across the bridge will be about \$9,000. Financial conditions will prevent the city from making the connection with the Second Ave. and University lines for some time. The estimated cost of this work is about \$16,000. Provision has been made underneath the roadway of the bridge for the carrying across of the sewer and water mains, but this, for similar reasons, will have to be delayed for some time." (Sept. 1915, pg. 359.)

The Sarnia St. Ry. Co. signed an agreement, July 7, to take power for the operation of its railway from the Hydro Electric Power Commission. The company will use 500 h.p., so as to have sufficient power for the proposed extensions of its lines to the southern part of the city. (Jan., pg. 30.)

Toronto Civic Ry.—The construction of the new eastern entrance to the Exhibition grounds is being rapidly gone on with and Works Commissioner Harris stated recently that the work would be completed by Aug. 26. The grading to the new bridge across the railway tracks at Bathurst St., is well forward, and gangs of men are at work on Strachan Ave., and at other points. Grading for the right of way for the street railway has been completed as far west as Strachan Ave., and some portions of it have already been ballasted. The joining of the steel bridge which is being erected by the G.T.R., and the wooden structure along the ramps at Bathurst St. require a difficult piece of trestle work, and the concrete footing for this has already gone in. The grading for the approach to the bridge at the Bathurst St. end requires a large amount of filling, the material for which has been secured from the excavations for the footings. The grading operations extend 350 ft. north on Bathurst Street and a considerable distance east on Front St. At the exhibition grounds, where a turning loop is to be provided, the old roller coaster is being taken down to make way for the loading and unloading stations. The coaster will be built on the present site of the chutes. A large portion of the grading is being done by the G.T.R. The street railway line will be operated by the Toronto Ry. (July, pg. 295.)

Transcona, Man.—The proposal to build a line between Transcona and Winnipeg is being revived. It was reported July 6, that New York people were in negotiation with Transcona Town Council. The suggestion is that \$100,000 be expended on construction during this year. The town officers estimate that \$4,000 a month is expended on jitneys and work trains between Transcona and Winnipeg, a large proportion of which would be expended on electric railway fares, provided there was a line. An engineer has gone over the route for a line from the centre of the town to a junction with the Winnipeg Electric Ry. lines. The length of line proposed to be built is 3.25 miles. (Oct., 1915, pg. 404.)

Winnipeg Electric Ry.—The Winnipeg City Council has approved of the laying of a temporary line on Talbot St.

The company is opposing the city coun-

cil's proposal for laying of a belt line from Selkirk Ave. to Logan Ave., via the McPhillip's St. subway, and also a line on McGregor St., between Selkirk and Dufferin St., on the ground that the traffic would be too light to justify the capital outlay. (July, pg. 295.)

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry., and allied companies.—

	July 1, 1915 to May 31, 1916	July 1, 1914 to May 31, 1915
Gross.....	\$ 542,353	\$512,526
Expenses.....	479,523	488,854
Net.....	62,830	23,714

Cape Breton Electric Co.—

	May 1916	May 1915	May 31, 1916	May 31, 1915
Gross.....	\$30,278.31	\$29,611.66	\$148,837.99	\$127,775.12
Expenses.....	20,035.76	16,410.80	96,040.08	80,255.15
Net.....	10,242.55	10,200.86	52,797.91	48,509.97

Levis County Ry.—A copy of a trust deed in favor of the National Trust Co., dated June 12, was filed with the Provincial Secretary, Quebec, July 10.

London & Port Stanley Ry.—The first year's operation of the L. & P. S. Ry. as an electric line was completed June 30. Speaking at the opening of the new station at Port Stanley, June 30, Sir Adam Beck, Chairman London Railway Commission, said that operation of the line had been successful; the revenues being sufficient to meet operating expenses and fixed charges, and to leave a surplus. The figures for the year's operation have not yet been made public, and no reference was made to any estimated profit at the meeting of the Commission held July 11.

Port Arthur Electric Ry.—

	May	April
Total earnings.....	\$8,163.30	\$7,334.31
Car mileage.....	50,456	44,260
Passengers carried.....	189,665	166,476

Toronto Ry., Toronto & York Radial Ry., and allied companies.—

	May 1916	May 1915	May 31, 1916	May 31, 1915
Gross.....	\$903,924	\$795,262	\$4,450,708	\$4,022,505
Expenses.....	446,050	420,459	2,299,125	2,152,304
Net.....	457,874	374,803	2,151,583	1,870,201

Winnipeg Electric Ry.—

	May 1916	May 1915	May 31, 1916	May 31, 1915
Gross.....	\$276,980	\$263,302	\$1,446,788	\$1,496,707
Expenses.....	173,703	176,552	903,851	959,708
Net.....	103,277	86,750	542,937	536,999

Mainly About Electric Railway People.

Mrs. R. R. Knox, wife of the Traffic Superintendent, Winnipeg Electric Ry., died on July 10.

E. J. Burdick, heretofore Superintendent of Power and Overhead, Detroit United Ry., Detroit, Mich., has been appointed Assistant Manager.

James D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Ry., spent a portion of July at the Gatineau Fish & Game Club, Gracefield, Que.

A. S. Davis has been appointed City Passenger Agent, Niagara, St. Catharines, and Toronto Ry., for the summer season, at Niagara Falls, N.Y.

Lt. Col. Fearman, Chief Accountant, Dominion Power & Transmission Co., is in command of the 120th Battalion (Hamilton) which was ordered to remove eastward from Niagara Camp recently.

C. J. Yorath, City Commissioner of Saskatoon, Sask., spoke on civic government, at the Saskatchewan Union of Municipalities' annual conference at Swift Current, June 30.

W. K. George, Toronto, President, London & Lake Erie Ry. & Transportation Co., and one of the Dominion Government directors of the Canadian Northern Ry., left Toronto in July for England for a short visit.



Martin N. Todd,
General Manager, Lake Erie & Northern Railway.



Lieutenant-Colonel G. C. Royce,
General Manager, Toronto Suburban Railway.

D. M. McIntyre, K.C., and A Ingram, of the Ontario Railway and Municipal Board, visited Detroit, Mich., during July, to study the arrangements for dealing with interurban cars, as well as city cars, on the streets.

G. H. Rapsey, who is one of the Port Arthur, Ont., Public Utility Commissioners and who has been acting as Secretary

of the commission since V. Shipway resigned, is to devote a larger portion of his time to the work and will be given a salary.

W. H. Radford, son of W. J. Radford, Assistant Manager, Toronto Suburban Railway, who was a corporal in the London Rifle Brigade, was killed in action at the front July 1, while helping a wounded soldier. Before enlisting he was in the oil department of Pearson & Co., contractors, etc., London, Eng.

Mrs. N. C. Pilcher, widow of the late Major Pilcher, of the 5th Mounted Rifles, and General Manager, Sherbrooke Ry. & Power Co., who fell at Ypres, and her little son have returned from England, where they were to have met Major Pilcher when he went to England on furlough. She is now at her home in Sherbrooke, Que. She received the news of her husband's death a few hours before the time she expected to meet him.

Lt. Col. Geo. Cooper Royce, Secretary-Treasurer and General Manager, Toronto Suburban Ry., who has been in the company's service since Oct. 1, 1901, has been a commissioned officer in the Queen's Own Rifles, Toronto, since Aug. 21, 1893. He was appointed a lieutenant colonel Sept. 27, 1915, and was officer commanding the alien prisoners internment camp at Kapuskasing, Ont., from Jan. 12 to July 20, 1916, when he left to command the additional battalion which is being raised in connection with the Queen's Own Rifles for overseas service.

John W. Moyes, who has been "absent" from Canada for many months, owing it is alleged, to his connection with the Ontario West Shore Ry. fiasco, applied to the Toronto City Council recently for several hundred dollars balance claimed to be due for services rendered in valuing the Toronto Ry. Co.'s property when the city was endeavoring to buy it. Subsequently an application was made at Osgoode Hall on behalf of M. G. Cameron, Goderich, Ont., a judgment creditor for \$126,000, due to shareholders in O.W.S.R., for an order that any money due to Moyes be paid into court, and this was granted.

Martin N. Todd, General Manager, Lake Erie & Northern Ry., which is now practically completed from Galt to Port Dover, Ont., was educated at Dr. Tassie's school, Galt, Ont., and in 1875 entered railway service with the New York Central Rd., and served in the freight department for two years, after which he was appointed town ticket agent for the Great Western Ry., and agent, American Express Co., Galt, Ont. On the absorption of the G.W.R. by the Grand Trunk Ry., he was appointed town ticket agent, G.T.R., and subsequently joined his father in the milling business, and assisted him during the promotion and construction of the Galt, Preston & Hespeler St. Ry., and after his father's death in 1899 he was appointed President and General Manager. In 1898 he was also appointed General Manager, Lake Erie & Northern Ry.

The Montreal Tramways Co's Franchise.

Mr. Justice McLennan on June 28, ordered the issue of a permanent injunction against the City of Montreal, forbidding it to consider proposals for the renewal of franchises submitted in the past, and ordering the city to pay the cost. This finally settles the question which has been before the courts during the past 12 months, and puts the city in a position to

begin negotiations with the company over again.

Following that decision a letter from E. A. Robert, President, Montreal Tramways Co., was submitted to the Montreal Board of Control, July 14. A press dispatch says this letter stated that in return for a 30 year franchise, and the right to carry mails and freight, the company would surrender all existing franchises; give a uniform fare of 5c, except during certain hours when workmen's tickets will be available; and pay the city \$200,000 a year for 5 years, \$300,000 a year for the next 5 years, \$400,000 a

year for the third 5 years, and \$500,000 a year for the rest of the term. Reports of the discussion in the Board of Control say that the Mayor stated that the suggested agreement was not acceptable without modifications. The matters to which objections are taken include the absence of mention of transfers, and of the sale of 6 tickets for 25c; the amounts to be paid the city by the company; and the fact that a 30 year franchise is asked for. The Board decided to make a study of the proposed agreement, and to have reports from the city officers before discussing the matter in detail.

Canadian Electric Railway Association's Annual Meeting.

The annual meeting held at the Royal Canadian Yacht Club, Toronto, July 26 and 27, was well attended by officials of member companies throughout the Dominion and was very successful in every way. The chair was occupied by the President, James D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Railway.

The Niagara Falls Park & River Railway and the Three Rivers Traction Co. were admitted to membership by unanimous vote.

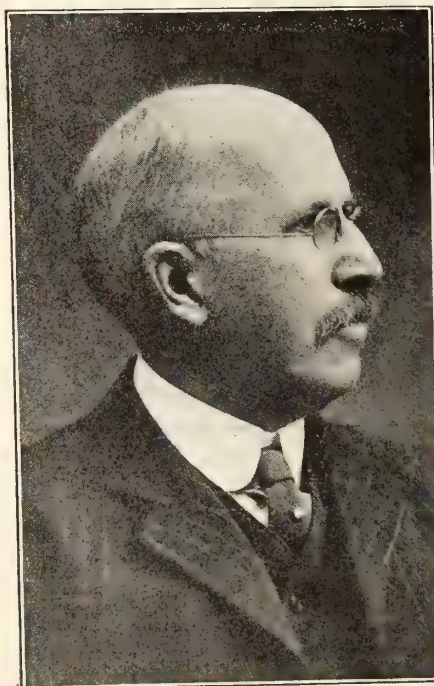
The Honorary Secretary-Treasurer, Acton Burrows, Managing Director, Canadian Railway and Marine World, presented a very comprehensive report dealing with the Association's work during the past year and covering a wide range of other subjects, including the following: Membership, information for member companies, information for non member companies, representation at American Electric Railway Association's convention, transportation of postmen, standard specifications for steel rails, contributory negligence in accident cases, lavatory arrangements on interurban cars and at stations, trolley wires at crossings of railways and protection by trolley guards, regulation of vehicle traffic for protection of electric car traffic, platforms on interurban railways, coasting, experience with rotary converters and motor generator sets, inspection of trolley wires, electrolysis and system of track bonding, car mileage records, lubricating oil contracts, cost of lubricating cars and motors, wages of employees, staff of employees sufficient to meet requirements of traffic, conductors and motormen running the same cars all the time, school children's tickets, workmen's tickets, financial statement.

A report from a special committee on the standardization of steel rails for electric railways prepared by its chairman, W. F. Graves, Chief Engineer, Montreal Tramways Co., was discussed and finally adopted.

The following papers were read and discussed: Traffic conditions in Vancouver and their relation to street car traffic, by W. G. Murrin, General Superintendent, British Columbia Electric Ry. Gearing and gear ratio for railway motors, by W. G. Gordon, Transportation Engineer, Canadian General Electric Co.; Dispensing with juries in damage actions against railways, by F. B. Griffith, Superintendent, Interurban Railway Division & Claims Agent, Dominion Power & Transmission Co.; Problems confronting electric railway officials, by F. S. Livingston, Traffic Manager, Toronto & York Radial Railway. The above mentioned papers are copyrighted by the Association

and will be printed in its annual proceedings and distributed to officials of member companies.

On both days of the meeting the representatives attending took luncheon at the Royal Canadian Yacht Club, the



James D. Fraser,
Director and Secretary-Treasurer, Ottawa Electric
Railway,
who presided at the Canadian Electric Railway
Association's Annual Meeting.

charming situation and surroundings of which were much enjoyed, and made it an ideal meeting place under the hot weather conditions prevailing.

After the adjournment of the afternoon session of the first day of the meeting the representatives attending were entertained by the Toronto & York Radial Ry. and the Toronto Suburban Ry. They were met at the R.C.Y.C. city wharf by C. L. Wilson, Assistant Manager, and F. S. Livingston, Traffic Manager, representing the Toronto & York Radial Ry., and by R. Gilbert, Purchasing Agent, representing the Toronto Suburban Ry., and were motored to the Lambton Golf Club, where they dined, and then returned to the city and attended a performance at the Royal Alexandra Theatre.

The list of officers elected for the current year will be found on another page in this issue.

Electric Railway Notes.

The Montreal Board of Control on July 3, decided to recommend the city council to pass a bylaw legalizing the carrying of freight over the city streets by the Montreal Tramways Co., subject to adequate restrictions.

The London Railway Commission has decided to protest against the business tax proposed to be levied by the London City Council on the ground that the commission is really only a lessee of the London & Port Stanley Ry.

A tentative agreement between the London Street Ry. and the London City Council respecting the operation of Sunday cars was reached July 15. The terms of the settlement wait final approval of the city solicitor and city council.

The Calgary, Alta., Municipal Ry. has started the operation of one man cars on the "blue line." This is one of the lines which does not meet the cost of operation, and this is an experiment in order to reduce the cost, while continuing to give a fair service.

The Brantford Railway Commission decided July 18, that the heads of departments will carry on the management of the street railway and other electric utilities pending the appointment of a successor to L. G. Ireland, who resigned to enter Hydro Electric Power Commission of Ontario service.

The London and Lake Erie Ry. and Transportation Co. has put in operation a reduced fare from London to Port Stanley and return, making the fare every day 30c, with half fare for children. The London & Port Stanley Ry. reduced its fare between the same points early in the year to 40c with a 25c rate for children every day in the week except Wednesdays and Saturdays, when a 30c rate was in operation on the lines.

The British Columbia Electric Ry. has put in operation on its English Bay line, Vancouver, a new type of open observation car which was altered from an old type at the company's shops at a cost of about \$500. All the superstructure practically has been removed and the seats have been rearranged so that the car will now seat 53 persons. One new feature is the centre entrance. The gates are of glass and are operated by levers by the conductor. The back half of the car is available for smokers and the front portion may then be used by women and children. The removal of the vestibule at the front and rear gives much more room than in an ordinary car as well as fine positions for observation as the car passes along. An ingenious arrangement connected with the gate mechanism pushes the steps out to meet the passenger. When the gates are shut and the car is travelling the steps are folded up under the car. The car is an experiment, and if it is favorably received by the public others will be built and used during the summer.

The Toronto Ry. and the Avenue Road Subway. The City of Toronto's legal department received a cable from England recently to the effect that the Privy Council had dismissed the appeal of the Toronto Ry. against the order of the Board of Railway Commissioners, assessing it for a portion of the cost of building the subway across Avenue Road. The Toronto Ry. claimed that the Board had no jurisdiction in the matter so far as the T.R. is concerned, and also that the city is obliged, according to its agreement with the company, to provide right of way for the company's tracks.

Marine Department

The Development and Future of Canada's Mercantile Marine.

By A. A. Wright, Managing Director, St. Lawrence and Chicago Steam Navigation Company.

Whenever I hear freight rates being discussed I wonder how many people realize the wonderful cheapness of present day water transportation as compared with the cost of it when men who are now middle-aged were boys. It is a curious fact that the cost per bushel of capacity was, up to the time of the outbreak of war, exactly the same for modern steel vessels as it was for the early wooden vessels that plied on the Great Lakes, namely, approximately \$1 a bushel. For example, in the early seventies, probably the schooner Bermuda, which had a capacity of about 8,000 bush., would be a fair example of the type of bulk freight boat on the Canadian side of the Great Lakes. This vessel cost to build about \$8,000, and was engaged in carrying barley from Toronto to Oswego at from 2½c. to 3c. a bush., bringing coal back from Oswego to Toronto at 60c. a ton, a distance of about 130 miles. It is the same today for the latest type of vessels. Figure out the cargo capacity in bushels of wheat and you have the standard of cost.

But while the cost of vessels per bushel capacity has remained the same, the freight charges have steadily decreased. To get an idea of the great advance which has been made in cheapening transportation by the enterprise of Canadian vessel owners it is only necessary to contrast the rates paid on long distance freight in the seventies. The present rates are 30c. a ton on coal, Cleveland or Buffalo to Fort William and Duluth, 700 to 1,000 miles, and 7c. a bush. on wheat from Fort William to Montreal, 1,273 miles. The records supply plenty of material for contrast. For instance, about 1872 the steamer Canada, owned by the late Capt. J. B. Fairgrieve, of Hamilton, with a capacity of about 14,000 bush. wheat through the Welland Canal, received 30c. a bushel on a cargo of wheat from Chicago to Montreal. About the same time the schooners Annie Mulvey and White Oak received 27c. a bushel on wheat from Chicago to Kingston.

Again, in 1877, the schooner Twilight, with a capacity of from 400 to 450 tons, received \$2.10 a ton from the Consumers' Gas Company for carrying coal from Cleveland to Toronto; the average current rate at that time being from \$1.90 to \$2 per ton; and, even at these apparently extraordinary rates to us, none of the men operating them became wealthy out of the operation of vessels.

On the completion of the present Welland Canal, allowing boats of about 256 to 260 ft. long by from 40 to 43 ft. beam to operate between Lake Ontario and the Upper Lakes, a marked change took place in the class of vessel and in the current rates. Thus, in 1888, the Canadian fleets were strengthened by the steel steamships Rosedale and Algonquin. These were built in Great Britain, the former at Sunderland and the latter at Yoker, near Glasgow, and were brought out and put in commission between Fort William, Georgian Bay, Kingston and Buffalo. The Rosedale was the first steamship to carry a cargo through from London, Eng., to Chicago. This cargo consisted of 5,000 barrels of cement. The Rosedale was built to the full size at that time of the St. Lawrence Canals, which

were not as large as the new Welland Canal, and her first cargo of wheat from Fort William to Kingston was 37,500 bush. The Algonquin was brought up through the St. Lawrence Canals in two parts and joined together, and had a capacity of 70,000 bush. wheat through the Welland Canal and 95,000 bush. on Upper Lake draught. The Rosedale was afterwards lengthened by the addition of 72 ft., when she carried about 67,000 bush. through the canals and about 80,000 bush. on Upper Lake draught. In connection these two vessels, it may be interesting to note that the Rosedale, 28 years after she came out, loaded a cargo of deals in the St. Lawrence for a British port, and the Algonquin is now being fitted out to go back to salt water.

After the Rosedale and Algonquin very little increase in Canadian tonnage took place until about 1899, when the Turrets and the package freighters Ames, Pellatt and Plummer were brought out and put in the trade between Montreal and Fort William. At this date the entire Canadian fleet of steel steamships, including the C.P.R. freight and passengers steamers Manitoba, Athabasca and Alberta, only had a carrying capacity of about 600,000 bush. wheat per trip. From 1899 forward, however, the fleet grew very rapidly until before the present war, when a very large number of the full Welland Canal sized steamers, which could get out to sea, were sent out to salt water to help out the shortage of vessels on the ocean. The capacity has grown to approximately 10,000,000 bush. of wheat per trip, consisting of vessels with a carrying capacity of from 70,000 bush. each, of the smaller Welland Canal sized boats, to steamships like the Midland Prince, Emperor, E. B. Osler, J. H. G. Hagarty, and W. Grant Morden, each with a capacity per trip of from 310,000 to 465,000 bush. of wheat, or from 9,000 to 13,000 tons of coal each trip. This remarkable development of Canadian shipping on the Great Lakes has been brought about entirely by the enterprise of private individuals and companies taking advantage of the deeper and larger channels provided by the Canadian and United States Governments. The vessel capacity for moving coarse bulk freight like coal, grain and ore has more than kept ahead of the development of the country at large.

A great deal of misapprehension exists in the public mind, and apparently in the minds of some of our legislators, regarding water transportation, and resolutions have been brought before Parliament in recent years, suggesting regulating freight rates on the lakes and putting bulk freight boats under the Board of Railway Commissioners. These men apparently fail to grasp the fact that the lakes are free to anyone who cares to build or buy and operate a steamship, and that it is impossible for any man, or body of men, to control transportation rates on the Great Lakes, so long as this freedom exists. The records show clearly that whenever exceptional conditions have arisen—and they are always cropping up every few years—whereby a larger quantity of bulk freight is offering than in normal times and rates advance, this has

been followed by an increase in tonnage, with the consequence that rates immediately drop, and probably for a year or more vessels will be carrying bulk freight at cost and often at considerable loss, and then return to fair rates as business increases.

The history of water transportation from the beginning of the world shows that free competition among individuals not only keeps rates down so that coarse, low priced products can be moved long distances cheaply, but the keenness of this competition has led to such an improvement in the size and class of ships that the tendency up to date has been steadily towards lower rates, and this, in spite of the fact that the cost of operation of vessels has been increasing annually, while the initial first cost of a vessel, according to her carrying capacity has remained comparatively stationary. The cost of operating has advanced in the last 10 years approximately 40%, and, in spite of this fact, rates by water have been reduced on the Great Lakes to the lowest point anywhere in the world. In round figures, where boats get reasonable dispatch, freight is moved on the lakes for approximately one tenth of the cost of moving by rail for the same distance.

Some discussion has taken place recently in Parliament regarding the encouragement of shipbuilding in Canada, on the ground that vessels are scarce at present, and it is very unfortunate that from the report in the press the subject did not seem to be very well understood by the men who took part in it, as they seemed to think that the only solution was the starting of shipyards. It is true there is a temporary shortage of ships on the ocean, but really none on the inland waters of Canada. In this connection, it might be interesting to note that owing to the extraordinary demand for iron ore by the smelters adjacent to the Great Lakes, there is a keen demand for vessel capacity at present, yet there is really no shortage of vessels, as is proved by the fact that ships moved through the Sault Canals in May, 1916, 66% more coal and ore and over 180% more wheat and grain than in May, 1915. The actual figures are over 10,000,000 tons of ore and coal, and over 53,000,000 bush. of wheat and other grain in one month. Even if there were twice as many vessels, practically no more could have been moved, for the docks and elevators have been working to their capacity. A mere statement of this fact should convince anyone that it is not only shipyards which are wanted to secure a larger development of Canada's mercantile marine, but encouragement for the men who have the money and ability to manage ships to employ them profitably in carrying Canadian products. One of the first steps needed in this direction is to preserve Canadian trade for Canadian vessels by intelligent coasting laws and the removal of needless restrictions.

Among other things tending to prevent the full development of Canadian shipping are our defective coasting laws. Norwegian and other ships, manned by crews which do not get half the wages which Canadian crews are paid, and which are provisioned for less than half what it

costs to feed a Canadian crew, are allowed coasting privileges in Canada, mainly carrying coal from Nova Scotia to Montreal, making it impossible to operate Canadian vessels in this trade, even if the ships could be purchased or built for less than the cost of the Norwegian ships. Again, United States vessels, whose coastwise trade is preserved to them, can virtually compete with Canadian vessels on equal terms on strictly Canadian business, as our coasting laws only forbid the carrying between two Canadian ports, and there is nothing to prevent them taking Canadian grain, which has been shipped from Winnipeg to Duluth, from Duluth to a Canadian port, whether it is designed for export or local consumption. On the other hand, United States grain, designed for United States consumption, cannot be carried from a United States port to a Canadian port in a Canadian vessel.

As regards ocean shipping and the talking of control of rates and government owned lines to compete with private enterprise, a study of the policy of Great Britain in this respect on the one side and that of the United States on the other well illustrates the two methods of dealing with shipping. In Great Britain the greatest freedom possible is allowed in the operating of their vessels. Practically the only Government interference in normal times is that necessary to see that ships are properly equipped for the safety of human life. The United States, on the contrary, by tariff imposts and absurd restrictions regarding crews—which have reached their climax apparently in the present U. S. Seamen's Bill—has practically put United States sea going shipping off the ocean, leaving them practically nothing but their coastwise shipping on the Atlantic and Pacific coasts and the Great Lakes, while Great Britain controls over two thirds of the foreign-going shipping of the world.

The policy of individual freedom which in the past has built up Canadian vessel capacity on the inland waters would do the same one the ocean, as it is only a question of giving Canadian owners an equal chance with their competitors. I am certain that any change in the way of the Government attempting to control rates, or operating, will kill off both, and leave this country at the mercy of foreign shipping. Under wise fostering plans Canada has, I am convinced, a wonderful future ahead of her on the water. But if we are to do justice to ourselves in this respect, we must largely follow the model which has made the people of Great Britain the greatest maritime nation in the world.—By-Water Magazine.

The gross registered tonnage of a vessel is arrived at by ascertaining the total internal capacity in cubic feet below the upper deck and in all enclosed spaces or deck houses above it, and dividing the result by 100; for example, 1,450,000 cubic feet divided by 100 equals 14,500 tons. At this gross registered tonnage, a vessel would at 19 ft. draught displace 19,650 tons; at 23 ft., 24,500 tons; at 30 ft., 28,550 tons. This is as a general thing, displacement tonnage being a variable quantity, depending on other factors than those mentioned.

It is reported that British shipyards at present have under construction 423 steel merchant vessels of about 1,423,335 tons, apart from handling all the Admiralty requirements. During 1915 there were launched throughout the world 743 merchant vessels with a tonnage of 1,201,638.

Car Ferry Service Between Port Maitland, Ont., and Ashtabula, Ohio.

The Interstate Commerce Association heard recently an application by the Michigan Central Rd., under the provisions of sec. 5 of the act to regulate commerce, as amended by the Panama Canal Act, in connection with the establishment of a car ferry service between Port Maitland, Ont., and Ashtabula, Ohio. It was urged that by reason of the interownership of the stock existing between the several railways involved in the application, which furnish an all rail route between the ports mentioned through which through rates are applicable, it is possible for the petitioner as a party to such through routes to compete with the proposed car ferry line in which it will have an interest within the meaning of the act; and upon the facts of record the proposed service will be in the public interest and of advantage to the convenience and commerce of the people, and will neither exclude, prevent nor reduce competition on the route by water if properly operated.

The Commission in its judgment stated that the Toronto, Hamilton & Buffalo Ry., a subsidiary of the applicant, has purchased a car ferry with capacity for 30 loaded freight cars of 50 tons each, at a cost of \$385,000. This railway is extending its line from Dunnville to Port Maitland, Ont., where slip docks are under construction. This extension of the dock facilities will be completed in July, 1916, and the car ferry will be delivered by its builders at about the same time. It is desired to institute the car ferry service between the T. H. & B. R. and the New York Central Rd., via Port Maitland and Ashtabula. A corporation will be organized under the laws of the State of Ohio, which will take over and operate the car ferry. All the stock of this corporation will be owned or held in the interest of the T.H. & B.R. The M.C.R. holds 17.9% of the T.H. & B.R. stock; 17.9% is held by the Canada Southern Ry. Co. and the petitioner in turn owns 51% of the Canada Southern Ry. stock; 27.1% is held by the New York Central, which also owns approximately 90% of the M.C.R. stock.

The T.H. & B.R. connects with the M.C.R. at Welland, and the latter has a line extending from Welland to Buffalo. The T.H. & B.R. publishes joint through rates from points on its line to destinations on the N.Y.C. via the all rail route indicated. The petitioner, as a party to this through route, participates in the joint rates so published. There is, therefore a possibility of competition established between the interested railways and the boat line which they seek to inaugurate. It appears, however, that the car ferry service proposed will greatly expedite the movement of freight from points adjacent to the south and north banks of Lake Erie and the territory tributary thereto, and relieve by so much the congestion at the Niagara frontier. Under normal conditions it is shown that it takes at least three days to get freight cars through the Buffalo terminals and a further delay is encountered in getting across the International Bridge, which is a one track structure, furnishing the only channel of rail transportation in that locality between the U. S. and Canada, and is, therefore, in great demand for passenger as well as freight traffic. The transportation of freight between the two ports all rail under the most favorable

conditions can only be accomplished in 6 or 7 days, whereas via the proposed car ferry service the maximum time required will be 8 hours. The cost of the service by ferry, it is said, will be less than half the cost by rail. While the ferry will use the N.Y.C.R. docks at Ashtabula, it will not be under exclusive contract with that road and is open to arrangement with any other road at that port desiring to use its across-lake service for the purpose of getting traffic up to Port Maitland. Since this is a new service it could not be said that in its inauguration it would have the effect of excluding, preventing, or reducing competition, but these ends might be accomplished by improper methods of operation. This contingency is within the purview of the act and if such a result should be effected, the attention of the Commission may be directed thereto upon subsequent proceedings.

From a consideration of the facts and circumstances here shown the Commission is of opinion and finds that the proposed specified service by water will be in the interest of the public and of advantage to the convenience and commerce of the people, and that it will neither exclude, prevent, nor reduce competition on the route by water under consideration, if properly operated. The corporation to be organized for the purpose of operating the car ferry service will be expected to file its tariffs stating its charges for the service which it holds itself out to the public to perform. These tariffs should be filed in accordance with the provisions of the act to become effective not less than five days after such filing. It is therefore ordered that the application of the Michigan Central Rd. for authority to institute and operate such car ferry service, is granted, subject to such further orders as may hereafter be entered by the Commission, and that the rates, fares, schedules, and regulations to be applied to the movements of such car ferry service when operated shall be established by Aug. 1, 1916, upon notice to the Commission and to the general public by not less than five days filing and posting in the manner prescribed in sec. 6 of the act to regulate commerce.

English Channel Tunnel. The British Prime Minister was asked recently to grant a day for discussing a resolution to the effect that in the opinion of the House of Commons the progress of the war has demonstrated the great advantages which would have accrued to Great Britain and the allied powers if a railway tunnel beneath the English Channel had been constructed and in operation, and that the time has arrived to support the proposal so that plans may be prepared and powers obtained to proceed with the work as soon as the war is over and the necessary labor available. The chief opposition to the scheme has always come from a certain section of the military, on fears which, throughout the war, have fortunately proved groundless.

A shipping employment registration office will be opened in Toronto shortly under the Dominion Marine Association's auspices. A small building is being erected on the water front for a sailors' institute, similar to those at Port Huron and Kingston, and the office will be located there.

The Loss of the s.s. Stormount Investigated

An investigation into the causes which led to the loss of the Montreal Transportation Co.'s s.s. Stormount at Gull Ledge, Marie Joseph Island, off the Nova Scotia coast, on June 20, was held at Halifax, N.S., June 27, before Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Commander E. Wyatt, R.N.R., and Lieutenant-Commander G. C. Holloway, R.N.R., as nautical assessors. The evidence showed the Stormount left Philadelphia June 15, for Sydney, N.S., where she was to be handed over to the Dominion Coal Co. She was equipped with the necessary navigating instruments. No deviation book was kept, and the master stated that he never looked at the log book nor signed it. He also stated that he met so many fishing boats that he had no time to devote to a more accurate navigation of his vessel, he was going at times half speed to slow, and did not refer to the sailing directions frequently, and did not take any soundings, all distances being guesses. When the vessel struck, there was a dense fog and the helm was put to port and the engines ordered full speed astern. Boats were at once put over, but no soundings were taken, as he claimed it would have been useless and no effort of any kind was made to ascertain if it was possible to extricate the vessel from her position. The master was on deck all the time from leaving Philadelphia. The second mate, who holds an inland waters master's certificate, claimed to have no responsibilities in regard to the navigation of the vessel, and the first officer, who has a mate's certificate for passenger vessels in the coasting trade, stated that he assisted the master in navigating the vessel, but never laid courses, kept a deviation book, nor took observations, but merely steered the courses given him by the master. He could not account for an erasure in the log book, nor did he know what had been written there, and was unaware what orders were given to the engine room after the vessel struck.

The court found that the master ignored ordinary precautions and steered too fine a course without making allow-

ances for the elements which were tending to bring his vessel inshore. The court could not understand how the vessel was brought as far as it was without striking some of the other reefs in the vicinity in a southerly direction. The evidence showed that a "rule of thumb" system prevailed on board, and though the log book showed that some observations were taken to ascertain the errors of the compass, they were not numerous, nor frequent enough for safe navigation. The court commented on the fact that the master only seemed to have assumed the navigation of the vessel and did not insist on his officers making themselves acquainted with the courses, compasses, etc., keeping them on the bridge simply as lookout men, therefore in view of the circumstances, including the fact that the vessel may become a total loss, and the careless manner in which it was navigated, the court suspended the certificate of the master, W. H. Blackler, No. 318, Newfoundland, for the remainder of the year. Regarding the first mate, G. R. Parsons, the court was astonished at his apparent lack of ambition to perfect himself in his profession. The chief officer must bear in mind that in the event of the master becoming ill or disabled he would be called upon to replace him and assume responsibility, but in this case he would be unequal to the task and would establish a danger to property and be detrimental to the reputation of the coast. He was therefore cautioned to waken to his responsibilities if he wishes to meet with any success in his vocation.

The permitted draught of water through the St. Lawrence canals, has, on the Dominion Marine Association's representation been increased to 14 ft. 3 ins. until further notice. As stated in Canadian Railway and Marine World for July, the permitted draught of water through the Welland canal has been increased to 14 ft. 4 ins. on account of the prevalent high water levels.

Lights will not be shown from the gas beacons at Button Islands, Hatton headland, Wales island, Ashe inlet, Charles island, Nottingham island, Digges island, Mansel island, and Coats island, in Hudson Strait and Bay, during the current navigation season.

Water Pollution on the Great Lakes.

At a meeting of the International Joint Waterways Commission at Detroit, Mich., June 26, the Dominion Marine Association was represented by its Counsel, Francis King, M.A., Kingston, Ont., and the Lake Carriers' Association by Wm. Livingstone, President. The hearing was largely devoted to discussion of the plans prepared by Prof. Phelps, the Commission's sanitary expert, for taking care of the sewage of border municipalities, but special consideration was also given to his recommendation that steps should be taken without delay to settle and put in operation some method of preventing pollution by steamboats. Under instructions, and in accordance with statements made on behalf of the Dominion Marine Association at previous sessions the attitude of vessel owners was shown to be one of cheerful willingness to comply with any reasonable requirements enacted by legislation on the advice of the Commission, provided that any device, appliance, or method proposed be first carefully and exhaustively tested in all weather conditions and for all types of boats. It was urged that such experiment is possible at small expense and that as pollution from this source is infinitesimal compared with that from land and as it may take 5 to 10 years to deal satisfactorily with land sewage systems, no undue haste should be permitted in making rules for lake vessels. The Commission apparently intends to proceed in the way suggested. L. C. Frank, Sanitary Engineer, U. S. Public Health Service, Washington, D.C., gave evidence regarding an appliance already experimented upon in the Navy Yard there, and now just installed on the s.s. D. G. Kerr at Cleveland. It consists of a small tank or sewage receptacle, the contents of which are sterilized, and automatically discharged at intervals, by the action of live steam from the ship's boilers. The cost of installation is said to be moderate and the cost of operation quite negligible. He will make several trips on the vessel and the appliance will be tried throughout the season. Similar tests will be made on vessels of other types, and experiments with this and other devices will be continued until one can be safely selected that will provide maximum efficiency at minimum cost.

Saulte Ste. Marie Canals Traffic.

The following commerce passed through the Saulte Ste. Marie Canals during June.

ARTICLES		CANADIAN CANAL	U. S. CANAL	TOTAL
Copper.....	Eastbound	Short tons 700	16,684	17,384
Grain.....	"	Bushels 5,180,888	5,120,526	10,301,414
Building stone.....	"	Short tons		
Flour.....	"	Barrels 364,760	686,606	1,051,366
Iron ore.....	"	Short tons 2,513,492	6,941,174	9,454,666
Pig iron.....	"		5,923	5,923
Lumber.....	"	M. ft. b.m. 2,192	17,659	49,851
Wheat.....	"	Bushels 10,471,326	15,456,845	25,928,171
General merchandise.....	"	Short tons 11,935	19,227	31,162
Passengers.....	"	Number 2,483	2,285	4,768
Coal, hard.....	Westbound	Short tons 27,500	236,877	264,377
Coal, soft.....	"	120,200	1,670,847	1,791,047
Flour.....	"	Barrels	910	910
Grain.....	"	Bushels 3,628	16,525	20,153
Manufactured iron.....	"	Short tons 3,584	2,047	5,631
Iron ore.....	"	Short tons 1,500	103,658	105,158
Salt.....	"	Barrels 48,962	160,011	208,973
General merchandise.....	"	Short tons 2,302	1,754	4,056
Passengers.....	"	Number		
SUMMARY				
Vessel passages.....	Number	1,037	2,647	3,684
Registered tonnage.....	Net	2,229,043	7,777,476	10,006,519
Freight—Eastbound.....	Short tons	2,975,555	7,683,619	10,659,174
Westbound.....		199,424	2,101,871	2,301,295
Total freight.....		3,174,979	9,785,490	12,960,469

The St. John Dry Dock and Shipbuilding Co., the incorporation of which was mentioned in our last issue, will probably, when organized, take over the contract for improvement work in Courtenay Bay, held by the Norton Griffiths Construction Co., and upon which a considerable amount of work has been done. The contract, which was awarded in 1912, provides for a 4,600 ft. breakwater, 9,900 lin. ft. of quay walls, a dreadnought dry dock 1,000 ft. long, and the reclamation of large tracts of land. The value of the contract was estimated at \$13,000,000. Among those interested in the company are Senator W. H. Thorne, G. McAvity, J. E. Moore and W. B. Tennant, St. John, N.B.

Baldry, Yerburch, & Hutchinson, Ltd., has been incorporated under the Ontario Companies Act, with \$561,000 capital and office at St. Catharines, to carry on a general dock, railway and canal contracting business. The parent company is an English one, and was awarded a contract for one of the sections of the Welland Ship Canal, which will be taken over by the new company. G. Peterson, St. Catharines, is the company's attorney.

Atlantic and Pacific Ocean Marine.

Furness Withy & Co. assumed possession of the Dock St. municipal pier at Philadelphia, Pa., July 2, for loading outward cargoes. The company has obtained the pier under a lease at a rental of \$19,000 a year.

Canadian Pacific Ocean Services Ltd., has resumed the Montreal-Bristol steamship service which was operated for several years prior to the war, by the C.P.R. The steamships Hackness, Medora, and Montford as on the route.

The New Zealand Shipping Co., which has been operating a line of steamships from Montreal to New Zealand and Australia, for some time, is reported to have been absorbed by the Peninsular and Oriental Steam Navigation Co., a British concern with connections in various parts of the world. The shares of the New Zealand Shipping Co., with a face value of £10, are being exchanged for P. & O. N. Co.'s £10 deferred shares. The present market values of these stocks are given as £32 and £33 each respectively.

The s.s. Uranium, one of the vessels purchased recently by the Cunard Steamship Co., from Canadian Northern Steamships, Ltd., has had her name changed to Feltrie. She has been thoroughly overhauled and refitted. It is stated that the double bottom has been rebuilt, a new engine and boiler room made, and the whole machinery taken out, repaired, and brought up to date, and the whole of the internal furnishings completely remodelled. The s.s. Principello, another of the Canadian Northern vessels purchased by the Cunard Co., has had her name changed to Folia.

Maritime Provinces and Newfoundland.

A steamship service has been inaugurated between St. John's, Nfld., and St. Pierre, Miquelon and North Sydney, N.S., by the s.s. Pro Patria.

La Cie Francaise des Cables Telegraphiques has deposited with the Public Works Department, Ottawa, plans of a wharf to be built at North Dartmouth, in Halifax Harbor, N.S.

The Reid Newfoundland Co. is operating the steamships Meigle and Sagona, between St. John's, Nfld., and Labrador, this year, on a fortnightly schedule, calling at all the fishing ports between Battle Harbor and Nain. The trip takes from 12 to 15 days.

It is reported that the Newfoundland shipping industries have purchased about 30 sailing vessels of a tonnage from 150 to 200 tons, in the United States. Some of these are being fitted with auxiliary power and will be used chiefly for the fish and coal carrying trade.

The Dominion Government has presented engraved watches to the crew of the United States fishing schooner Josie and Phoebe, for rescuing the crew of the schooner Harry off Cape Sable on May 28, when the sailors had been 72 hours without food and water.

The Newfoundland s.s. Kite is reported to have sailed from St. John's to New York, where she will be dry-docked, overhauled, and refitted for an exploration trip to Baffin's Land, which is being arranged by a party in the United States.

It is reported that a Toronto company is trying to arrange a steamship service between Montreal, Quebec, Nova Scotia, Prince Edward Island, and Newfoundland ports. Vessels with accommodation for

130 first class passengers and 2,000 tons of cargo will, it is said, be used, and guarantees as to cargoes from merchants in the different places are being asked for.

Province of Quebec Marine.

An investigation into the causes of the stranding of the s.s. Arachine on Little Miquelon Island, was opened at Quebec, July 19, by Capt. L. A. Demers, Dominion Wreck Commissioner.

The Public Works Department received tenders to July 20, for dredging the River St. Maurice at Three Rivers, and to July 21, for extensions to wharf at Chandler.

The sluice walls of the waste water weirs of the Lachine Canal collapsed, July 15, causing considerable damage, apart from delaying traffic through the canal.

The Three Rivers council is offering to provide free sites, with exemption from taxation, and other inducements, to shipbuilders who are prepared to erect plants in the city.

An order in council has been passed approving the Montreal Harbor Commissioners' bylaw 96, governing the movement of cars, trains, and locomotives on the Commissioners' tracks.

Press reports state that one of the old shipbuilding yards at St. Laurent, Isle of Orleans, is being prepared for operation, and that keels of two sailing vessels will be laid there shortly.

The Chatham Steamship Co. Ltd., incorporated recently, with office at Quebec, together with five other companies, Colin W. Ltd., Howard W. Ltd., Marian W. Ltd., Richard W. Ltd., and Stuart W. Ltd., each owning one vessel, were organized in the interest of the Canadian Import Co. L. C. Webster is President, W. Q. Stobo, Vice President, and H. C. Thorn, Treasurer, all of Quebec.

Ontario and the Great Lakes.

The name of the s.s. Panther, purchased recently by the Davidson & Smith Elevator Co., registered as owned by J. R. Smith, Port Arthur, has been changed to Staples.

The Toronto Harbor Commissioners have deposited plans of a railway bridge to be built across the River Don, on the roadway under construction through the industrial district.

The name of the steamboat Alert, owned by D. B. McAulay, Southampton, Ont., has been changed to Douglass M. There are on the Canadian register 10 steamboats named Alert.

A press report states that a company has been formed at Owen Sound to operate a passenger steamboat between Owen Sound and Collingwood, calling at Meaford, during the summer.

The s.s. C. W. Hutchinson, which was raised recently after being sunk in collision at Sault Ste. Marie, while being towed to Cleveland, Ohio, July 10, sank in Lake Huron. It is expected that one of the temporary patches gave way and she filled.

The Toronto City Council has authorized the guaranteeing of \$1,500,000 of Toronto Harbor Commission's bonds, additional to the \$5,000,000 already guaranteed. The proceeds will be used on continuing the improvement works already in progress.

Work was commenced early in July on the crib and concrete head wall on the harbor improvement works between John St. and Spadina Ave., Toronto, and also

on the section between Bathurst St. and Spadina Ave. The contractors in the first case are the J. E. Russell Contracting Co., Toronto, and in the second, R. Weddell Co., Trenton, Ont.

The Montreal Transportation Co.'s barges Burma and Quebec, which went ashore in the Rapide Plat channel near Morrisburg, at the end of June, were released during July, after having had about 28,000 bush. of grain removed.

The schooner Charlie Marshall, owned in Cobourg, was reported to have sprung a leak off Gaspe Head, July 14, and to be in a sinking condition and dangerous to navigation. She had a cargo of coal on board. The vessel was abandoned by the crew.

The s.s. G. R. Crowe, owned formerly by the St. Lawrence and Chicago Steam Navigation Co., Toronto, and acquired recently by A. B. Mackay, Hamilton, Ont., and sold for salt water services in Europe, was cut in two at the end of June to allow her to pass the canals, and was rejoined at Levis, Que., prior to proceeding to England. She was built at Collingwood, Ont., in 1910.

The North Bay & French River Navigation Co., Ltd., which was incorporated recently, with office at North Bay, is operating the s.s. Northern Belle, formerly owned by the Lake Nipissing Shipping and Transportation Co., Sturgeon Falls, Ont. The route is between North Bay and French River. The capital of the company is \$10,000, of which about half has been subscribed. E. L. Banner is President and Managing Director, and H. S. Campbell is Secretary-Treasurer.

Dredging is being carried on in Toronto harbor, and the contractors, Canadian Stewart Co., have been given permission to carry a pipe line across the new western entrance channel, and to maintain it there for the current navigation season, except during August, when the channel is to be kept clear for the heavy tourist traffic. The new western channel will be closed to navigation after Aug. 31, with the exception of such days as weather conditions prevent the use of the eastern channel. In the latter event, the pipe line will be temporarily broken, the harbor master deciding when this is necessary. The line will be kept well lighted at night.

The United States Lake Survey reports the levels of the Great Lakes in feet above mean sea level for June, as follows:—Superior 603.48; Michigan and Huron 580.94; Erie 573.26; Ontario 247.86. Compared with the average June levels for the past ten years, Superior was 1.28 ft. above; Michigan and Huron 0.12 ft. above; Erie 0.41 ft. above, and Ontario 0.96 ft. above. According to investigations of engineers of the Department of Railways and Canals, the June level of Lake Ontario was at the highest point since June, 1870, registering 0.77 ft. below that record. The June level was 0.73 ft. above that of May, and was 2.71 ft. above the June 1915 level.

Elsewhere in this issue is given the judgment of the Interstate Commerce Commission in connection with the operation of a car ferry service to connect the Toronto, Hamilton & Buffalo Ry. at Port Maitland, Ont., with the Michigan Central Rd., at Ashtabula, Ohio. The vessel has been built by the Great Lakes Engineering Works, Detroit, Mich., and has been named Maitland No. 1. She is entirely of steel, and of the latest type of construction for vessels of this type. She is 300 ft. long, with capacity for 2,000 tons (32 cars), and has a loaded draught

of 15 ft. and a speed of 15 miles an hour.

The Port Huron and Duluth Steamship Co., which operates four vessels between Point Edward, Ont., and Duluth, Minn., has changed its name to the North-Western Steamship Co., and it is announced that additional vessels will be placed on the route.

Manitoba, Saskatchewan and Alberta.

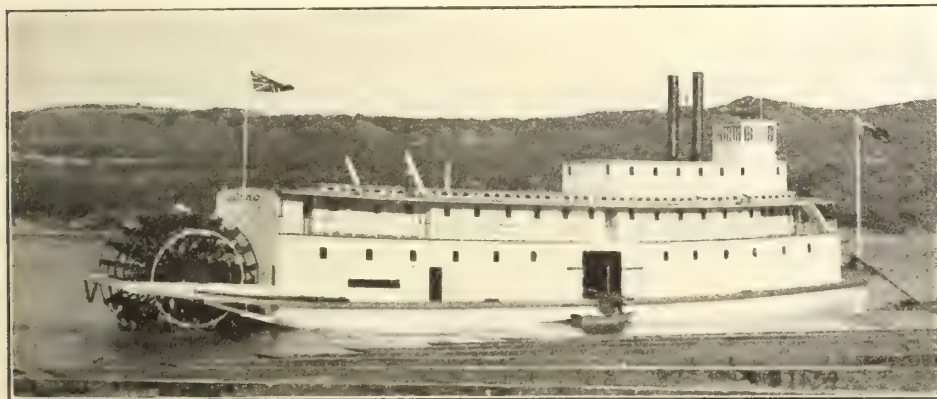
The Hudson's Bay Co. is operating steamboats between Peace River Crossing and Hudson Hope, and between Port Vermilion and Vermilion Chutes. It also runs the s.s. Fort McMurray between Peace River Crossing and the Chutes and Smith's Landing, and between Smith's Landing and McMurray. These vessels are not run on a regular schedule, but leave whenever sufficient cargo has been secured.

The Peace River Tramway and Navigation Co.'s s.s. D. A. Thomas, an illustration of which is given on this page, completed her first trip of 660 miles from Peace River Crossing to Vermilion Chutes and return, towards the end of June, the trip occupying 3 days and 9 hours, including all stops and the reload-

that they will leave Prince Rupert on Wednesdays at 12 noon and arrive at Skagway on Friday mornings to connect with the White Pass and Yukon Ry. trains leaving there at 9.30 a.m. They will then leave Skagway on the arrival of the W. P. & Y. R. trains on Saturdays at 7 p.m. It is also the intention to make the trip to Taku Glacier, either up or down, at the discretion of the captain, according to the available time.

The British Columbia Merchant Marine, which was incorporated recently under the British Columbia Companies Act, to promote the building and operating of steam and other vessels within, and from the province, is not to proceed with its organization. We are advised that as the B.C. Government has provided for the encouragement of shipbuilding and operation in a recent act, and a number of private concerns have already taken advantage of its terms, the objects for which the association was formed have been accomplished, and the directors decided that it was not necessary to proceed further.

An investigation into the causes of the stranding of the Harrison Line s.s. Barrister in Active Pass, was held at Victoria, July 3. The master of the vessel stated that he shaped the vessel's course



Steamship D. A. Thomas, Peace River Tramway & Navigation Company.

ing at the northern terminus. This vessel was laid down at Peace River Crossing in Aug. 1915, and was launched at the end of May this year. She is 170 ft. long by 40 ft. beam, and carries two 25 ton boilers capable of developing 1,000 h.p. Her nominal freight load is 300 tons, and she has been specially designed to push scows carrying a further 2,000 tons. There is passenger accommodation for 250 persons. The vessel contains over 40 staterooms, dining-room with seating accommodation for 100 persons, smoke room, ladies' cabin, baths, etc., and is equipped throughout with electric light and all modern conveniences. She is working on a weekly schedule, leaving Peace River every week for Vermilion Chutes, 330 miles, and Hudson's Hope, 280 miles, alternately, making the round trip in each case in four or five days. Arthur Sutcliffe is Transportation Manager, at Peace River, Alta.

British Columbia and Pacific Coast.

It is reported that five keels have been laid at Vancouver, three at Victoria, and two at New Westminster, of vessels to sail to Europe by way of the Panama Canal.

The Grand Trunk Pacific Coast Steamship Co. has altered its summer schedule for its vessels north of Prince Rupert, so

before reaching Active Pass, and as he was a stranger to the district, he accepted the pilot's assurance that Active Pass was a safe course, although he preferred the outer channel. The pilot, H. R. Jones, had signed a written statement, exonerating all the officers of the Barrister, and assuming full blame for the accident himself. He claimed however that the statement was made under duress. Judgment was reserved.

Tenders are being received for the purchase of the tug Sea Lion, formerly owned by the British Canadian Lumber Co., and at present under charter to the Young and Gore Tugboat Co., Vancouver, the charter expiring Apr. 16, 1917. She was built at Vancouver in 1905, her dimensions being, length 114 ft., breadth 22 ft., depth 19.5 ft., tonnage 218 gross, 148 register. She is equipped with triple expansion engine with cylinders 12, 20, and 32 ins. diam. by 24 ins. stroke, built in Glasgow, Scotland, and she is supplied with steam by a three furnace Scotch boiler at 180 lbs. She is fully equipped with electric lights and an electric searchlight.

Wreck Receivers.—R. Parsons and J. S. C. Watt, Managers, Hudson's Bay Co. at Lake Harbor and Fort Chimo, respectively, have been appointed by the Dominion Government as Receivers of Wrecks for Hudson Strait District.

Mainly About Marine People.

John R. Shaw, heretofore in the Passenger Department, Manila, has been appointed General Agent, Passenger Department, Canadian Pacific Ocean Services, Ltd., Shanghai, China, vice A. J. Blaisdell, deceased.

H. J. Cox, who was appointed assistant to the Chief Surveyor of Lloyd's Register for the United States and Canada, recently, has been engaged since 1915 on the Chief Surveyor's staff in New York, and prior to that year, had held a similar position on the Chief Surveyor's staff in London, England.

Sir Montagu Allan, of Montreal, formerly of the Allan Steamship Line Co., and Lady Allan, who have been in England since the Lusitania disaster, have taken Admiral Keppel's house at Ascot for the summer. Sir Montagu is still engaged with the Pensions Board work at Bath.

G. L. Courtney, formerly General Agent, C.P.R., Victoria, B.C., and latterly a partner in Greer, Courtney and Skene, Ltd., shipping agents, at various points in B.C., has been appointed to a position in the freight department Canadian Pacific Ocean Services, Ltd., Hong Kong, China. He left Vancouver for China early in July.

Robert C. Manson, heretofore Traffic Manager, Canadian Fairbanks Morse Co., has been appointed Soliciting Freight Agent for the eastern section of Montreal, Canada Steamship Lines Ltd., vice T. H. Meehan, resigned to accept other service. Prior to his present appointment, he occupied the positions of Travelling Freight Agent, and chief clerk to District Freight Agent, G.T.R., Montreal, consecutively.

T. H. Meehan, until recently Soliciting Freight Agent, Canada Steamship Lines, Ltd., eastern section, Montreal, is reported to have been appointed Managing Director, T. D. Downing Co., foreign freight contractors and customs brokers, of New York, Boston, and Philadelphia. He entered transportation service with the C.P.R. as an office boy, and was, later on, in G.T.R. service, in the local, divisional, and general freight departments, consecutively, and was subsequently appointed travelling tariff inspector. He resigned from railway service to enter the Richelieu & Ontario Navigation Co.'s service in 1910.

Canada Steamship Lines Notes.

The s.s. W. Grant Morden carried a cargo of grain from Fort William to Port McNicoll, during July, of 490,725 bush., which is claimed to be a record one.

The s.s. Wahcondah, which was fitted out for ocean service recently has loaded a cargo of deals, consigned to Liverpool, England. After delivery of these, she will be used in service between Great Britain and France.

The motor vessel Fordonian, which is being fitted out for salt water service, at Collingwood, is to enter Quebec Steamship Co.'s service between New York and the West Indies, to the regular trading ports on this subsidiary company's division.

The s.s. W. C. Moreland, which is being rebuilt at Duluth, Minn., after having been salvaged, was inspected by James Caruthers, President, Canada Steamship Lines, Ltd., July 18. The after part was all that was salvaged, and this is being fitted with a new fore part. She was wrecked on the Saw Tooth reef in Lake Superior in 1912.

List of Steam Vessels Registered in Canada During June, 1916.

No.	Name	Port of Registry	Where and When Built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
13848	Joyland (1).	Montreal.	Detroit, Mich. 1884	250 5	37 0	14 3	1845	1070	88½ sc.	Lake & River Transportation Co., Montreal.
13849	Kildala	Vancouver.	Vancouver, B.C. 1916	58 9	14 3	6 3	44	30	10 sc.	Kildala Packing Co., Vancouver, B.C.
13849	Rt. I. Fryer (2)	Port Arthur.	West Bay City, Mich. 1888	281 0	41 5	20 0	2033	1158	129½ sc.	J. L. Davidson, Standard Bank Bldg., Vancouver.
13851	Strathdale.	Victoria.	Dumbarton, G.B. 1910	376 5	52 2	25 5	4377	2823	366 sc.	Dollar Steamship Lines, Victoria, B.C.

(1) Formerly Wm. A. Haskell

(2) Recovered wreck

List of Sailing Vessels and Barges Registered in Canada During June, 1916.

No.	Name	Port of Registry	Rig	Where and When Built	Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
138211	A.H. Whitman	Lunenburg, N.S.	Schr.	Mahone Bay, N.S. 1916	97 6	25 0	10 0	94	F. Conrad, La Have, N.S.
138212	C.M. Walters	Lunenburg, N.S.	Schr.	Lunenburg, N.S. 1916	92 3	24 0	9 4	84	W.H. Walters, La Have, N.S.
138147	Crane Island	Quebec, Que.	Schr.	Isle aux Grues, Que. 1915	67 0	24 2	6 6	57	J. B. Bernier, Isle aux Grues, Que.
138080	Edwin A. Grozier	Charlottetown, P.E.I.	Schr.	Essex, Mass. 1862	68 0	20 8	7 4	60	C. Trenholm, Port Elgin, N.B.
122632	Florence Melanson	Weymouth, N.S.	Schr.	Port Elgin, N.B. 1915	88 0	25 6	8 6	99	B.N. Melanson, Gilberts Cove, N.S.
137349	G. of G. No. 2	Vancouver, B.C.	Schr.	N. Vancouver, B.C. 1912	86 5	28 2	6 2	123	Gulf of Georgia Towing Co., Vancouver, B.C.
137888	Grace Hilda	Lunenburg, N.S.	Schr.	La Have, N.S. 1916	75 8	23 5	9 6	83	J.N. Rafuse, La Have, N.S.
138201	Jane Cox	Shelburne, N.S.	Schr.	Shelburne, N.S. 1916	97 7	24 6	10 1	94	G.A. Cox and J.J. Cox, Shelburne, N.S.
138188	Leconfield	St. John, N.B.	Dredge	Holland. 1913	154 6	26 5	9 8	333	E.O. Leahey, St. John, N.B.
138194	Lillian H.	Parrsboro, N.S.	Schr.	Port Greville, N.S. 1916	152 6	36 0	12 8	424	Lillian H. Shipping Co., Fox River, N.S.
137899	Lucille M. Colp	Lunenburg, N.S.	Schr.	Lunenburg, N.S. 1916	107 2	25 8	10 5	95	M. Colp, Lunenburg, N.S.
138156	Pioneer S. & G. Co. No. 11	Vancouver, B.C.	Scow	Seattle, Wash. 1911	133 7	40 0	12 6	645	Coastwise Steamship & Barge Co., Vancouver, B.C.
138037	Sadie No. 4	Victoria, B.C.	Barge	Victoria, B.C. 1913	90 0	32 0	8 0	183	Victoria Tug Co., Victoria, B.C.
138038	Sadie No. 14	Victoria, B.C.	Barge	Eburne, B.C. 1912	83 6	32 0	7 5	164	Victoria Tug Co., Victoria, B.C.
138109	U. Paris	Montreal.	Sloop	Cape Magdalen, Que. 1916	101 7	23 3	6 6	103	U. Paris, Deschailions, Que.
138110	Wayne	Halifax, N.S.	Barge	St. Clair, Mich. 1882	187 0	34 4	13 0	668	Canada Steamship Lines, Ltd., Montreal.
138066	Wm. Thos. Moore	Halifax, N.S.	Schr.	Bethel, Del. 1902	140 0	28 4	9 2	307	H.C. DeWolf, Halifax, N.S.

Dock and Harbor Improvements at Port Dover, Ont.

A press dispatch of July 5, said:—"Port Dover's long deferred hope for better docking facilities is about to be realized. The Public Works Department at Ottawa has plans of proposed improvements, and Martin Todd, Manager of the L. E. & N. Ry. has made arrangements for a car ferry service across the lake if terminal facilities can be secured. A large deputation leaves for Ottawa to-day to interview the Minister of Public Works in the matter, amongst whom are M. Todd, Senator McCall, H. P. Innes, H. Ainsley, Capt. Robinson, John Fisher, M.L.A., W. Weichel, M.P., and F. S. Scott. It is hoped that the vote of \$50,000 to commence the work will be expended before the year is out."

M. N. Todd states that so far as the Lake Erie & Northern Ry. is concerned, the question as to what point on the U. S. side the proposed car ferry from Port Dover will run, when the required harbor improvements are carried out, and the question as to whether an existing car ferry will be made use of, or if a new vessel will be built, have not yet been discussed. There appears to be no doubt, however, that it is the company's intention to establish a car ferry service.

Quebec Harbor Commission.—In consequence of the resignation of Sir William Price, Chairman, Quebec Harbor Commissioners, and of J. B. Letellier, one of the commissioners, as previously announced, D. O. Lesperance, Quebec, has been appointed Chairman, and D. H. Pennington has been appointed commissioner, as from June 15. The third commissioner, A. S. Gravel, Levis, remains.

Canada West Coast Navigation Co., Ltd., has been incorporated under the Dominion Companies Act, with \$2,500,000 capital and office at Vancouver, B.C., to build, own and operate steam and other vessels, docks, wharves, warehouses, and other terminal facilities, and to carry on a general navigation business. The nominal incorporators are all connected with a Toronto legal firm.

Enormous Increases in Steamship Values.

The Liverpool Journal of Commerce, to illustrate the rise in shipping values, gives a selected list of steamships sold in May of this year and a corresponding list of vessels sold in May 1915. Ships disposed of in May 1915 fetched prices ranging from £10 to £37 9s a ton, the average working out at £20 12s. a ton. A year ago the range was only from £5 5s to £18 15s a ton, while the average was £7 12s a ton. Thus the mean value has jumped up in 12 months nearly 200%. One vessel just disposed of for £101,000 fetched £78,000 in January and £36,500 in Aug. 1915. Another now sold for £140,000 realized £100,000 last year and £26,200 in 1914, and a third, which has just fetched £62,000, was sold for £21,000 last year and for £7,800 in 1912. Four others, which were disposed of in 1915 for £177,000, have now been sold for £355,500.

Aliens as Commanders of British Vessels.—Press reports stated recently that orders had been issued forbidding the employment of men of alien birth, whether naturalized British subjects or not, in command of British steamships, but we have been officially advised that the Dominion Government has not issued such an order, nor is the Marine Department aware that such an order has been issued by the British Government. The Marine Department has instructed Canadian shipping owners that they should take all possible steps to ensure that no enemy subjects remain on board any British merchant vessel, no matter what her occupation and voyage.

Vessels Turning in the Rivers at Fort William.—A recent order in council requires all vessels desiring to turn when in the rivers at Fort William, to go into one of the turning basins for the purpose. The Dominion Marine Association has protested against the order on the ground that it works unnecessary hardship on canal sized vessels without corresponding advantage.

Breach of Rules on the Great Lakes.

At a recent meeting of the Great Lakes Protective Association's advisory committee the following resolution was adopted:—"Numerous reports of nonobservance of the outside courses downbound and inside courses upbound in Lakes Superior and Huron, make it highly necessary to take immediate and positive action to prevent this dangerous practice." A number of managers of member companies of the association have declared their intention to suspend for 30 days without pay, the master of any vessel in their fleets for failure to adopt and follow such courses, and necessary means for reporting such cases have been adopted.

Power Development on the St. Lawrence River. The Beauharnois Light, Heat and Power Co. is applying for approval of plans for power development on a large scale, and the Dominion Marine Association has filed objections and made request for an opportunity to examine the plans and express an opinion thereon before any action is taken. It is stated that the proposed works would seriously affect the levels of water in Lake St. Francis. These proposals are not connected with the Canadian Light, Heat & Power Co.'s works in the Beauharnois canal. The Minister of Public Works has given assurance that the Dominion Marine Association will be given an opportunity to examine the proposal before any action is taken.

Shipbuilding in Canada.—Various rumors are current in Montreal as to early future developments in the Canadian shipbuilding trade, and a number of British firms are spoken of as considering the question of starting yards in the Dominion. Some few years ago, when it was considered probable that the Government would order the construction of some war vessels, several of the larger shipbuilders in Great Britain had such a move in view, but as the suggested Government programme did not materialize most of the projects were dropped. However, two British firms did open plants in the Dominion, viz., Canadian Vickers Ltd., at Maisonneuve, Que., and Yarrows, Ltd., at Esquimalt, B.C.

New Steamship for Great Lakes Transportation Company.

The Great Lakes Transportation Co., Midland, Ont., of which James Playfair is President and General Manager, has ordered a steel freight steamship from Thor Iron Works, Toronto. The keel will be laid during this month, and it is expected that the vessel will be launched early in the spring of 1917. The principal dimensions will be: length over all 261 ft., length between perpendiculars 251 ft., breadth moulded 43½ ft., depth moulded 28 ft. 2 in. She will be of the single deck type with poop, bridge and forecastle, steel deckhouse on bridge and chart room on top of deckhouse with navigating bridge. The propelling machinery will be located amidships with coal bunkers in wings. There will be two large cargo holds with two hatches to each hold, one hold extending from the collision bulkhead to the boiler room bulkhead and the other from the engine room bulkhead to the after peak bulkhead, all made water tight and divided by water tight transverse floors into a suitable number of compartments. She will be built to Lloyd's specifications and to highest class of British Lloyd's ocean service, and equipped in accordance with the requirements of the British Board of Trade. The machinery space will equal as near as possible, 13% of the gross tonnage so as to attain a reduction of 32% from capacity tonnage.

The hull will be built with flat plate keel and bilge keels, the latter to extend for about 100 ft. amidships and to be of plate 9 ins. deep connected to shell with angle bars fitted on short lengths extending from butt to butt of shell, the plate to be continuous. There is to be a straight stem and elliptic stern, and channel frame is to be fitted extending from tank margin to main deck without hold stringers or 'tween deck beams. The propeller frame is to be of wrought iron or cast steel with sufficient bearing in boss for propeller tube, and the rudder post will extend to the main deck and be attached thereto with angles and deep transom plates. The rudder will be of the single plate type of wrought iron or cast steel, with arms alternately on the port and starboard sides. The hull will be divided into four water tight compartments, and a water tight sliding door will be fitted to the engine room bulkhead 36 ins. high by 21 ins. wide.

The propelling machinery will consist of triple expansion engine with surface condenser, built in type, with three cylinders each working on a separate crank at an angle of 120 degrees. The cylinders to be 20, 33, and 54 in. diam. with a common stroke of 40 in., with an average h.p. of 1,200 and a maximum of 1,300. Steam will be supplied by two Scotch boilers with return tubes, at a working pressure of 100 lbs. They will each be 14½ ft. inside diam. by 11 ft. long with interchangeable furnaces and heating surface of 5,250 sq. ft., with grate surface of 126 sq. ft., and equipped for natural draught. The machinery is being built by the John Inglis Co., Ltd., Toronto. The electrical installation will consist of one 7½ k.w. generator and complete lighting system, the sidelights being arranged for electric as well as oil light. In addition to the propelling machinery, there will be a complete system of pumps, capstans and the usual sundries, as well as all life saving apparatus and boats in accordance with the Dominion Government inspection rules.

The Loss of the Tug Frank C. Barnes.

An investigation into the loss of Canada Steamship Lines' tug, Frank C. Barnes, Nov. 2, 1915, in the neighborhood of Point Peter, Lake Ontario, when all hands were lost, was held at Toronto, July 5. The investigation was held at the request of a sister of the late engineer, on the ground that the vessel was unseaworthy when she left Port Colborne. The owners were represented by Francis King, M.A., Counsel for the Dominion Marine Association, and the enquiry was conducted by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. J. B. Foote and James McMaugh, as nautical assessors.

H. W. Cowan, Operating Manager, Canada Steamship Lines, stated that the equipment and general operations of vessels came under his supervision. In May, 1915, the Frank C. Barnes was purchased as an aid to other tugs for harbor work; but not needing the vessel for that season she was taken from Port Arthur to Port Colborne and tied to a dock until late in October, when Capt. Herbert LaRush, one of the most efficient masters in the company's service, was ordered to take her to Sorel, Que., where it was intended that she should undergo a thorough overhauling. The instructions issued to his representative at Port Colborne and to the master, were that the vessel was to be taken to Sorel, leaving the master absolutely free in choosing the date of departure, when weather conditions were favorable, and that there was no hurry in reaching Sorel. The company made it a point to leave these questions to the master who is the only man who should know when and how the vessel should be sailed. The general order to fit the vessel, which was issued to Capt. LaRush, included the clearing of the vessel at the customs house. With regard to the fact that the boat had not been officially inspected for two years, he stated that he was absolutely ignorant of that particular, as this was left to the master and the collector of customs. He assumed that when the tug was bought she carried the certificate of inspection, and that it was the master's duty to enquire, as his orders were to fit the vessel for the journey. Other evidence gave details of times at which the tug had been met and passed by other vessels, and also particulars of the weather conditions at the time, and none of it indicated that the tug was unseaworthy. The person at whose request the investigation was held, did not appear in person, and no witnesses were brought forward to substantiate her suppositions, or the rumors circulated. The court's judgment is summarized as follows:—

Notwithstanding the fact that the tug was old, and in need of repairs to her hull, there is nothing to show that Canada Steamship Lines, through its representatives, is in default for neglecting to take precautions to ensure the safety of the crew. The master was an able, intelligent, competent man, and in taking command of the tug to take her to Sorel he was left free to use his own judgment in navigating her. Since he left without remonstrating it shows that he did not apprehend any disaster through her possible unseaworthiness. In the absence of evidence on the crew's side, the court accepts the statements of the company's representatives, that the master requisitioned for articles needed for the trip, which were delivered without question.

As to the equipment and life saving appliances, it is said that there were at least one circular buoy and several life belts, one of which was found on the beach not far from the place where the engineer's body was recovered. There was also a metal life boat for which two oars were supplied before leaving Port Colborne. As there is no law governing the inspection of hulls of tug boats, the court cannot examine any official record, but must accept the statement given that the vessel needed repairs. While in dock from May to November she was not leaking to any extent, requiring only a little pumping once daily. On the day of the departure the weather appears to have been anything but threatening, but subsequently a fresh breeze sprang up from the westward, which increased in intensity, and the records show that on the morning the tug disappeared the wind had a velocity of 31 miles an hour, causing a heavy sea which forced the s.s. Seagun to seek shelter.

A personal log found on the body of Capt. LaRush was produced, and the court failed to note any entry indicating doubts or apprehension on his part. The company, in verbally notifying the master to take his own time, and otherwise giving him a free hand as to the manner in which he was to take the tug to Sorel, relieved itself of any blame for this deplorable casualty. With regard to the state of the boilers, though the court has on its file a memo to the effect that no inspection of the boilers had been made for the last two years—which in itself is a violation of the statutes—this cannot be accepted as a factor in bringing about this disaster, for the following reason, that the chief engineer held a first class Board of Trade certificate as engineer, and when joining the tug, if anything defective had been found with the boilers or machinery, he would naturally have requisitioned for repairs; but no request of that nature appears to have been made, other than a requisition for oils, packing, and the usual engine room necessities for every voyage.

Therefore, analysing all the facts and reports which have been submitted, and in view of the weather conditions existing that morning, when larger vessels had to seek shelter, the court cannot arrive at any other conclusion than that either one of two causes could have brought about this disaster, either the tug shipped a sea over the stern, or she broached to, and while in the trough of the sea, capsized. These are the only two theories the court can advance. Consequently in view of such conclusion it holds both the owners of the tug, her master, Captain LaRush, and her engineer, A. McG. Cummings, blameless, and finds that this disaster can be attributed to unforeseen and unavoidable circumstances, in fact, to an act of God.

The court expresses its sincere sympathy with the relatives of those who unfortunately lost their lives on this vessel.

Among the Express Companies.

R. W. Burnham has been appointed acting agent, Canadian Northern Ex. Co., Brockville, Ont., vice A. F. Schussler.

The Canadian Northern Ex. Co. has opened offices at Huberdeau, Montfort, Morin Heights, Perthuis, St. Sauveur and 16 Island, Que.; Beachburg, Ont., and Alliance and Sanguo, Alta.

The Canadian Ex. Co. has opened offices at Juneau, Ketchikan and Skagway,

Alaska. The service is operated to Prince Rupert, B.C., over the Grand Trunk Pacific Ry., and thence by the Grand Trunk Pacific Coast Steamship Co.'s vessels.

R. Chambers, heretofore clerk, Dominion Ex. Co., Brandon, Man., has been appointed cashier at Swift Current, Sask.

The Dominion Express Co. has opened offices at Aldershot, N.S.; Beaulieu, Que.; Castleford, Ont.; Elbor and Regent, Man.; and Antelope, Regina Beach and Willows, Sask.

The Canadian Northern Ex. Co. has established its service over the C.N.R. on the following routes:—between St. Jerome and Huberdeau, Que., superseding the Dominion Ex. Co.; between Ottawa and Pembroke, Ont.; between Winnipeg and Virginia Beach, Man.; between Melfort and St. Brieux, Sask., and between Peace River Jct. and Sanguo, Alta.

The Canadian Ex. Co. has opened offices at Hawkshaw, N.B.; Armagh, Damien, Fitzpatrick, St. Euphemie and Sanmaur, Que.; Falkenburg, Hudson and Quibel, Ont.; Smiley, Sask.; Spruce Grove, Alta., and Burns Lake, B.C., and has also reopened its summer offices at Elgin House, Muskoka Wharf, Port Carling, Rosseau and Windermere, Ont.

Telegraph, Telephone and Cable Matters.

M. B. Douglas, heretofore local manager, Great North Western Telegraph Co., St. Catharines, Ont., has been appointed local manager at North Bay, Ont., and has been succeeded at St. Catharines by John Frazell.

Four additional cables have been laid recently in Passamaquoddy Bay and the Bay of Fundy, N.B. The starting points of these cables is at Eastport, Me., and they connect at Deer Island, Grand Manan, and Campobello.

Edwin Pope, Superintendent of Dominion Government Telegraphs, Quebec, Que., was advised recently that his son, C. A. Pope, had been killed in action. A second son, H. B. Pope, has also been reported to have been killed in action.

The Great North Western Telegraph Co. is installing a Morkrum printing equipment on the line between Toronto and Chicago. Other circuits in operation are between Montreal and New York, Ottawa and Montreal, Toronto and Ottawa and Toronto and New York.

The annual report of the Marconi Wireless Telegraph Co., the parent concern, shows a net profit of £377,817, an increase of £145,000 over the previous year. The general reserve account stands at £967,530, and investments and temporary loans show an increase of £173,500.

The Western Union Telegraph Co. reports that for the six months ended June 30, the total revenue was \$29,125,269, an increase of \$4,909,562 over the same period in 1915. The total expenses were \$18,396,064 against \$15,550,540, and the balance \$6,846,677 against \$4,781,037. Deducting interest of \$665,825, the net income for the first half year of 1916 was \$6,180,752.

At the recent annual meeting of the Marconi International Marine Communication Co., in London, Eng., G. Isaacs, who presided, said that he was authorized to announce that in the very near future, Mr. Marconi would introduce a new, independent, and very simple apparatus, to be worked from the bridge of a vessel by an officer, which should put an end to

all danger of collision in darkness and fog.

The Dominion Telegraph Co.'s annual meeting was held at Toronto, July 12, when the report for the year ended June 30 showed total assets of \$1,310,576.28, and liabilities \$1,017,773.96, including dividend payable July 15, \$14,000. The company's property is leased to the Western Union Telegraph Co. for 99 years from July 1, 1879, and it receives a guaranteed interest of 6% a year, and this has been paid quarterly in advance for the past 37 years. Mention was made of the death during the year of Belvidere Brooks, one of the directors, and the election of G. W. E. Atkins of New York, to fill the vacancy. Following are the directors for the current year:—Sir Henry M. Pellatt, President; Aemilius Jarvis, Vice President; F. Roper, Secretary and Treasurer; G. W. E. Atkins, R. C. Clow-C. P. O'Reilly, and G. P. Schofield.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Du Pont Products.—A book with this title (111 pgs., 5 x 8 in.) has been issued, giving a list of 251 distinct commodities manufactured by the Du Pont industries, viz.:—E. I. Du Pont De Nemours & Co., Du Pont Fabrikoid Co., Du Pont Chemical Co., and the Arlington Co. at Wilmington, Del. Among the articles listed are a considerable number used by steam and electric railway and navigation companies, car and locomotive builders and contractors.

Roberts & Schaefer Co., engineers and contractors, Chicago, report the following orders. From Pennsylvania Rd., 300 ton capacity, 2-track, automatic electric counterbalanced bucket locomotive coaling station at Erie, Pa., also two Rands gravity sand plants, using the Beamer patent steam sand dryer. From Chicago, Rock Island & Pacific Ry., 2 Rands measuring coal loaders for recording locomotive coal. From Illinois Central Rd., for rebuilding a 600-ton capacity 3 track reinforced concrete locomotive coaling plant, at Effingham, Ill., using automatic electric elevating equipment and Rands silent traction hoist.

The Locomotive Superheater Co. reports that the oil tank s.s. Pearl Shell, launched recently at Wilmington, Del., for the Shell Oil Co., of San Francisco, is the first ship built in America to be equipped with fire tube superheaters. She is equipped with three Scotch marine boilers, fitted with Locomotive Superheater Co.'s fire tube superheater, supplying superheated steam to triple expansion engines developing 2,400 h.p. The superheaters were applied after the purchasers had satisfied themselves of the economy and reliability in operation, of a superheater of the same design applied to one of their existing steamships of approximately the same size. They have also ordered sufficient superheater equipment to convert five of their existing vessels. There are about 1,500 steamships, representing over 2,000,000 h.p., sailing from ports outside America which are equipped with fire tube superheaters.

Transportation Conventions in 1916.

Aug. 15-17.—International Railroad Blacksmiths' Association, Chicago, Ill.
Aug. 16 to 18.—American Association of Railroad Superintendents, Memphis, Tenn.
Aug. 24-26.—American Railway Tool Foremen's Association, Chicago, Ill.
August 29.—International Railway General Foremen's Association, Chicago, Ill.
Sept. 5 to 8.—Traveling Engineers' Association, Chicago, Ill.
Sept. 12-14.—Master Car and Locomotive Painters' Association of United States and Canada, Atlantic City, N.Y.
Sept. 12-14.—Railway Signal Association, Mackinac Island, Mich.
Sept. 19-22.—Roadmasters and Maintenance of Way Association, New York.
October 3-5.—Railway Fire Protection Association, New York.
Oct. 9-13.—American Electric Railway Association, Atlantic City, N.J.
October 10.—Association of Manufacturers of Chilled Car Wheels, New York.
Oct. 17, 18.—American Association of Passenger Traffic Officers, Washington, D.C.
October 17-19.—American Railway Bridge and Building Association, New Orleans, La.
October 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Philadelphia, Pa.
Oct. 18-20.—Society of Railway Financial Officers, Washington, D.C.
Oct. 19-21.—American Association of Dining Car Superintendents, New Orleans, La.

Transportation Associations, Clubs, Etc.

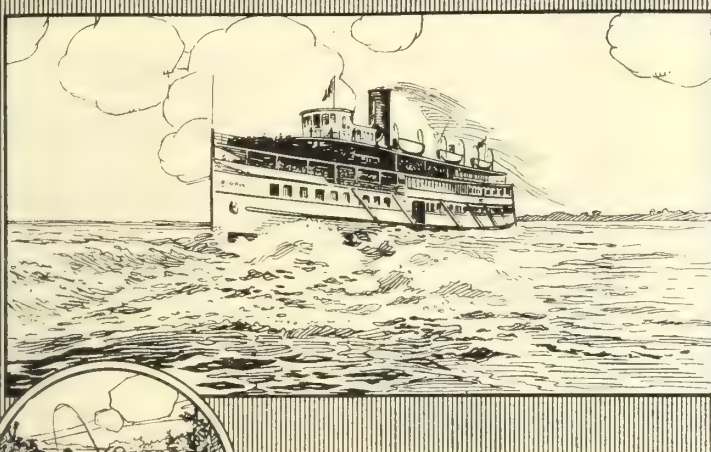
The names of persons given below are those of the secretaries unless otherwise stated:

Canadian Car Service Bureau—W. J. Collins, Manager, 401 St. Nicholas Building, Montreal.
Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.
Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.
Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.
Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.
Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.
Canadian Ticket Agents' Associations—E. de la Hooke, London, Ont.
Dominion Marine Association—F. King, Counsel, Kingston, Ont.
Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.
Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.
Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.
Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.
Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.
Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.
International Water Lines Passenger Association—M. R. Nelson, New York.
Niagara Frontier Summer Rate Committee—James Morrison, Montreal.
Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.
Quebec Transportation Club—A. F. Dion, Quebec.
Shipping Federation of Canada—Thos. Robb, Manager, 42 St. Sacramento Street, Montreal.
Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.
Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.
Transportation Club of Vancouver—H. W. Schofield, 553 Granville St., Vancouver, B.C.
Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.
Western Canada Railway Club—Louis Kon, Box 1707 Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.
Winnipeg Traffic Club—James Gehrey, Bannatyne Avenue, Winnipeg, Man.

Railway Lands Patented.—Letters patent were issued during June, in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta, and British Columbia, as follows:—

Alberta & Great Waterways Ry.	7.28
Calgary & Edmonton Ry.	3,504.00
Canadian Northern Ry.	320.00
Canadian Pacific Ry.	244.48
Grand Trunk Pacific Branch Lines Co.	12.39
Qu'Appelle, Long Lake & Saskatchewan Rd. & Steamboat Co.	3,805.02
Total	7,893.18

"NIAGARA TO THE SEA"



The Saguenay River with its wealth of scenic beauties—its exhilarating atmosphere—is a never-ending source of enjoyment. Shorter trips at proportionate rates.

WRITE for our beautifully illustrated booklet "Niagara to the Sea". It tells about a vacation trip every minute of which you will enjoy. Enclose 6c. to cover postage.

5-Day Tour to Montreal and return including meals and Berth... **\$25.**

6-Day Tour to Quebec and return including meals and Berth... **\$34.**

8-Day Tour to Chicoutimi and return including meals and Berth... **\$47.**

15-Day Tour to Nova Scotia and return including meals and Berth... **\$87.65**

Canada Steamship Lines, Limited

46 Yonge St., TORONTO
R. & O. Bldg., MONTREAL
or any Ticket Agent.



Department of Railways and Canals, Canada.
CANADIAN GOVERNMENT RAILWAYS

Halifax Ocean Terminals, Railway, Halifax, N.S.

SEALED TENDERS addressed to J. W. Pugsley, Secretary, Department of Railways and Canals, Ottawa, Ont., and marked on the outside: "Tenders for Halifax Ocean Terminals Passenger Station," will be received up to and including Monday, August 7, 1916, for the construction and erection of Passenger Station at Halifax, N.S.

Plans, specifications and blank form of contract may be seen on and after July 15, 1916, at the offices of the following:—

Chief Engineer, Department of Railways and Canals, Ottawa, Ont.

Chief Engineer, Canadian Government Railways, Moncton, N.B.

Superintending Engineer, Halifax Ocean Terminals, Halifax, N.S.

Ross and Macdonald, Architects, 1 Belmont Street, Montreal, P.Q.

Ross and Macdonald, Architects, 908 Royal Bank Building, Toronto, Ont.

Contractors who wish to obtain plans and specifications temporarily for their own use may obtain same from Ross and Macdonald, Montreal, on depositing with them a certified bank cheque in favor of the Canadian Government Railways for the sum of One Hundred Dollars (\$100), which will be refunded on the return of the plans and specifications to them.

All the conditions of the specifications and contract form must be complied with.

Tenders must be submitted in duplicate on the blank form of tender which may be obtained from any of the Offices at which plans are on exhibition.

A security deposit will be required as called for in tender form.

The lowest or any tender not necessarily accepted.

F. P. GUTELIUS,
General Manager,
Canadian Government Railways.

Moncton, N.B., July 10, 1916.



Showing the construction of our geared jacks.

Celebrated "H & E" Lifting Jack

Our Patent Ball-Bearing Geared Jacks are Ideal in Railroad and Heavy Construction Work.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

SHERBROOKE, QUE.

Sole Agents for Brakeshoes for Canada outside of B.C.: Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for B.C.: The B.C. Equipment Co., Vancouver, B.C. Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.

NOTICE.

Re. Canadian Patent No. 156,598, of June 30, 1914, on Furnace Grates.

The undersigned is ready and willing to negotiate with all persons desiring to manufacture under the above patent in Canada.

Marcus E. Hansell,
c/o Canadian Railway and Marine World, 70 Bond Street, Toronto.

FOR TICKET CASES AND COMMERCIAL FURNITURE

of all descriptions to stock
or special design, apply to
The Canadian Office and School Furniture Co.,
Limited
Preston - Ontario

High Grade Electric
STEEL CASTINGS
MANGANESE STEEL
For Crusher Jaws and Heavy
Wear Parts

BRONZE

M.C.B. Standard Journal Bearings and Engine Bearings

Improved Reinforced Steel-Backed

BRAKESHOOES

Locomotive Driver and Truck Shoes. Freight and Passenger Car and Electric Car Shoes.

VESSEL FOR SALE.

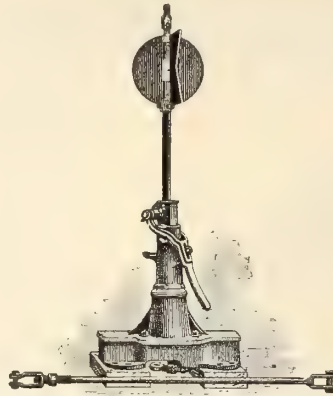
Steel hull former side-wheel passenger steamer "Picton," in first class condition; hold clear and decked over; all machinery removed; carrying capacity approximately 600 tons. Length 190 ft.; breadth moulded 28 ft.; depth moulded 13 ft.; draught forward 3 ft., draught aft 4 ft. Low price for quick sale. Apply Lake Simcoe Ice Supply Co., Ltd., Toronto.

The s.s. Honoreva, an ocean tramp steamship, was reported to be loading meat at Chicago, during July, for shipment to Europe. She was spoken of as the first ocean going steamer to be seen on the Great Lakes this year.

RAMAPO

Automatic Safety Switch Stands

in types to suit every
purpose, Main Line,
Sidings and Yards



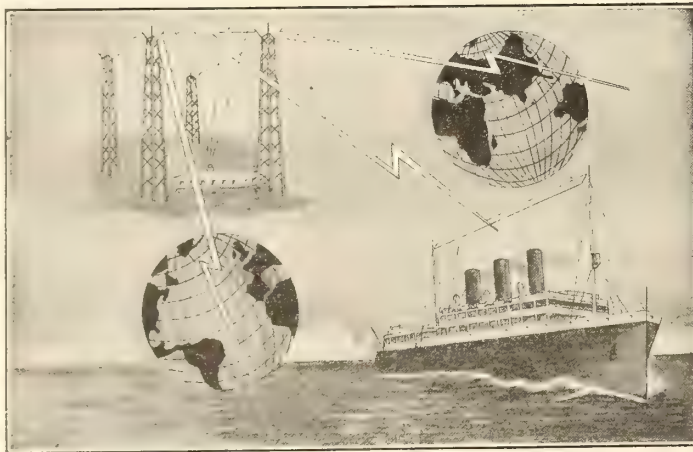
We also
make

FROGS SWITCHES CROSSINGS

in both all rail
and Manganese

CANADIAN RAMAPO IRON WORKS, Limited, Niagara Falls, Ont., Can.

"Marconi" Wireless Telegraph Apparatus



THE WORLD WIDE WIRELESS

We supply installations on Land, Ship, Railway
and Aeroplane. Sets range from 50 to 2,000 miles.

Demonstrated.

That Merchant and Pleasure Craft cannot afford
to be without a MARCONI EQUIPMENT.
Every passenger steamer worth the name is now
equipped with Marconi Wireless. Over 2,000
vessels now equipped.

Canadian Marconi Company

137 McGill Street, MONTREAL



These Reinforced Brake Shoes weighed approximately
twenty pounds each when put in service. When
ready for the scrap heap, after long and satisfac-
tory use, they weighed about six pounds each.

Just compare this record with that of ordinary unrein-
forced brake shoes. Almost invariably they go
to pieces before being half worn out, and their
average scrap weight is about fifteen pounds.

No argument for ordinary shoes can meet the demon-
strated facts that stand behind Reinforced Brake
Shoes.

Manufactured in Canada.

Dominion Brake Shoe Company, Limited

The HOLDEN CO., Limited, Agents,
350-356 St. James Street, MONTREAL

The Light of Day on the Right of Way

Headlights

Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

Car Lighting

Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency with economy. Standard cylinder supplies from one to two months' lighting of the average car.

Signals

Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

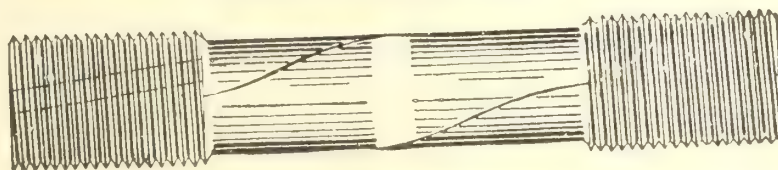
Commercial Acetylene Railway Light and Signal Company
103 BAY STREET, TORONTO

Main Office, 80 Broadway, New York

Branches, Atlanta, Boston, Chicago, San Francisco

American Flexible Staybolts

Manufactured in Montreal



Made of the best standard staybolt iron, adding flexibility by process of making as shown above---closely approximating a rope structure.

Write for booklet on subject.

TAYLOR & ARNOLD, Limited
MONTREAL WINNIPEG

Jas. W. Pyke & Company, Limited

Iron, Steel and Metal Merchants

Locomotive, Driving, Engine and Tender Truck Axles, Passenger, Freight, and Electric Tram Car Axles—To Standard or Railway's own Specification.

Staybolt and Engine Bolt Iron—Quality and Service Unexcelled.

Steel Plates—Firebox, Flange and Tank Qualities.

Structural Shapes—Beams, Channels, Angles, Tees, Zees, etc.

Steel Billets and Forgings—of all descriptions.

Locomotive Boiler and Superheater Tubes—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
232 St. James Street,

Montreal



*"We've got to
save our concrete floors"*

"Our cement floors are comparatively new and are the best we could lay down, but the surface is already sanding, water is getting spilled on them and they are soaking up oil. I tell you, gentlemen, we have got to save them."

**R.I.W. CEMENT FILLER
& CEMENT FLOOR PAINT**
REMEMBER ITS WATERPROOF
REG. U.S. PAT. OFF. PATENTED AS TO PORTLAND CEMENT FEB 27, 1906

will keep cement floors wearproof, waterproof and oilproof.
Scuffed off dust won't float in the air to ruin merchandise,
get into bearings and cause electric motors to spark.
Oil won't get in, never to be gotten rid of, to injure the
concrete.

R. I. W. Cement Filler and Cement Floor Paint fill up the
sandy, porous surface and prevent all wear on the floor itself.
Twelve standard shades.

Let us mail you a special booklet. Address Dept. 56.

Manufactured in Canada by
**R.I.W. DAMP-RESISTING PAINT CO.
TOCH BROTHERS**

Gerrard St. and Carlaw Ave.
TORONTO, ONTARIO, CANADA

ENAMELED IRON SIGNS

The ideal signs for
**Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.**

We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc,

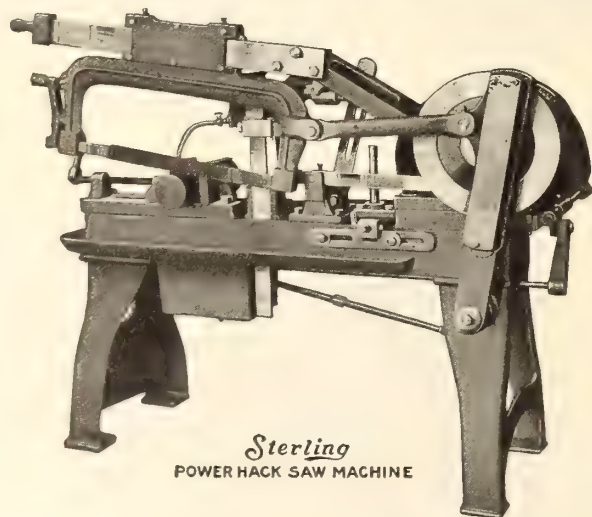
Guaranteed not to
fade or be affected
by the weather in
any way.

**Acton Burrows
Limited**

Enameled Iron Signs

70 Bond Street - Toronto

"STERLING" High Duty Power Hack Saw Machine



Sterling
POWER HACK SAW MACHINE

Cuts round material up to and including 6 in.

Manufactured by

**Diamond Saw & Stamping Works,
Buffalo, N.Y., U.S.A.**



Which Method

prevails in your plant? Does it take two men to do one man's work.

Why don't you replace that old antiquated tool with a new up to date

Reece's New Screw Plate

These pictures do not exaggerate conditions as you can actually see them, if you will visit Machine Shops throughout the country.

Lessen your cost by giving your mechanics a REECE'S NEW SCREW PLATE.

Butterfield & Co., Inc.

Rock Island, Que.

Dominion Bridge Company, Limited

Head Office and Works,
MONTREAL, P.Q.

Branch Offices and Works,
TORONTO, OTTAWA and WINNIPEG



Lachine Bridge

Engineers, Manufacturers and Erectors of Steel Structures.
CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

Large Stock of Standard Structural Material at all Works.

INTERNATIONAL CORRESPONDENCE SCHOOLS
Box 8407, SCRANTON, PA.

Pass *The Undersigned*

to a full understanding of how he (or she) can qualify for advancement and success in the position before which is marked X.

- | | |
|---|--|
| <input type="checkbox"/> Locomotive Engineer | <input type="checkbox"/> Surveying and Mapping |
| <input type="checkbox"/> Locomotive Fireman | <input type="checkbox"/> R. R. Constructing |
| <input type="checkbox"/> Travelling Engineer | <input type="checkbox"/> Bridge Engineer |
| <input type="checkbox"/> Travelling Fireman | <input type="checkbox"/> Architect |
| <input type="checkbox"/> Air Brake Inspector | <input type="checkbox"/> R. R. Agency Accounting |
| <input type="checkbox"/> Air Brake Repairman | <input type="checkbox"/> R. R. Genl. Office Acc'ting |
| <input type="checkbox"/> Round House Foreman | <input type="checkbox"/> Bookkeeper |
| <input type="checkbox"/> Trainmen and Carmen | <input type="checkbox"/> Stenographer and Typist |
| <input type="checkbox"/> Railway Conductor | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> Mechanical Engineer | <input type="checkbox"/> Advertising Man |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> Civil Service |
| <input type="checkbox"/> Machine Shop Practise | <input type="checkbox"/> Electrical Engineer |
| <input type="checkbox"/> Boiler Maker or Designer | <input type="checkbox"/> Telegraph Expert |
| <input type="checkbox"/> Steam Engineer | <input type="checkbox"/> Practical Telephony |
| <input type="checkbox"/> Steam-Electric Engineer | <input type="checkbox"/> Chemist |
| <input type="checkbox"/> Civil Engineer | <input type="checkbox"/> Automobiles |

Name _____

Occupation & Employer _____

Street and No. _____

City _____ State _____

"Here's Your Pass!"

Have you ever stopped to consider what this coupon may be worth to you? It is the offer of the largest educational institution in the world, having 25 years' experience in qualifying hundreds of thousands of people for better positions, to help YOU to obtain the advancement and promotion that you want and should have.

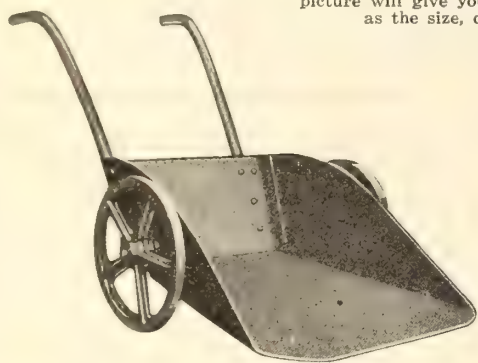
If YOU really want to better yourself, the International Correspondence Schools can help you, no matter how poor your circumstances, nor what your age, nor how scant your education may be. No time lost from your present work. No books to buy. Pay on terms you can afford. If you realize the worth of this coupon, mark it and mail it to the Schools. It puts you under no obligation. It is simply a free way to *find out* how to make a success of your life.

USE YOUR PASS NOW

Box-Car Un- loaders



Not as bad as it looks, for they are both laughing—but the picture will give you an idea of the strength, as well as the size, of these Box-car Unloaders.

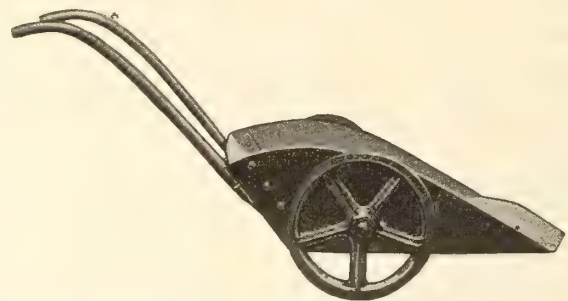


☞ The Wheels are cast iron, running on roller-bearings with forged axles.

☞ The Tray—about 30 in. x 30 in. x 11 in. deep—is made of heavy sheet steel, the handles of pipe, making the whole Unloader very light and very strong.

☞ Can be used for unloading and carrying Coal, Grain, Sand, Cement, Gravel, Coke, etc., etc.

PRICE \$25.00 EACH
Special discounts allowed on quantities.



Write for prices and further particulars to the Manufacturers

Polson Iron Works, Limited, Toronto, Ont.

Steel Shipbuilders, Engineers and Boilermakers.

Consolidated

600 volt—Switches—1800 volt

ARE

MECHANICALLY AND ELECTRICALLY
CORRECT

Write us for further information.

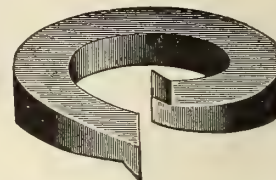
Consolidated Car-Heating Co.

New York — Albany — Chicago

DAWSON & CO., AGENTS
148 McGill Street, MONTREAL, QUEBEC.

The Positive Lock Washer

is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks

The Positive Lock Washer Co.

Sole Mfrs., Newark, N.J.

F. H. HOPKINS & CO.,

Agents, Montrea

NOTICE.

The General Railway Signal Company of the United States of America, the owner of the exclusive rights to Canadian patents No. 92323, No. 93127, No. 96256, and No. 97758, issued to Young and Townsend, and covering methods of signaling electrified railways, wishes to call the attention of all possible users of the devices and systems covered by such patents to the fact that it is prepared to sell and furnish, at short notice, all such devices and to install such systems upon any railway in the Dominion of Canada.

All inquiries regarding the above should be addressed to The General Railway Signal Company of Canada, Limited, Lachine, Province of Quebec, Canada.

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Celebrated Wheel Truing Brake Shoe.
Best Wheel Grinders in the World.

Car Closets

Flush or Dry

DUNER CO.

101 S. CLINTON ST.
CHICAGO

C. W. Sherman, Pres. and Gen. Mgr.

F. W. Ballie, Vice-Pres.

A. G. Wright, Secy.

Dominion Steel Foundry Company, Limited, Hamilton, Ont.

Locomotive Frames

Car Bolsters

Car Castings

Heavy Machinery Castings

Sessions-Standard Friction Draft Gear

Simplest and Best

Both
Made by

Standard Coupler Co.

30 CHURCH STREET, NEW YORK

Standard Steel Platforms

Used by all Canadian Railways



Copyrighted by International News Service.

Why?

A defective signal wire might easily cause just such an awful wreck as this.

Why take the chance?

To safeguard your road against such catastrophes you should not only have the best signalling equipment but you must use

Northern Electric Railway Signal Wire

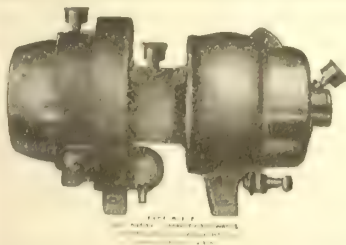
No conditions impose a severer test on wire than those used in connection with a railroad signalling system.

Northern Electric R.S.A. wire meets the R.S.A. specifications in every particular and goes a step further—it meets the more rigid Northern Electric specifications which gives you, the user, double protection.

Buy your wire and cable from the largest makers in Canada.

Northern Electric Company LIMITED

MONTREAL HALIFAX TORONTO WINNIPEG
REGINA CALGARY VANCOUVER



70 Schroeder Incandescent Headlights

In Service
270 days without any expense for repairs.
As a result of this exceptional service
150 more have just been ordered.

The HIRAM L. PIPER CO., Limited

MONTREAL, Sole Agents for Canada

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. BABBITTS. Miscellaneous Brass Castings for Railroads.

Works and Office: 69 Delorimier Avenue, MONTREAL, QUE.

ESTABLISHED 1849.

BRADSTREET'S

Capital and Surplus, \$1,500,000.
Offices throughout the Civilized World.

Executive Offices:
NOS. 346 and 348 BROADWAY,
N.Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA:

Halifax, N.S.; Hamilton, Ont.; London, Ont.;
Montreal, Que.; Ottawa, Ont.; Quebec, Que.;
St. John, N.B.; Toronto, Ont.; Vancouver, B.C.;
Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.;
Victoria, B.C.

THOS. C. IRVING,

Gen. Man. Western Canada, Toronto.

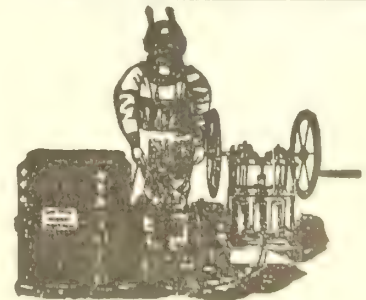
Rails, Cars, Locomotives

and Contractors' Equipment

IMMEDIATE
SHIPMENT

John J. Gartshore

58 Front St. West
TORONTO



JOHN DATE

Manufacturer of

Diving Apparatus

For Sale or Hire

Brass Founder and Coppersmith
13-15 Concord St., Montreal

Hunt-Spiller Gun Iron

IN

Locomotive Castings

SAVES MONEY

INCREASES: Engine Efficiency—Engine Mileage.
DECREASES: Engine Failures—Engine Repairs.

MADE ONLY BY

Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

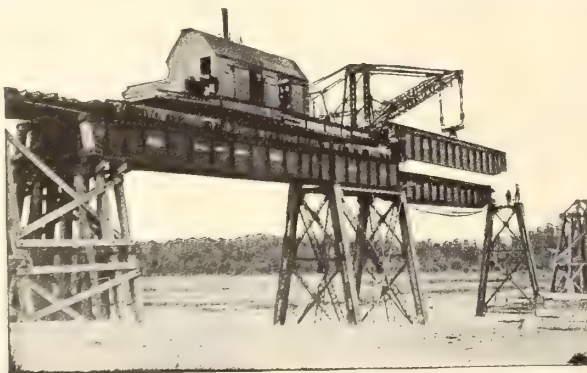
Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.

J. G. Platt,
Sales Manager.

Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.

"BEATTY" HOISTS

For situation where the work is severe and the service exacting—"a Beatty always fills the bill"



Derrick car engaged with an 8 x 12 four drum Beatty Hoist placing an 80 foot deck plate girder span in Skugog River Bridge.

Let us know your requirements for
Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

We will gladly send full information.

M. Beatty & Sons Limited - Welland

Toronto Office—Goodyear Bldg. Telephone Adelaide 208.

Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg, Winnipeg.

John Morrow Screw & Nut Co., Limited.

BUSINESS AS USUAL

Set Screws
Cap Screws
Nuts, every variety of finish
Twist Drills, etc.

Customers are requested to place their specifications with us as far ahead of their actual needs as possible so that we may give them good service.

INGERSOLL - ONTARIO

Insist on having

DREWRY'S American STYLE RICE BEER

The best beer—
without exception

E. L. Drewry, Ltd., Winnipeg

Electric Railway Supplies

Detroit Controller Checks.
Peerless Check Valves.
Hollis Safety Fender.
Bakalite Arch-leaves, Brush holders
Yokes and Rods.
Bakalite Washers and Asbestos Board.
Gongs, Bells and Air Whistles.

Allen General Supplies, Ltd.
205 Yonge Street Toronto

IMPERIAL BANK OF CANADA

Capital Authorized.....\$10,000,000
Capital Paid up.....7,000,000
Reserve Fund.....7,000,000

Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the World.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.

Engineers and ContractorsEdward F. Terry
PresidentFrederick Tench
V. P. & Treas.**The TERRY & TENCH CO., Inc.***Bridge Builders*General Contractors, Engineers and Designers
Grand Central Terminal NEW YORK**THE ARNOLD COMPANY**ENGINEERS—CONSTRUCTORS.
ELECTRICAL—CIVIL—MECHANICAL
REPORTS, DESIGN AND CONSTRUCTION
Complete Railway Shop and Terminal Properties—
Electrification of Steam Railroads.
OUR EXPERIENCE COVERS THIRTY-FIVE PLANTS
Chicago, Illinois.**ANGUS SINCLAIR, C.E.***Railway Contractor*Office: Imperial Bank Building,
King and Sherbourne Sts., Toronto.**JACOBS & DAVIES, Inc.***Consulting Engineers*

MONTREAL LONDON NEW YORK

Foundations, Subaqueous and Land Tunnels, Subways, Railways, Harbours, Waterpower Development, Examinations, Reports.

Montreal Office: Eastern Townships Bank Building

Locomotive COALING STATIONS**ROBERTS AND SCHAEFER CO.**ENGINEERS AND CONTRACTORS
CHICAGO, U.S.A.**Patent Solicitors****VAN-HALLEN & O'NEIL****REGISTERED ATTORNEYS**

at Washington and Solicitors of Canadian and Foreign Patents, Copyrights, Trade Marks, Searches.

Head Office, 103 Farmer Building, 333 Main Street,
WINNIPEG, MAN., Canada**PATENTS****HERBERT J. S. DENNISON**Mechanical Engineer. Patent Attorney and Expert.
Patents, Trade Marks, Designs, Copyrights, and Infringements. 20 Years experience in Patents and Practical Engineering.Star Building, 18 King Street West, Toronto
WRITE FOR BOOKLET.**PATENTS SECURED OR OUR FEES RETURNED.**

Being next door to the Patent Office, we have personal interviews with Examiners, thus earlier allowance of your Patents. We have access to all Records and solicit the business of Manufacturers, Engineers and others who realize the advisability of having their Patent business transacted by Experts.

HAROLD C. SHIPMAN & CO.
Reg. Patent Attorneys, Ottawa, Canada**Minarets and Mountain Peaks**

at luxurious Banff—in the very heart of the

Canadian Pacific Rockies

At Banff are all the fine touches of social life, good table, good service, every possible comfort at moderate cost. From the stone pillared verandah or from the wide windows of the hotel, lies spread the great panorama of Alps and river.

Reached only by the world's greatest transportation system—the

Canadian Pacific Railway

which maintains hotels at Banff, Lake Louise, Field, Glacier, Balfour.

Everything Canadian Pacific Standard—None Better.

For further information apply to
any Canadian Pacific Ticket
Agent or W. B. Howard, District
Passenger Agent, Toronto.ROBERT W. HUNT
THOS. C. IRVING JR.CHARLES WARNOCK
JAS. W. MOFFAT**Robert W. Hunt & Co., Limited****Consulting and Inspecting Engineers
Chemists and Metallurgists**

Expert examination and tests of all steel and metal products; Bridges, Buildings, Cement; Electrical and Mechanical Plant Equipment; Rails and Fastenings; Cars; Locomotives; Pipe; Castings; Forgings; Lumber; Paving Materials.

Resident inspectors at all important manufacturing centres in Canada, the United States and Great Britain.

REPORTS ON PROPERTIES AND PROCESSES.

Head Office and Laboratories:

McGill Building,

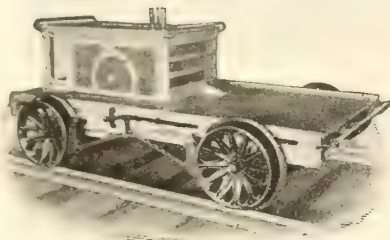
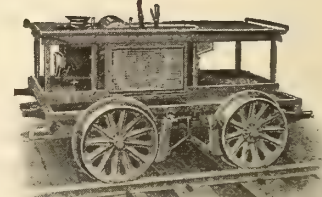
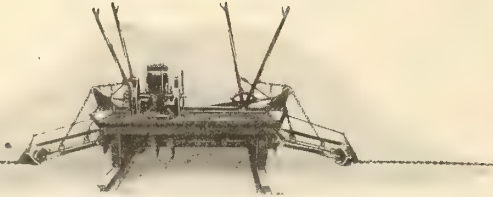
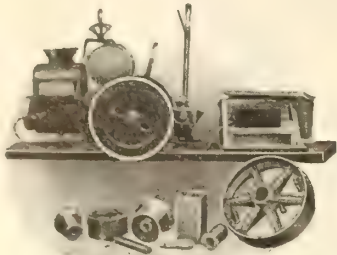
MONTREAL, QUE.

Branches: TORONTO

VANCOUVER

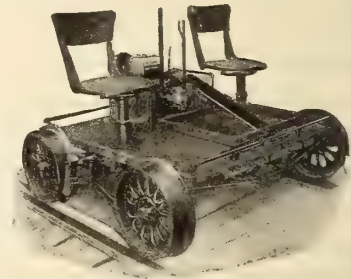
LONDON, ENGLAND

FAIRMONT WINS GOLD MEDAL



The excellence of FAIRMONT Railway Motor Cars is attested by their receiving the highest competitive award, a gold medal, at the Panama-Pacific International Exposition, San Francisco.

Years of good service on Canadian railroads has proven the justice of this award. When you need a motor car, specify "FAIRMONT". Instalment terms to private buyers.



FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

Formerly Fairmont Machine Co.

445 N. MAIN ST., FAIRMONT, MINNESOTA, U.S.A.

Flange Lubrication Should be Automatic

Flange lubrication to be efficient should be automatic, absolutely independent of your engineer, and at the same time the device itself should be so simple and yet so accurate that it will be practically trouble proof. The

Detroit Automatic Flange Lubricator (Pendulum Type)

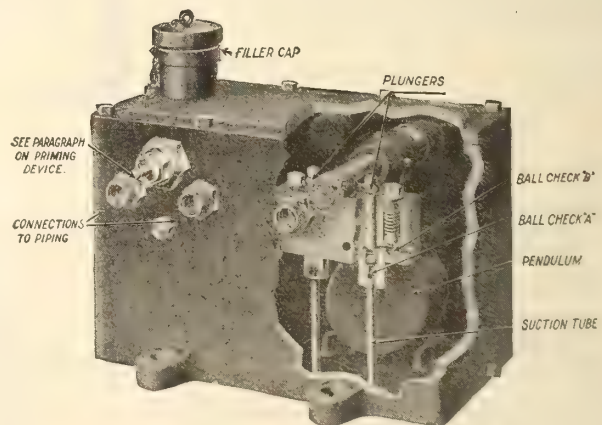
is absolutely automatic and at the same time simple. It is all in the pendulum. Any lateral movement of the locomotive causes the pendulum to swing. This oscillation rotates, rocker-like, the pendulum shaft, which produces alternating strokes of the two plungers in the pumping unit.

The use of the Detroit Automatic Flange Lubricator insures positive lubrication just when it is needed. May we send booklet F-O 81? It contains all the facts as well as drawings. Write to-day.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.

WALKERVILLE, ONT.

Canadian Sales Agents: Taylor & Arnold, Ltd., Montreal.



MONEL
METAL
Reg. U.S. Pat. Off.

NICKEL

Shot—High and low carbon.

Ingots—Two sizes, 25 lbs., 50 lbs.

Electrolytic Nickel—99.80 p.c.

Prime Metals for the Manufacture of Nickel Steel, German Silver, Anodes and all remelting purposes. Our Nickel is produced as Rods, Sheets, Strip Stock, Wire and Tubes.

We are **SOLE PRODUCERS** of this natural stronger-than-steel, non-corrodible alloy. Manufactured forms are Rods, Flats, Castings, Tubes, Sheets, Strip Stock and Wire.

Send Inquiries Direct to Us.

The International Nickel Co., 43 Exchange Place, N.Y.

It Pays to carry an advertisement in the Canadian Railway and Marine World every issue of the year because you obtain proportionately better **Results**

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies.

ACETYLENE
Commercial Acetylene Ry., Lt. & Sig. Co.

AERATED WATERS
E. L. Drewry
AIR BRAKES AND FITTINGS
Canadian Westinghouse Co.

ALES
E. L. Drewry
ANGLE BARS
Steel Co. of Canada
AUTOMOBILES
Preston Car & Coach Co.

AXLES
Nova Scotia Steel and Coal Co.
Jas. W. Pyke & Co.
Steel Co. of Canada.

BATTERIES, DRY
Canadian National Carbon Co.

BATTERIES, SIGNAL
Canadian National Carbon Co.

BATTERIES, STORAGE
Canadian National Carbon Co.

BATTERIES, TRACK
Canadian National Carbon Co.

BATTERY SUPPLIES
Canadian National Carbon Co.

BOILER COMPOUND
Dearborn Chemical Co. of Canada

BOILERS
M. Beatty & Sons
F. H. Hopkins & Co.
Polson Iron Works

BOILERS, PORTABLE
Polson Iron Works

BOILERS, STATIONARY AND MARINE
Polson Iron Works

BOILERS, STEAM
Polson Iron Works

BOILERS, WATER TUBE
Babcock & Wilcox

BOLTS AND NUTS
Steel Co. of Canada

BOLTS, TRACK
F. H. Hopkins & Co.

BORERS, CAR WHEEL
John Bertram & Sons Co.

BRAKE BEAMS
Buffalo Brake Beam Co.

BRAKE SHOES
Canada Iron Foundries

BRAKE SHOES, LOCOMOTIVE DRIVER
Canada Iron Foundries

BRIDGE BUILDERS
Terry & Tench Co.

BRIDGE NUMBERS
Acton Burrows, Limited

BRIDGES
Canadian Bridge Co.

BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION
Canadian National Carbon Co.

BUCKETS, COAL, ORE AND CONCRETE
M. Beatty & Sons

BUILDINGS, STEEL
Canadian Bridge Co.

BUMPING POSTS
F. H. Hopkins & Co.

CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED
Standard Und. Cable Co. of Can.

CARBONS, ARC LAMP, FLARE ARC AND PHOTOGRAPHIC
Canadian National Carbon Co.

CARBON SPECIALTIES
Canadian National Carbon Co.

CAR CLEANER
Allen General Supplies, Ltd.

CAR SIGNAL SYSTEMS
Ohio Brass Co.

CARS
Eastern Car Co.

CASTINGS, BRASS
Canada Iron Foundries

CASTINGS, CAR
Canada Iron Foundries

CASTINGS, IRON
Canada Iron Foundries

CASTINGS, IRON AND STEEL
Dominion Brakeshoe Co.

CASTINGS, MALLEABLE
Taylor & Arnold

CASTINGS, MANGANESE STEEL
Canadian Steel Foundries, Ltd.

CASTINGS, STEEL
Dominion Steel Foundry

CATENARY MATERIALS
Ohio Brass Co.

CHAINS
B. J. Coghlin Co.

CLOSETS, CAR
Duner Co.

COAL
Nova Scotia Steel and Coal Co.

COAL CHUTES
Roberts & Schaefer Co.

COAL DOCK BRIDGES
Roberts & Schaefer Co.

COAL MINING AND WASHING PLANTS
Roberts & Schaefer Co.

COALING STATIONS
Roberts & Schaefer Co.

COMPRESSORS, AIR
Canadian Ingersoll-Rand Co.

CONCRETE MIXERS & ROCK CRUSHERS
F. H. Hopkins & Co.

CONTRACTORS' SUPPLIES
F. H. Hopkins & Co.

CONVEYORS, COAL AND ASH
Babcock & Wilcox

COPPER, RODS AND WIRE
Standard Und. Cable Co. of Can.

COUPLERS, CAR & LOCOMOTIVE
Canada Iron Foundries, Ltd.

CRANES
Brown Hoisting Machinery Co.

CRANES, WRECKING
F. H. Hopkins & Co.

CRANES, ELECTRIC
Babcock & Wilcox

CRANES, TRAVELLING
F. H. Hopkins & Co.

CROWBARS
B. J. Coghlin Co.

CULVERTS
Pedlar People, Ltd.

CURTAINS AND FIXTURES, CAR
Du Pont Fabrikoid Co.

CUTS
Acton Burrows, Limited

DERRICKS
M. Beatty & Sons

DIES
Butterfield & Co.

DITCHERS
M. Beatty & Sons

DIVING OUTFITS
John Date

DOOR SIGNS
F. H. Hopkins & Co.

DRAFT GEAR
Standard Coupler Co.

DREDGES
M. Beatty & Sons

DRILLS
Canadian Ingersoll-Rand Co.

DRILLS, AIR
F. H. Hopkins & Co.

DRILLS, RADIAL
Canada Machinery Corporation

DRILLS, VERTICAL
Canada Machinery Corporation

DRILLS, WELL
F. H. Hopkins & Co.

DUMP CARS, CONTRACTORS'
Hart-Otis Can. Co.

DYNAMO AND ELECTRIC CASTINGS
Dominion Brakeshoe Co.

ECONOMIZERS
Babcock & Wilcox

ELECTRIC CAR ROUTE SIGNS
Acton Burrows, Limited

ENAMELED IRON SIGNS
Acton Burrows, Limited

ENGINEERS
Arnold Co.

ENGINES, AUTOMATIC
Polson Iron Works

ENGINES, HOISTING
M. Beatty & Sons

ENGINES, STATIONARY AND MARINE
Polson Iron Works

EXPRESS OFFICE SIGNS
Acton Burrows, Limited

FARE BOX HOLDERS
Coleman Fare Box Co.

FARE BOXES, P.A.Y.E. OPERATION
Coleman Fare Box Co.

FARE BOXES, PORTABLE AND STATIONARY
Coleman Fare Box Co.

FILES
Nicholson File Co.

FORGINGS
Nova Scotia Steel & Coal Co.

FROGS
Canadian Ramapo Iron Works

GAUGE COCKS
Ohio Brass Co.

GAUGES, LOCOMOTIVE
Taylor & Arnold

GEARS AND PINIONS
Allen General Supplies, Ltd.

GRATES, SHAKING
Babcock & Wilcox

HAMMERS, CAST STEEL
Dominion Brakeshoe Co.

HANDCARS
F. H. Hopkins & Co.

HANGERS, CABLE
Standard Und. Cable Co. of Can.

HEADLIGHTS
Commercial Acetylene Ry. Lt. and Sig. Co.

HEATING, CAR
Chicago Car Heating Co.

HOISTS, PNEUMATIC
Taylor & Arnold

HOISTS, STEAM
M. Beatty & Sons

HOOKS
Steel Co. of Canada

HOPPERS, CAR, WET OR DRY
Duner Co.

ILLUSTRATIONS
Acton Burrows, Limited

INSPECTIONS
R. W. Hunt & Co.

INSULATORS, PORCELAIN
Ohio Brass Co.

INSURANCE, ACCIDENT
Imperial Guar. & Acc. Ins. Co.

INTERLOCKING PLANT AND SIGNALS
Canada Steel Foundries, Ltd.

IRON AND STEEL BARS
Steel Co. of Canada

IRON SIGNS
Acton Burrows, Limited

IRON, FIG
Nova Scotia Steel and Coal Co.

JACKS
Canadian Brakeshoe Co.

JOURNAL BEARINGS
Canadian Bronze, Limited

LAGGING AND COVERING, LOCOMOTIVE
Taylor & Arnold

LAGER BEER, ETC.
E. L. Drewry

LAMPS AND LANTERNS
F. H. Hopkins & Co.

LAMPS, GAS
Commercial Acetylene Ry. Lt. and Sig. Co.

LAMPS, INCANDESCENT
Canadian Westinghouse Co.

LATHES
John Bertram & Sons Co.

LIGHTING, CAR
Commercial Acetylene Ry. Lt. and Sig. Co.

LIGHTING, SIGNAL
Commercial Acetylene Ry. Lt. and Sig. Co.

LIGHTS, CONTRACTORS' AND WRECKING
F. H. Hopkins & Co.

LINE MATERIAL
Ohio Brass Co.

LOCOMOTIVES, CONTRACTORS'
Canadian Locomotive Co.

LOCOMOTIVES, ELECTRIC
Montreal Locomotive Works

LOCOMOTIVES, LOGGING
Canadian Locomotive Co.

LOCOMOTIVES, RACK
Canadian Locomotive Co.

LOCOMOTIVES, STEAM
Canadian Locomotive Co.

LORRIES, TRACKLAYING
F. H. Hopkins & Co.

LUBRICATORS
Canadian Detroit Lubricator Co.

MACHINES AND PLANT, CONTRACTORS'
Taylor & Arnold

MACHINES, BORING AND TURNING
John Bertram & Sons Co.

MACHINES, CAR SHOP
John Bertram & Sons Co.

MACHINES, CEMENT
Jas. W. Pyke & Co.

MACHINES, DRILLING
John Bertram & Sons Co.

MACHINES, HOISTING
M. Beatty & Sons

MACHINES, HYDRAULIC
R. D. Wood & Co.

MACHINES, MILLING
John Bertram & Sons Co.

MACHINES, PLANING AND SHAPING
John Bertram & Sons Co.

MACHINES, RADIAL DRILLING
John Bertram & Sons Co.

MACHINES, RAIL DRILLING
F. H. Hopkins & Co.

MACHINES, SLOTTING
John Bertram & Sons Co.



The Marine Lubricants manufactured by the Vacuum Oil Company suit the uses they are manufactured for, better than any on the market. They are:

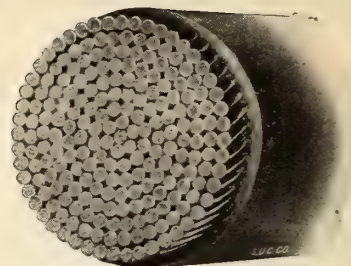
GARGOYLE MARINE ENGINE OIL No. 1
GARGOYLE CYLINDER OIL 600 W

These special marine oils are obtainable at all ports. The Imperial Oil Company, Limited, Canadian agents of Vacuum Oil Company, maintains the following special Marine Delivery Stations:

Fort William	Quebec
Halifax	Sault Ste. Marie
Hamilton	Sarnia
Kingston	St. John, N.B.
Montreal	Toronto
No. Sydney	Windsor
Ottawa	Vancouver
Owen Sound	Victoria, B. C.

**THE IMPERIAL OIL COMPANY
 LIMITED**

Canadian Agents, VACUUM OIL COMPANY



5,000,000 C. M. Weatherproof Cable
 (½ Actual Size)

Our Facilities

for the manufacture of electric wires and cables enable us to supply all kinds and sizes and in any quantity. No order is too small to merit our attention and none so large as to tax our facilities.

Write our nearest office about your requirements.

**Standard Underground Cable
 Co. of Canada, Limited**
 Hamilton, Ont.

Montreal, Que. Winnipeg, Man. Seattle, Wash.

The Preston Car & Coach Co., Limited

Preston, Ont.

Manufacturers of

Steam and Electric
 Railway Cars and
 Special Cars.

The Ottawa Car Manufacturing Co., Limited

Builders of

Electric Cars, Snow
 Sweepers and Plows

Also

Producers of Brass
 Castings of Every
 Description.

Slater Street - Ottawa

Complete Hydraulic Equipment

For Railway and Shipbuilding Plants

Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc. Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast Iron Pipe, Hydrants, Valves and Fittings, etc.

R. D. WOOD & CO. Philadelphia, Pa.

MACHINES, TRACKLAYING
F. H. Hopkins & Co.

MACHINES, WOOD AND IRON WORKING
Canada Machinery Corporation

MACHINE TOOLS
John Bertram & Sons Co.
Canada Machinery Corporation
Pratt & Whitney Co.

MANHOLE FRAMES & COVERS
Canada Iron Foundries
Dominion Brakeshoe Co.

MARINE PAINTS AND VARNISHES
Toch Bros.

MARINE REPAIRS
Goldschmidt Thermit Co.

MARINE SUPPLIES
Rice Lewis & Sons

METALS
Goldschmidt Thermit Co.

METAL WORK, STRUCTURAL
Canadian Bridge Co.
Dominion Bridge Co.
Jas. W. Pyke & Co.

MILEPOST NUMBERS
Acton Burrows, Limited

MONEL METAL
International Nickel Co.

MOTOR CARS
Fairmont Gas, Eng. and Ry.
Motor Car Co.

MOTORS, TURNABLE
Taylor & Arnold

NAILS, CUT AND WIRE
Steel Co. of Canada

NICKEL, SHEET, ROD, WIRE & TUBE
International Nickel Co.

NICKEL, METALLIC SHOT & INGOTS
International Nickel Co.

NUMBERS
Acton Burrows, Limited

NUT LOCKS
Positive Lock Washer Co.

OFFICE FITTINGS
Can. Office & School Furn. Co.

OFFICE SIGNS
Acton Burrows, Limited

OILS
Galena-Signal Oil Co.

PACKING
Garlock Packing Co.

PAINTS
Toch Bros.

PATENT ATTORNEYS
H. J. S. Dennison
H. C. Shipman & Co.
Van Hallen & O'Neil

PILE DRIVERS, RAILWAY
F. H. Hopkins & Co.

PIPE, STEAM
Babcock & Wilcox

PIPE STOCKS
Butterfield & Co.

PIPE, WROUGHT, LEAD AND GALVANIZED
Steel Co. of Canada

PLANERS
John Bertram & Sons Co.
Canada Machinery Corporation

PLATFORMS, STEEL
Standard Coupler Co.

PLOUGHS, CONTRACTORS'
F. H. Hopkins & Co.

PORTER
E. L. Drewry

PUMPS
F. H. Hopkins & Co.

PUMPS, CENTRIFUGAL
M. Beatty & Sons
F. H. Hopkins & Co.
R. D. Wood & Co.

PUNCHES AND SHEARS
Canada Machinery Corporation

PUTTY
Steel Co. of Canada

RAIL BONDS
Ohio Brass Co.
Elec. Railway Improvement Co.

RAIL BENDERS
Canadian Steel Foundries, Ltd.

RAIL JOINTS
Goldschmidt Thermit Co.
The Rail Joint Co. of Canada

RAILS, NEW
Algoma Steel Corporation
Dominion Iron & Steel Co.
J. J. Gartshore
F. H. Hopkins & Co.

RAILS FOR RELAYING
J. J. Gartshore
Jas. W. Pyke & Co.

RAILWAY SUPPLIES
Franklin Railway Supply Co.
F. H. Hopkins & Co.
Rice Lewis & Sons
The Hiram L. Piper Co.

REAMERS
Butterfield & Co.

REPLACERS, CAR AND LOCOMOTIVE
F. H. Hopkins & Co.

RIVETS
Steel Co. of Canada, Ltd.

RIVETTERS
Canadian Ingersoll-Rand Co.

ROCK CRUSHERS
F. H. Hopkins & Co.

ROPE, DERRICK
Dominion Wire Rope Co.

ROOFING, CAR
Franklin Railway Supply Co.
F. H. Hopkins & Co.

RUBBER GOODS
Can. Consolidated Rubber Co.

SANDERS, PNEUMATIC
Ohio Brass Co.

SAWS, HACK
Diamond Saw & Stamping Co.

SCOWS, DUMP AND DECK
M. Beatty & Sons

SCREW PLATES
Butterfield & Co.

SCRAPERS, WHEEL AND DRAG
F. H. Hopkins & Co.

SCREWS, WOOD AND MACHINE
John Morrow Screw and Nut Co.
Steel Co. of Canada

SEMAPHORE ARMS
Acton Burrows, Limited

SHEET PILE DRIVERS
Canadian Ingersoll-Rand Co.

SHIPS
Polson Iron Works

SIGNAL HOUSE NUMBERS
Acton Burrows, Limited

SIGNALS
Gen. Railway Signal Co. of Can.
The Hiram L. Piper Co.

SIGNS
Acton Burrows, Limited

SNOW PLOUGHS
F. H. Hopkins & Co.

SPIKES, RAILWAY, SHIP OR PRESSED
Nova Scotia Steel and Coal Co.
Steel Co. of Canada

SPLICING TUBES AND COMPOUNDS
Standard Und. Cable Co. of Can.

SPREADER CARS
F. H. Hopkins & Co.

SPRINGS
Canadian Steel Foundries, Ltd.
B. J. Coghlin & Co.

SPRINKLERS, ELECTRIC
Preston Car & Coach Co.

STAPLES
Steel Co. of Canada

STATION NAME SIGNS
Acton Burrows, Limited

STAYBOLT IRON
Taylor & Arnold
Trolley Supply Co.

STAYBOLTS, FLEXIBLE
Flannery Bolt Co.

STAYBOLTS, LOCOMOTIVE
Flannery Bolt Co.

STAYBOLT TAPS
Butterfield & Co.

STEAM HAMMERS
John Bertram & Sons Co.

STEAM SHOVELS
M. Beatty & Sons
F. H. Hopkins & Co.

STEAMSHIP SIGNS
Acton Burrows, Limited

STEEL
Nova Scotia Steel and Coal Co.

STEEL, FIRE BOX
Taylor & Arnold
Canadian Steel Foundries, Ltd.

STEEL FOR AXES
Canadian Steel Foundries, Ltd.

STEEL FOR SAWS
Canadian Steel Foundries, Ltd.

STEEL FOR TIRES
Steel Co. of Canada

STEEL SHAFTING
Nova Scotia Steel and Coal Co.

STEEL PLATES
Jas. W. Pyke & Co.

STEEL, TOOL
Canadian Steel Foundries, Ltd.
F. H. Hopkins & Co.

STOKERS, MECHANICAL
Babcock & Wilcox

STRAINERS
Babcock & Wilcox

SUPERHEATERS
Babcock & Wilcox
Locomotive Superheater Co.

SWITCH TARGETS
Acton Burrows, Limited

SWITCHES
Canadian Ramapo Iron Works

TACKS
Steel Co. of Canada

TANKS AND TANK FIXTURES
F. H. Hopkins & Co.
Polson Iron Works

TANKS, PORTABLE ACETYLENE, WELDING
Commercial Acetylene Ry. Lt. and Sig. Co.

TAPS
Butterfield & Co.

TELEGRAPH AND TELEPHONE OFFICE SIGNS
Acton Burrows, Limited

TERMINALS, JUNCTION BOXES
Standard Und. Cable Co. of Can.

THERMIT
Goldschmidt Thermit Co.

TIE PLATES
Algoma Steel Corporation
B. J. Coghlin
Nova Scotia Steel & Coal Co.
Steel Co. of Canada

TICKET CASES
Canadian Office & School Fur. Co.

TIRES, STEEL
Jas. W. Pyke & Co.

TOOLS AND SUPPLIES
F. H. Hopkins & Co.
Pratt & Whitney Co.

TOOLS, CAST STEEL
Dominion Brakeshoe Co.

TOOLS, TRACK
John Bertram & Sons Co.
Canadian Steel Foundries, Ltd.
B. J. Coghlin Co.
F. H. Hopkins & Co.

TOOLS, PNEUMATIC
Canadian Ingersoll-Rand Co.
Independent Pneumatic Tool Co.

TRAMWAY EQUIPMENT
J. J. Gartshore

TRACK EQUIPMENT
Canadian Ramapo Iron Works
F. H. Hopkins & Co.

TROLLEY BASES
Allen General Supplies, Ltd.
Ohio Brass Co.

TROLLEY CATCHERS
Allen General Supplies, Ltd.
Ohio Brass Co.

TROLLEY GUARDS
Ohio Brass Co.
Trolley Supply Co.

TROLLEY RETRIEVERS
Allen General Supplies, Ltd.
Ohio Brass Co.
Trolley Supply Co.

TROLLEY WHEELS
Star Brass Works

TRUCKS, ELECTRIC CAR
Canadian Steel Foundries, Ltd.

TRUSSES, ROOF
Canadian Bridge Co.
Dominion Bridge Co.

TUBES, BOILER
F. H. Hopkins & Co.

TUBE CLEANERS
F. H. Hopkins & Co.

TURNBUCKLES
Canadian Steel Foundries, Ltd.

TURNABLES
Canadian Bridge Co.
Dominion Bridge Co.

UPHOLSTERY, CAR
Du Pont Fabrikoid Co.

VALVES
Canadian Detroit Lubricator Co.
R. D. Wood & Co.

VALVES, ANGLE AND GLOBE
Ohio Brass Co.

VALVES, BRASS GATE
Ohio Brass Co.

VALVES, LOCOMOTIVE POP
Taylor & Arnold

VARNISHES
Berry Bros.

VENTILATORS, CAR
Automatic Ventilator Co.

VESELS
Polson Iron Works

WASHERS
Steel Co. of Canada

WASTE
B. J. Coghlin Co.

WATER SOFTENERS & PURIFIERS
Babcock & Wilcox
Dearborn Chemical Co. of Can.

WELDING
Goldschmidt Thermit Co.

WHEELBARROWS
F. H. Hopkins & Co.

WHEEL GRINDERS
Griffin and Brinkerhoff

WHEELS, CAR
Association of Manufacturers of Chilled Car Wheels
Canada Iron Foundries
Jas. W. Pyke & Co.

WHEELS, LOCOMOTIVE
Canada Iron Foundries

WHITE LEAD
Steel Co. of Canada

WIRE AND WIRE ROPE
Dominion Wire Rope Co.

WIRE, BARE COPPER
Standard Und. Cable Co. of Can.
Steel Co. of Canada

WIRE, BRASS, IRON AND STEEL
Steel Co. of Canada

WIRE, INSULATED COPPER
Standard Und. Cable Co. of Can.
Steel Co. of Canada

WIRE GOODS, BRIGHT
Steel Co. of Canada

WIRE, TELEGRAPH AND TELEPHONE
Standard Und. Cable Co. of Can.
Steel Co. of Canada

WIRE, TRANSMISSION AND TROLLEY
Standard Und. Cable Co. of Can.

WRENCHES, CAST STEEL
Dominion Brakeshoe Co.

YACHTS
Polson Iron Works

The Canadian Bridge Co., Limited

Walkerville, Ontario

Locomotive
Turntables
Roofs
Steel Buildings

Manufacturers of
Railway and Highway
BRIDGES

Structural
Iron Work
of all
Descriptions

Alphabetical List of Advertisers

A		M	
Algoma Steel Corporation.....	25	Montreal Locomotive Works.....	17
Allen General Supplies, Ltd.....	78	Morrow, John Screw & Nut Co....	78
Arnold Co.	79	N	
Association of Manufacturers of Chilled Car Wheels.....	9	National Steel Car Co.....	86
Automatic Ventilator Co.....	24	Nicholson File Co.....	16
B		Norton, A. O., Inc.....	18
Babcock & Wilcox.....	21	Northern Electric Co.....	77
Beatty, M. & Sons, Co.....	78	Nova Scotia Steel & Coal Co....	7
Berry Bros.....	14	O	
Bertram, John & Sons, Co.....	1	Ohio Brass Co.....	13
Bradstreet Company.....	77	Ottawa Car Manufacturing Co.....	82
Brown Hoisting Machinery Co....	85	P	
Buffalo Brake Beam Co.	20	Pedlar People, Ltd.....	18
Burrows—Acton Burrows, Ltd....	74	Piper, The Hiram L., Co.....	77
Butterfield & Co.....	75	Polson Iron Works.....	76
C		Positive Lock Washer Co.....	76
Canada Iron Foundries, Ltd.....	21	Pratt & Whitney Co. of Canada..	25
Canada Machinery Corporation..	3	Preston Car and Coach Co.....	82
Canada Steamship Lines, Ltd.....	71	Pyke, J. W. & Co.....	73
Canadian Brakeshoe Co.....	71	R	
Canadian Bridge Co.....	83	Rail Joint Co. of Canada.....	22
Canadian Bronze, Ltd.....	77	Roberts & Schaefer Co.....	79
Canadian Consolidated Rubber Co.	26	S	
Canadian Detroit Lubricator Co.	80	Shipman, Harold C., & Co.....	79
Canadian Fairbanks-Morse Co....	19	Sinclair, Angus.....	79
Canadian Government Railways..	20	Standard Coupler Co.....	76
Canadian Ingersoll-Rand Co.....	17	Standard Underground Cable Co.	82
Canadian Locomotive Co.....	16	of Canada.....	82
Canadian Marconi Co.....	72	Star Brass Works.....	21
Canadian National Carbon Co....	23	Steel Co. of Canada.....	4
Canadian Northern Railway.....	15	T	
Canadian Office & School Furni- ture Co.....	71	Taylor & Arnold.....	73
Canadian Pacific Railway.....	79	Terry & Tench Co.....	79
Canadian Ramapo Iron Works....	72	Toch Bros.....	74
Canadian Steel Foundries, Ltd....	13	Trolley Supply Co.....	25
Canadian Westinghouse Co.....	2	V	
Chicago Car Heating Co.....	84	Van Hallen & O'Neil.....	79
Coghlin, B. J., Co.....	22	W	
Commercial Acetylene Ry., Light & Signal Co.....	73	Wood, R. D., & Co.....	82
Consolidated Car Heating Co.....	76	*Advertisements marked with an asterisk appear in alternate issues.	
D		L	
Date, John.....	77	Lewis, Rice & Son.....	22
Dearborn Chemical Co. of Canada	15	Locomotive Superheater Co.....	24
Dennison, H. J. S.	79	E	
F		Eastern Car Co.....	8
Fairmont Gas Engine & Ry. Mo- tor Car Co.....	80	Electric Railway Improvement Co.	23
Flannery Bolt Co.	2	F	
Franklin Railway Supply Co.....	19	Fairmont Gas Engine & Ry. Mo- tor Car Co.....	80
G		Flannery Bolt Co.	2
Galena-Signal Oil Co.....	6	Franklin Railway Supply Co.....	19
Garlock Packing Co.....	12	G	
Gartshore, J. J.....	77	Galena-Signal Oil Co.....	6
General Ry. Signal Co. of Canada	5	Garlock Packing Co.....	12
Goldschmidt Thermit Co.	10	Gartshore, J. J.....	77
Grand Trunk Railway.....	12	General Ry. Signal Co. of Canada	5
Griffin & Brinkerhoff.....	76	Goldschmidt Thermit Co.	10
H		Grand Trunk Railway.....	12
Hart-Otis Car Co.	11	Griffin & Brinkerhoff.....	76
Hopkins, F. H. & Co.....	11	H	
Hunt, Robert W. & Co.....	79	Hart-Otis Car Co.	11
Hunt-Spiller Mfg. Corporation....	78	Hopkins, F. H. & Co.....	11
I		Hunt, Robert W. & Co.....	79
Imperial Bank of Canada.....	78	Hunt-Spiller Mfg. Corporation....	78
*Imperial Guar. & Acc. Ins. Co.	84	I	
Imperial Oil Co.....	83	Imperial Bank of Canada.....	78
Independent Pneumatic Tool Co.	20	*Imperial Guar. & Acc. Ins. Co.	84
International Correspond. Schools	75	Imperial Oil Co.....	83
International Nickel Co.....	80	Independent Pneumatic Tool Co.	20
J		International Correspond. Schools	75
Jacobs & Davies.....	79	International Nickel Co.....	80
L		J	
Lewis, Rice & Son.....	22	Jacobs & Davies.....	79
Locomotive Superheater Co.....	24	L	
Diamond Saw & Stamping Works		Lewis, Rice & Son.....	22
Dominion Brakeshoe Co.		Locomotive Superheater Co.....	24
Dominion Bridge Co.....		Diamond Saw & Stamping Works	
Dominion Iron & Steel Co.....		Dominion Brakeshoe Co.	
Dominion Iron & Wrecking Co....		Dominion Bridge Co.....	
Dominion Steel Foundry Co....		Dominion Iron & Steel Co.....	
Dominion Wire Rope Co.....		Dominion Iron & Wrecking Co....	
Drewry, E. L., Ltd.....		Dominion Steel Foundry Co....	
Duner Co.....		Dominion Wire Rope Co.....	
Du Pont Fabrikoid Co.....		Drewry, E. L., Ltd.....	

The Imperial Guarantee and Accident Insurance Co. of Canada

Imperial Protection Accident and Sickness Insurance
Guarantee Bonds Plate Glass and Automobile Insurance

A Strong Canadian Company

Head Office, 44 King St. W., Toronto, Ont.

Branch Offices:

Montreal, Que., Canada Life Bldg. Winnipeg, Man., Merchants Bank Bldg. Calgary, Alta., Canada Life Bldg. Vancouver, B.C., 546 Pender St. W.

CHICAGO CAR HEATING CO.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES

Canadian Factory and Office—61 Dalhousie St., Montreal A. D. BRUCE, Agent

GENERAL OFFICES:
RAILWAY EXCHANGE, CHICAGO, U.S.A.
NEW YORK, GRAND CENTRAL TERMINAL BLDG.
ATLANTA GA., CANDLER BLDG.
WASHINGTON, D.C., MUNSEY BLDG.

BROWNHOIST Locomotive Crane

A Big Labor Saver
on all Kinds of
Construction Work

was used in renewing the railroad bridge over Gauley River at Gauley Bridge, W. Va. The crane was used for unloading the new steel members as they were received, erecting the false work, dismantling the old bridge, erecting all steel except two 56-ft. deck plate girder spans, switching cars, and clearing the bridge for 4 train movements each way each 10-hr. day. The crane placed about 35 per cent. more steel per day than would have been possible with a traveler. The Kanawha & Michigan R. R. did the work under the direction of C. M. McVay and Paul Eberst.

It is very important that a good crane be used on such work, otherwise expensive delays may result, due to breakdowns. No risk is taken in using a Brownhoist Crane—25 years' records prove it to be a well-built machine. Ask the owners—they will tell you.

A new catalog is ready, which shows how and where this crane is used. Write for a copy of this Catalog I.

The Brown Hoisting Machinery Co.

Cleveland, Ohio

MONTREAL OFFICE, 145 St. James Street





National Railroad Equipment

Designed, Built and Equipped in our Own Plant

All Steel Sleeping Cars, Freight Cars, First-class Passenger Coaches, Oil Tank Cars, Contractors Dump Cars, Underframes, "Damascus" Brake Beams, Flat Cars, National Motor Trucks for light and heavy duty, Railroad Equipment of Special Design built to Order.

Correspondence Invited

National Steel Car Company, Limited

Montreal Office :
SHAUGHNESSY BUILDING

Works and Operating Offices :
HAMILTON, CANADA

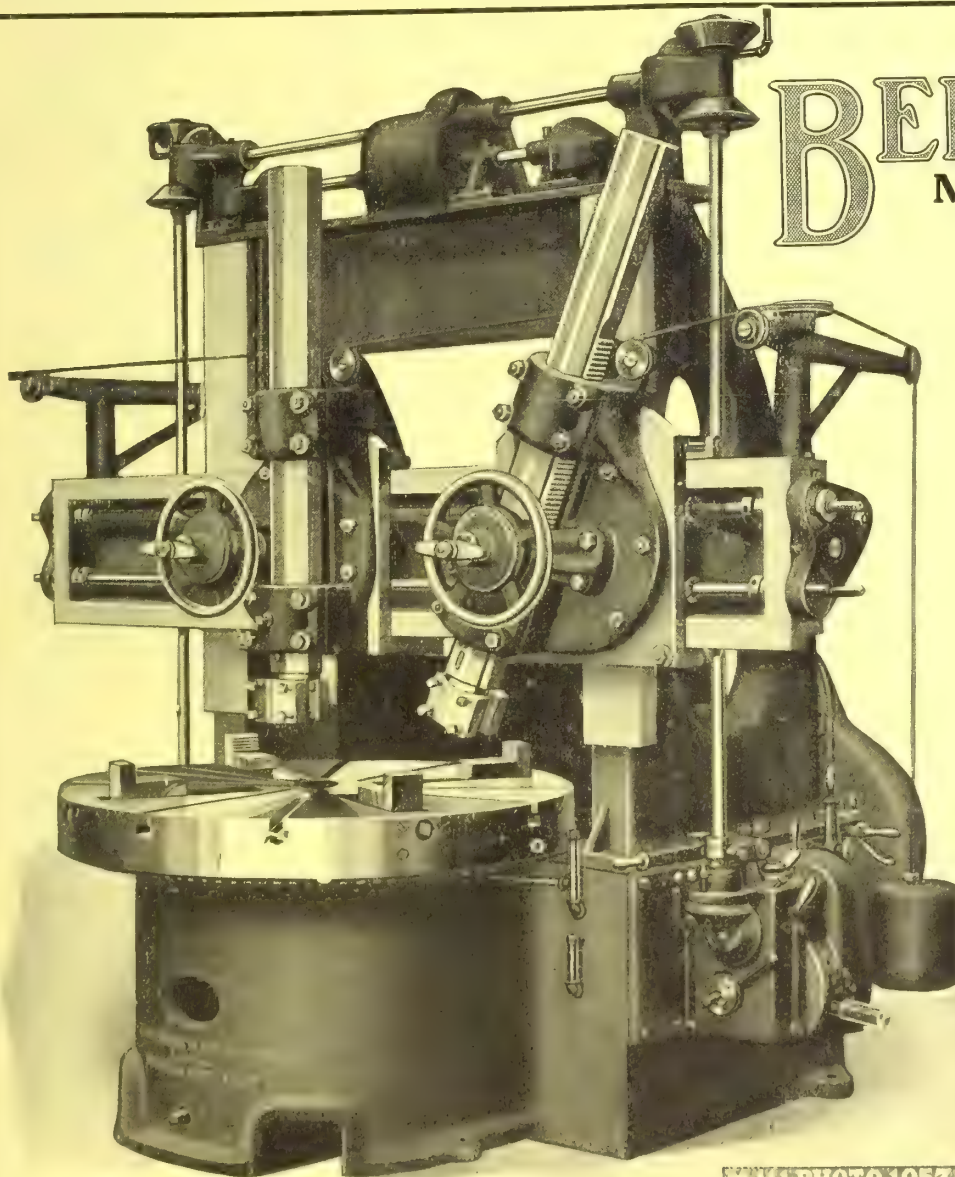
Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 223

TORONTO, CANADA, SEPTEMBER, 1916

Subscription Rates, Page 369



BERTRAM

MACHINE
TOOLS

**42-inch
Vertical
Boring
and
Turning
Mill**

*Niles
Type*

Motor-driven through
speed box.

Built in sizes from 42-
inch to 100-inch swing.

Drop us a line for Pho-
tographs and full par-
ticulars.

WILL PHOTO 1057

Locomotive and Car Shop Equipment.

The John Bertram & Sons Co., Limited

Dundas, Ontario, Canada

VANCOUVER

609 Bank of Ottawa Bldg.

MONTREAL

723 Drummond Bldg.

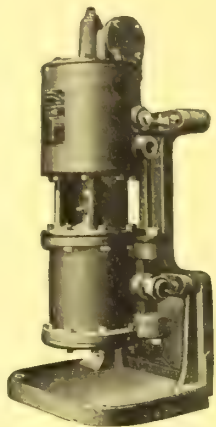
WINNIPEG

1205 McArthur Bldg.

Westinghouse

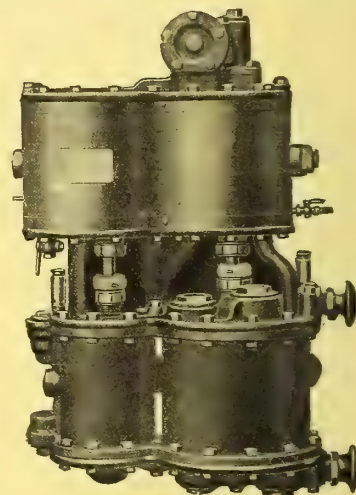
Single-Stage and Cross-Compound Air Compressors

Simple and Reliable



Westinghouse Single-Stage Compressor on Portable Stand

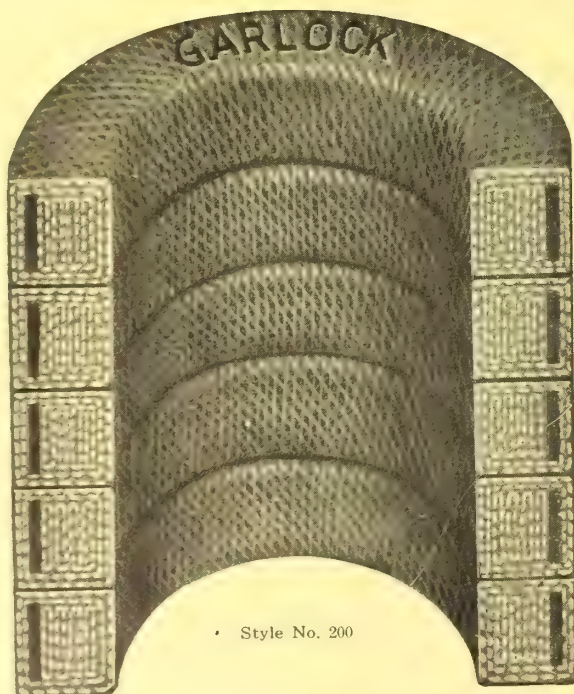
They occupy the smallest possible space, yet are designed with ample proportion of all wearing parts, insuring durability and low maintenance cost. They can be mounted on a boiler, or to any post, column or wall, or a stand is provided making it easy to move the compressor about. They are the same compressors recognized as standards for railway air-brake systems.



Westinghouse Cross-Compound Compressor.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

TORONTO, Traders Bank Bldg. MONTREAL, 52 Victoria Sq. OTTAWA, Ahearn & Soper, Ltd. HALIFAX, 105 Hollis St. FT. WILLIAM, Telfer Bldg.
WINNIPEG, 158 Portage Ave. E. CALGARY, Grain Exchange Bldg. VANCOUVER, Bank of Ottawa Bldg.



Style No. 200

Garlock High Pressure Piston Rod Packing

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.

THE GARLOCK PACKING COMPANY

Hamilton, Ontario



Branches :

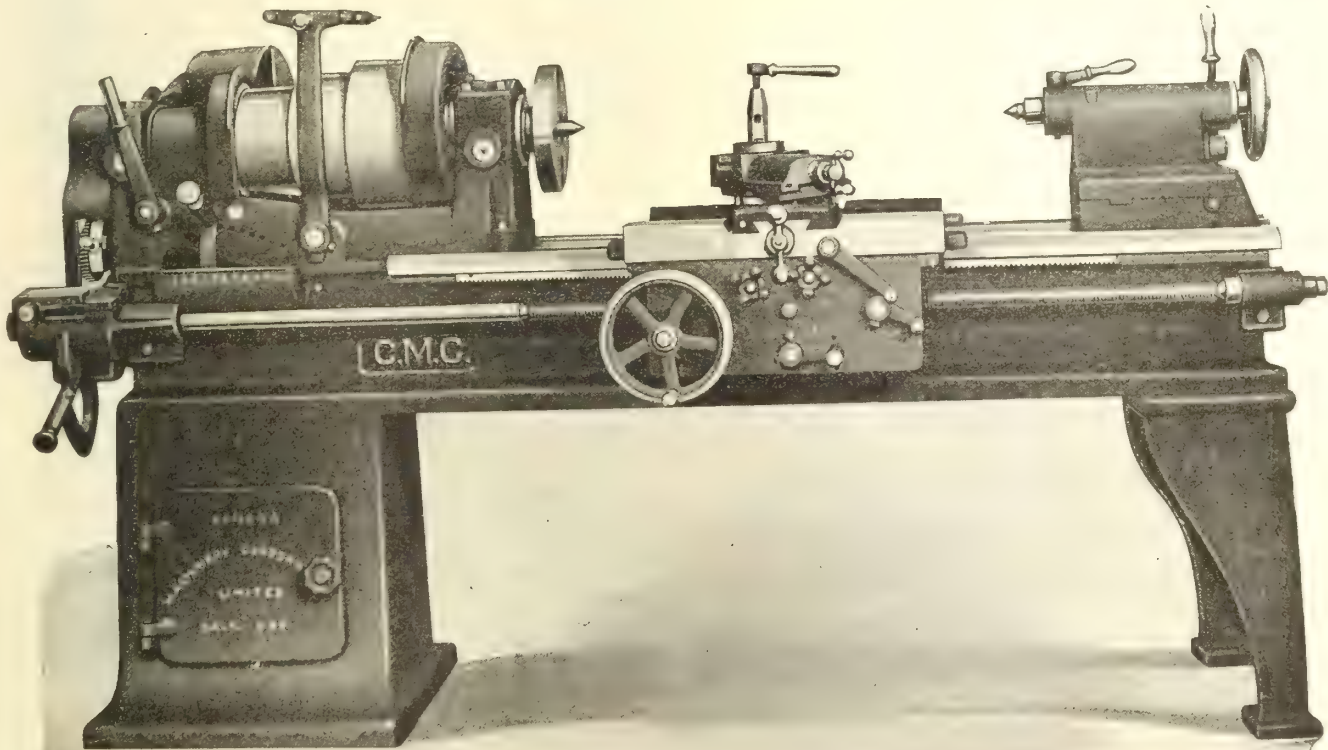
Montreal, Que., 342 St. James St. East Toronto, Ont., Continental Life Bldg.
Winnipeg, Man., Galt Building



MACHINE **C.M.C.** TOOLS

Engine Lathe with Quick Change Gears

Sizes 16" and 18"



We manufacture a very complete range of Lathes in sizes from 14 inch swing to 42 inch, and any length of bed desired. Our small sizes we can equip with Relieving Attachment,

Draw-in Chuck and Collet and Taper Attachments for Tool Room purposes, and all sizes can be equipped with Turrets, either on bed or cross slide; pump, pan and piping if so desired.

For convenience of the trade we have opened show-rooms in Toronto, at Brock Avenue Subway, where a full line of our machinery can be inspected.

CANADA MACHINERY CORPORATION

LIMITED

GALT, ONTARIO

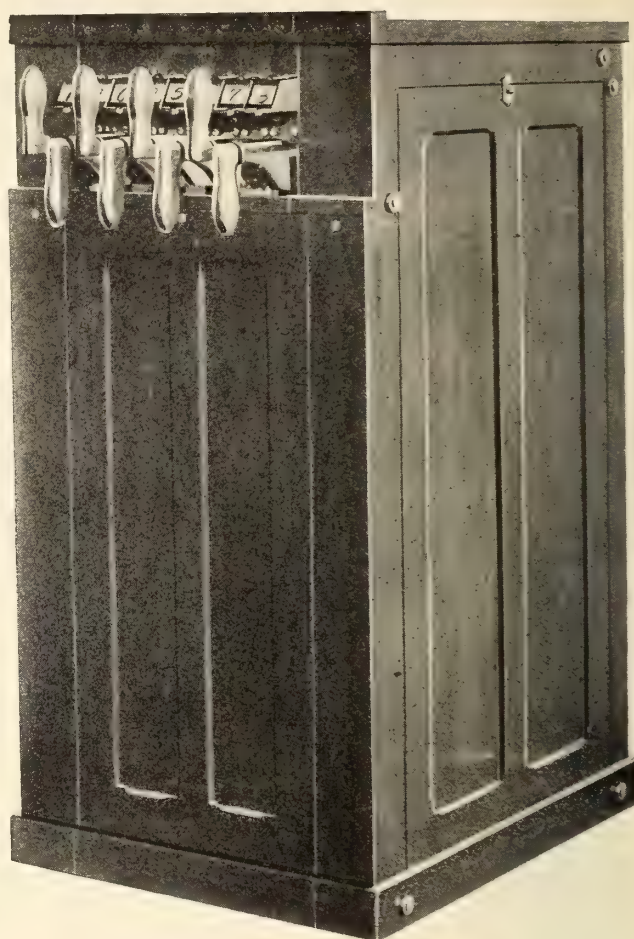
Builders of Wood and Iron Working Machine Tools.

Capitalize Your Crossing Delays

THE G-R-S- Electric Interlocking Machine, due to its ease of operation, its safety made possible by dynamic indication and its reliable system of cross protection, is exactly suited to small crossing installations where it can be operated by the station agent or other attendant without interfering with his regular duties, thereby eliminating one of the principal items in the annual operating cost of an interlocking plant.

Stopping for the unprotected crossing not only means delay, but a cost of from fifty cents to one dollar or more per stop.

The elimination of a few train-stops per day, together with the elimination of the lever-man's wages alone are sufficient to show a profit on an installation of G-R-S Electric Interlocking.



When you can capitalize your crossing delays by means of their elimination, show an annual saving and an improvement in present train service, is it not time to install a small G-R-S Electric Interlocking Plant?



"Safety First"
GENERAL RAILWAY SIGNAL COMPANY
OF CANADA LIMITED



Office and Works, Lachine, Quebec

Branch Office, Winnipeg, Manitoba

Galena-Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office — 603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil

in Headlights, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and Correspondence Solicited.

S. A. MEGEATH,
PRESIDENT.

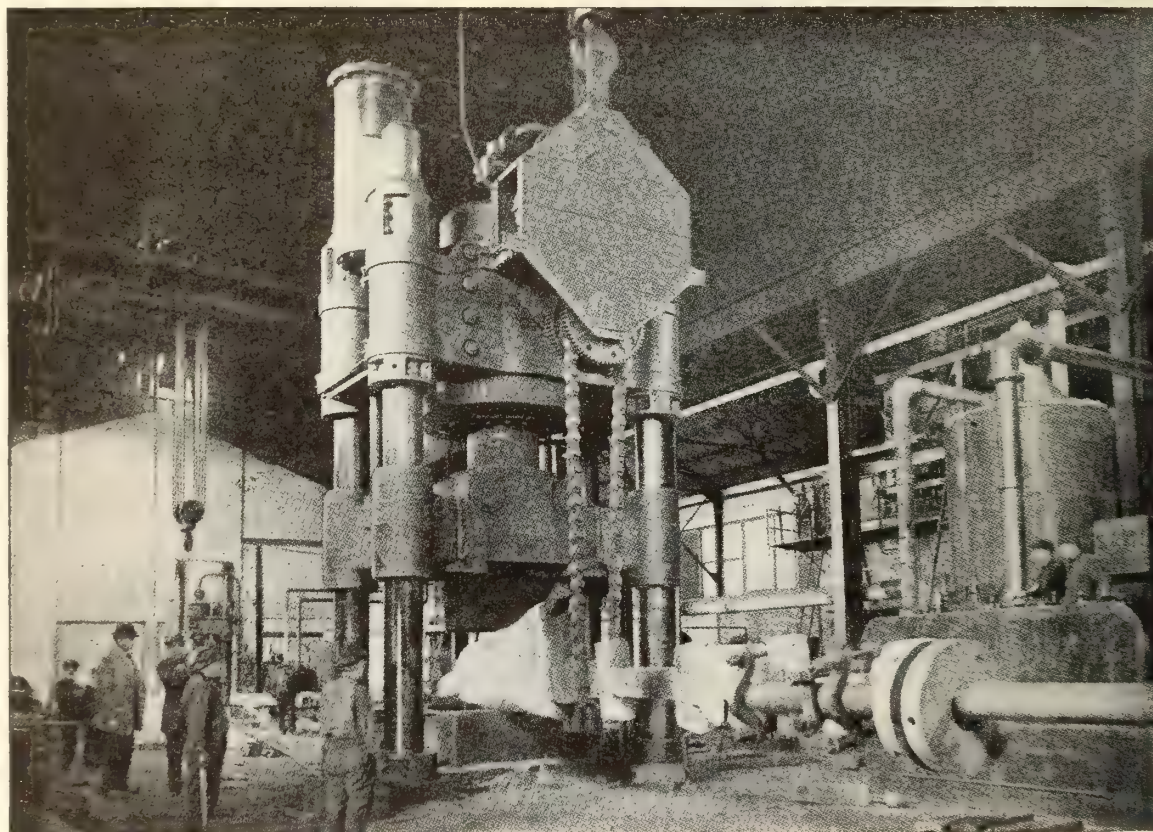
Nova Scotia Steel & Coal Company

LIMITED

Manufacturers of Steel for Shrapnel Shells and Admiralty Forgings

Only Company in Canada producing Steel Ingots by the "Harmet" liquid process

Can supply Forgings up to 40 Tons in weight to all Admiralty and Lloyd's Tests and Specifications



FORGING A RUDDER FRAME

Why "Harmet" Liquid Process Steel Ingots are Superior to Ordinary Steel Ingots:—

1. Prevention of cracks due to shrinkage; of internal stresses and resulting cracks and fissures.
2. Early cessation in the crystallization of the metal, and the production of fine crystallization without cleavage planes.
3. Lessening of segregation, i.e., reduction of tendency of carbon and other impurities to concentrate in the central and upper parts of the ingot.
4. Prevention of "pipes" or interior cavities, and thus preservation of absolute solidity in the ingot.
5. Improvement in physical properties.
6. Reduction in waste of ingot.

OUR modern Steam Hydraulic Forge Shop at New Glasgow, N.S., part of which is shown above, and our large Steel Plant at Sydney Mines, N.S., equal the very best in America.

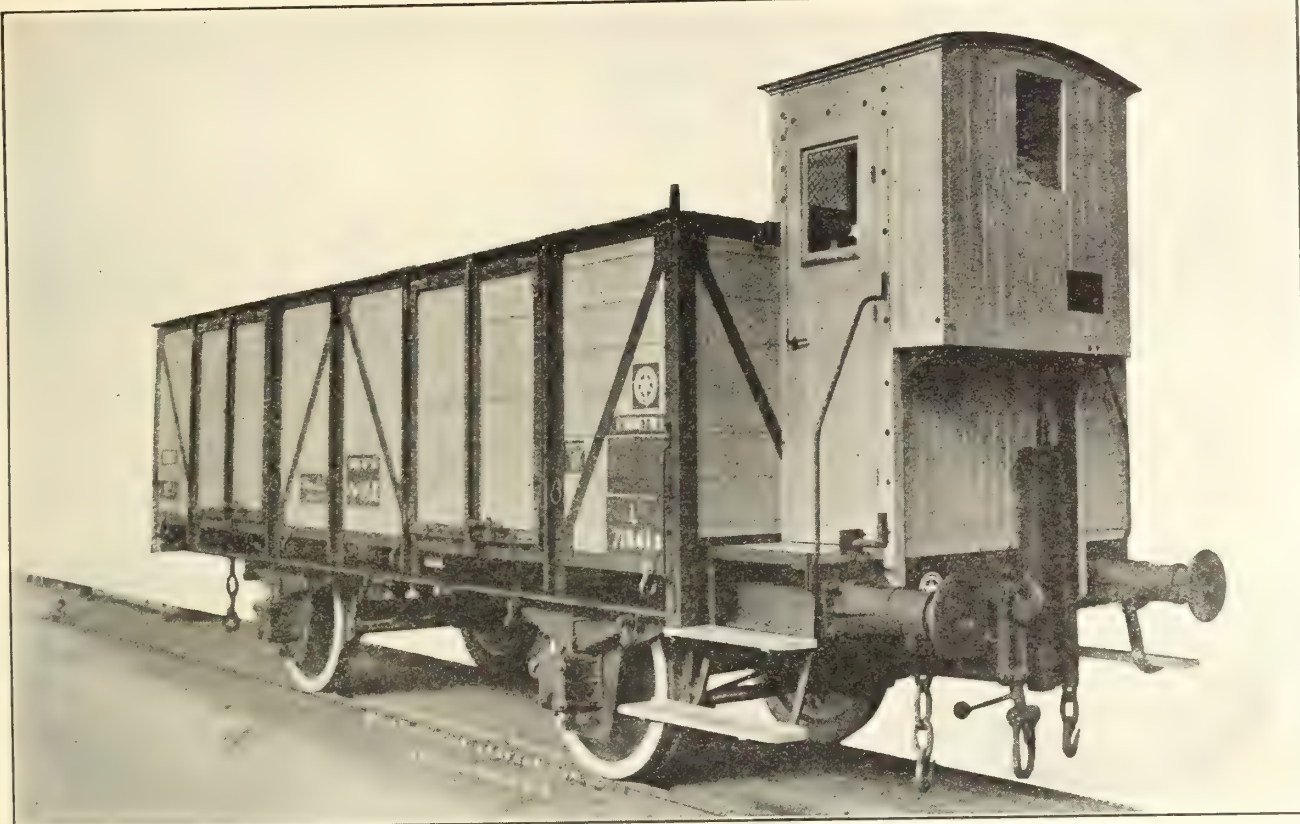
On the shortest notice, we can supply forgings of all shapes and sizes, made of ordinary or "Harmet" fluid compressed open-hearth steel, and satisfying the most severe specifications.

Our forges are modern in every respect—designed and installed after close study of the latest developments in all countries. Moreover, we produce the highest grades of steel by the most approved methods. It has always been the policy of "Scotia" to hold a position in the front rank of trade, and by the recent additions to plant, this policy has been maintained in a practical manner, bringing "Scotia's" equipment abreast of the best foreign forges.

For prices and full particulars, write to

Head Office, NEW GLASGOW, N.S.

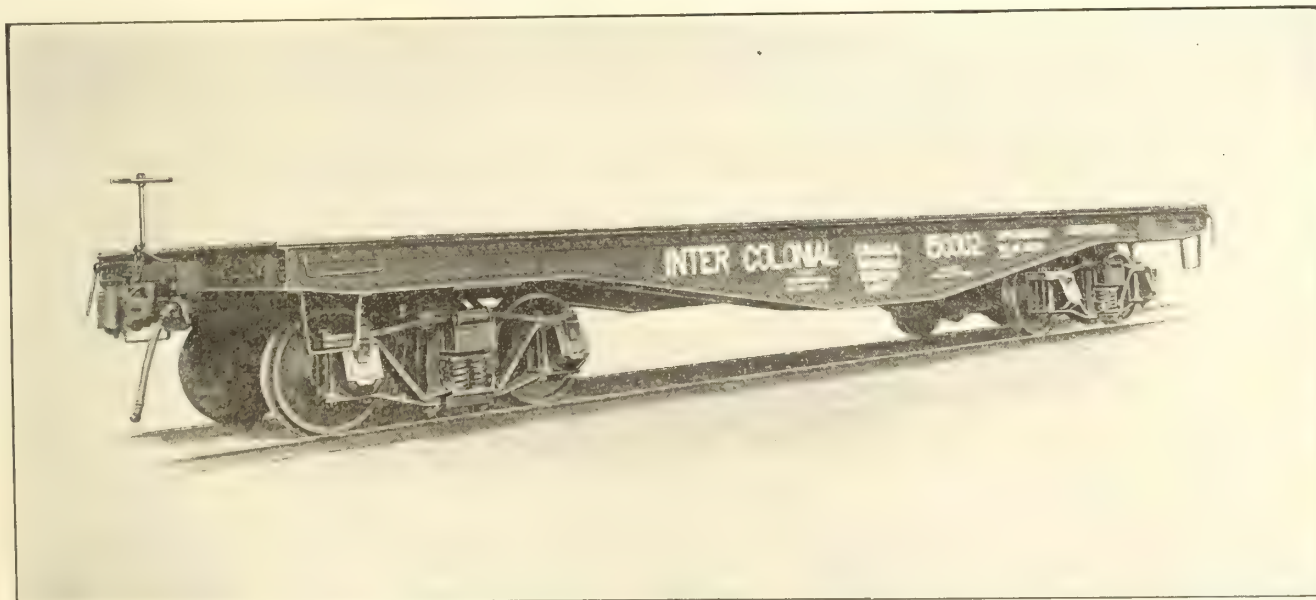
Western Sales Office, Room 14, Windsor Hotel, Montreal



ONE OF 2,000 GONDOLA CARS NOW UNDER CONSTRUCTION FOR THE FRENCH GOVERNMENT.

FREIGHT CARS TO FOREIGN ORDER

We have unexcelled water and rail shipping facilities for the export of freight cars of all types abroad or to United States markets. Our manufacturing capacity reaches to 40 cars per day. Although fully employed in filling and conducting negotiations for further foreign orders, our exceptional output facilities enable us both to take care of these and others in the order in which they are received.



75 TON SPECIAL PIT CAR FOR CANADIAN GOVERNMENT RAILWAYS.

FLAT CARS, CABOOSES, AND MINE CARS

We make a specialty of Flat Cars, Caboosees and Mine Cars for both Home and Foreign Markets in Wood, Steel Frame or "All-Steel" and shall be pleased to quote against all capacity requirements and quantities.

Eastern Car Company, Limited

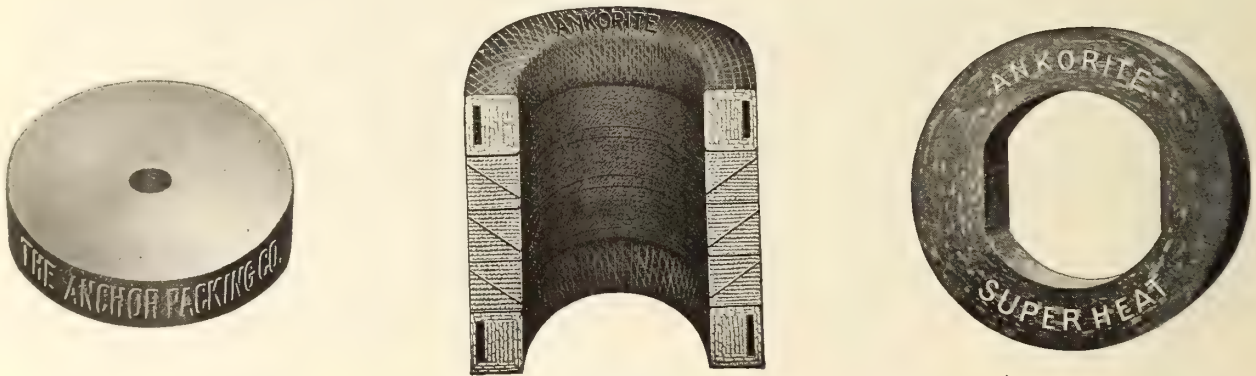
General Offices and Works, New Glasgow, N.S.

Montreal Office, Room 14 Windsor Hotel

3

Anchor Packings

Worth Trying



We Have Others

“The Proof of the Pudding is in
the Eating Thereof”

GIVE US A TRIAL

CANUCK SUPPLY CO.

LIMITED

Montreal
Que.

Toronto
Ont.

Winnipeg
Man.

Vancouver
B.C.



THE REASON THAT OUR WIRE ROPES

are paramount is due to our manufacturing experience, large scale production, manufacturing facilities, and ideals of quality.

"Made in Canada" and stocks carried at Montreal, Winnipeg and St. Catharines

The Dominion Wire Rope Company, Limited

General Service Cars

Otis Dump Cars

— PATENTED —

Built in Any Size
or Capacity

All Steel, Wood or
Composite



For Standard or
Special Service

Thousands in Use

The Standard Coal Car on Canada's Leading Railroads.

Designed and Built by

The HART-OTIS CAR CO., Limited, MONTREAL

—Sole Patentees for General Service Cars for Canada—



"H & E" Ball and Cone Bearing Lifting Jacks

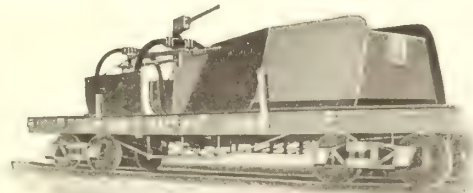
Are the Fastest Jacks Made

"MARION" Ballast Unloaders

Constructed entirely of Steel.

They work as well in Dumping
Boulders or Ballast Rock as in
Clay, Loam, Gravel and Crushed Stone.

May be used on ordinary Flat Cars.



Branch:
St. Catharines, Ont.

F. H. Hopkins & Co

Head Office:
MONTREAL



The Land of Fishing Thrills

A Sportsman's Paradise where the cool waters of **Wild, Unspoiled Lakes and Rivers** give the Salmon and Speckled Trout and gamy Black Bass fighting qualities to delight the most ardent angler, making

Algonquin Park (Ontario)



NOMINIGAN CAMP, ALGONQUIN PROVINCIAL PARK

a vacation territory to dream about. It offers canoe trips through myriads of waterways, with ideal camping grounds among forests of pines and balsams.

2,000 Feet Above the Sea

Fine accomodation for those who love the social side of resort life can be had at Highland Inn at Algonquin Park Station, or in the novel and comfortable Log Cabin Camps Nominigan and Minnesing.

Handsomely Illustrated advertising matter and full information supplied free on application to C. E. HORNING, Union Station, Toronto, or to J. QUINLAN, Bonaventure Station, Montreal.

CANADIAN STEEL FOUNDRIES LIMITED

STEEL CASTINGS - MANGANESE STEEL CASTINGS
GRAY IRON AND SEMI STEEL CASTINGS - BAR STEEL
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK

GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
LONDON (ENG) OFFICE —
— TRAFALGAR HOUSE, WATERLOO PLACE.

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL

Starting Right

A large property bought some O-B Trolley Bases to try out.

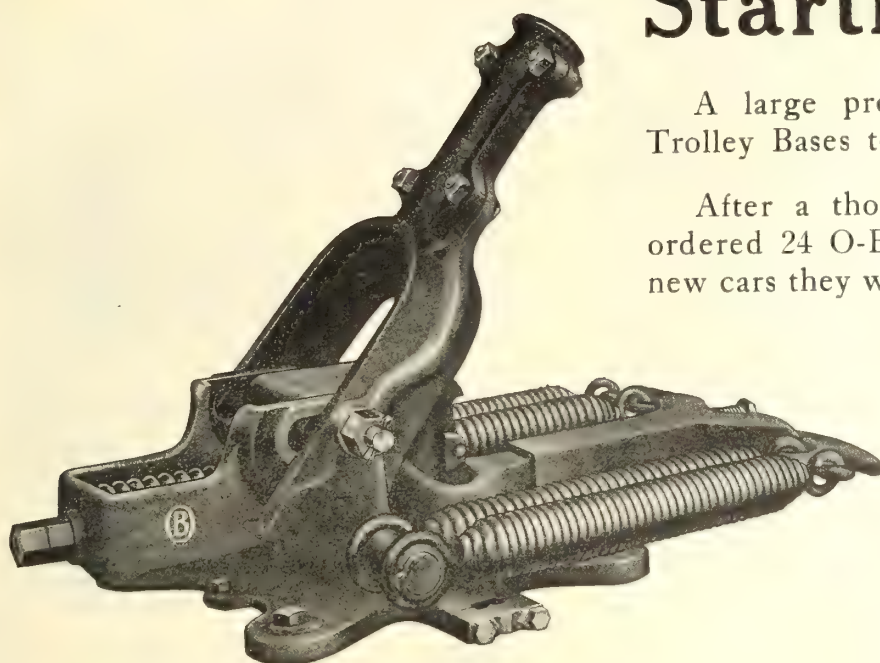
After a thorough trial in service they ordered 24 O-B Bases with which to equip new cars they were building.

They realized the wisdom of beginning with good equipment.

Listed in Catalog No. 16.

The Ohio Brass Co.

Mansfield, Ohio



Form 1
O-B TROLLEY BASE



Why Don't You Find Out More About Fabrikoid ?



Every square inch of Du Pont FABRIKOID is as good as the inch next to it. Examination of a leather hide in various places shows plainly that the strength is seldom the same in any two places in the hide.

Every Master Car Builder should acquaint himself with the superior qualities of FABRIKOID for railroad uses before specifying materials for the work in hand.

Uniformity in strength of materials used by railroads for car seats, cab and caboose cushions is an absolute essential when you consider the extremely hard wear to which this class of material is subjected.

A TRIAL ORDER

AND YOU WILL BUY DU PONT FABRIKOID REGULARLY.

Du Pont Fabrikoid Company

Canadian Factory, Toronto, Canada

Du Pont Building, Wilmington, Del.

Wendell & MacDuffie Co., Railroad Department Representatives, 61 Broadway, New York



WIRES and CABLES for STEAM and ELECTRIC RAILWAYS



THE fact that most of the steam and electric railroads in this country are using our products and continue from year to year to send in their repeat orders, is the best indication of what users think of Northern Electric quality.

No manufacturer pays more painstaking attention to the wire and cable requirements of the railroads; and the manufacturing and shipping facilities of our new Montreal plant are unsurpassed.

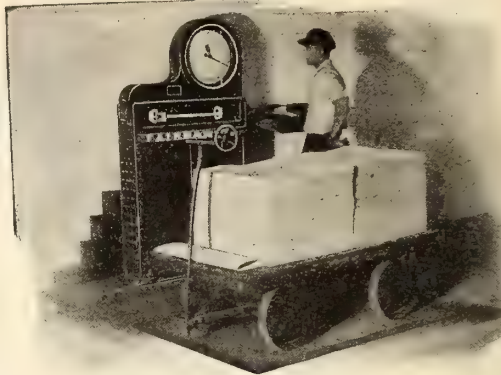
Here are some of the lines we make:—

- Railway Signal Wire, bare and rubber covered.
- Rubber-Covered Wire for round houses and repair shops.
- Asbestos Insulated Wire for Headlights.
- Reinforced Weatherproof Cables and Armored Cables for use in car shops.
- Magnet Wire for rewinding motors.
- Car Wire for electric light, fan, annunciator, motor and control circuits.
- Trolley Wire.
- Bare Weatherproof and Paper Insulated Feeder Cables.
- Bonding Cables.
- Paper-insulated, Lead-covered Telephone Cables and Bare Wires for Train Dispatching.
- Paper-insulated and Rubber-insulated Telegraph Cables.
- Armored Cables for bridge installations.



Northern Electric Company
LIMITED

MONTREAL HALIFAX TORONTO WINNIPEG
REGINA CALGARY VANCOUVER



Fairbanks Dial Scale

FULL CAPACITY
DIRECT READING

This is the most highly developed machine of its type for modern, quick-weighing Service.

To simply place a load upon a platform, and immediately read its correct weight from a plainly graduated dial, is undoubtedly, the closest approach imaginable to 100 per cent weighing efficiency.

The FAIRBANKS DIAL INDICATOR does all this, and combines exclusive features that have taken years of experience to develop. It is the logical indicator for every-day service requiring quantity weighing with speed and accuracy.

The FAIRBANKS DIAL INDICATOR can be applied to any Dormant type of Scale that is in good working order.

Write for Bulletin.

**The
Canadian Fairbanks-Morse
Co., Limited**



MONTREAL, QUEBEC,
ST. JOHN, OTTAWA,
TORONTO, HAMILTON,
WINNIPEG, SASKATOON,
CALGARY, VANCOUVER,
VICTORIA





Berry Brothers' Railway Varnishes

Need no introduction to experienced railway men. For nearly 60 years they have been the standard of railway varnish quality and their constantly increasing sale is undisputable testimony of their great efficiency.

Here are a few valuable finishes for railway use.

Inside Coach Finishing

A high grade varnish, very pale, heavy bodied and well matured. It is an easy working, free flowing varnish and dries quickly and hard with an attractive lustre.

Outside Coach Rubbing

A very pale, easy working varnish, dries quickly and can be rubbed in two days.

Inside Coach Rubbing

A superior rubbing varnish, is light in color, dries and hardens quickly, rubs easily and makes an ideal surface for the finishing coats.

Luxeberry Wood Finish

A high grade interior varnish for Stations, etc. Can be rubbed and polished if desired.

Outside Coach Finishing

A pale full-bodied varnish that dries dust free quickly. It is very durable, resisting wear and tear and dries with an attractive lustre.

If you have not already received a copy of our new catalog of Railway Varnishes, write us today, for the best catalog of its kind ever published.

BERRY BROTHERS
(INCORPORATED)
World's Largest Varnish Makers

WALKERVILLE

ONTARIO



Canadian Northern All the Way

From the Laurentians to the Rockies

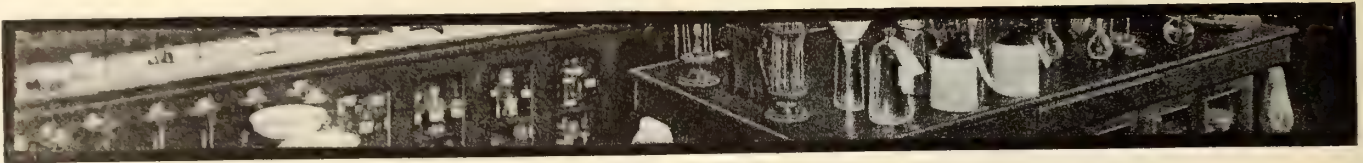
Serving Canada's National Playgrounds, including

Grand Discharge of the Saguenay: Laurentide National Park: Algonquin National Park: Muskoka Lakes: Georgian Bay Hinterland: Nipigon Forest Reserve: Quetico National Park: Vermillion Lakes: Jasper National Park: and Mount Robson National Park.

All Modern Equipment

Summer Tourist Fares

For Literature and information apply to General Passenger Dept., 68 King St. E., Toronto, Ont., 226 St. James St., Montreal, Que., or Union Station, Winnipeg, Man.



Superintendents of Motive Power, Fuel Agents, Officials in Charge of Operation

Should investigate the merits of the Dearborn Method of Water Treatment.

It is inexpensive—costs less than any other method.

It is effective—the waters requiring treatment are analyzed, and the treatment made to meet the actual requirements.

It accomplishes—the removal and prevention of scale—stops leaks—prevents corrosion—overcomes all foaming trouble.

The benefits—life of boiler tubes greatly lengthened—expense for boiler work reduced to minimum—mileage between boiler washings increased—large saving in fuel effected by having boilers free from scale. All the troubles due to bad water overcome and service generally improved.

Experts furnished to instruct in application of treatment.

Now used on more than 100 American railways.

Dearborn Chemical Company of Canada, Limited

Office and Works: 1220-1230 Dundas Street, Toronto, Canada

Cut Filing Costs in Half



Filing is like drilling. The moment the file wears smooth, it takes twice, or three times, the energy to accomplish the desired result. Engineers have got it down to a scientific basis in drilling. The moment a drill reaches its "inefficient point" it is discarded and this "efficient point" is determined by the amount of power used to drill a certain dimension.

Workmen are not machinery; consequently you have to depend upon

the personal element and educate your men up to the point where they will know at once when their files have reached the "inefficient point". If you can educate your men to do this you will get double the results at the bench, compared by results when men have been working with files that are inefficient.

The Famous Five are: Kearney & Foote, Great Western, American, Arcade, Globe
(MADE IN CANADA)

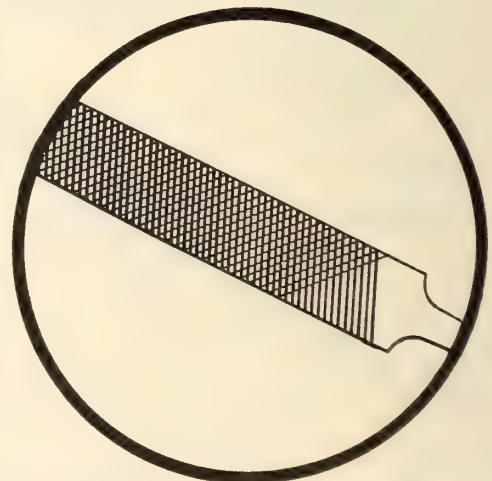
Write for our booklet "File Philosophy." It is well worth reading by any manufacturer, shop superintendent, shop foreman or workman who is concerned with the use of files.

Nicholson File Company

Port Hope

(Dealers Everywhere)

Ontario

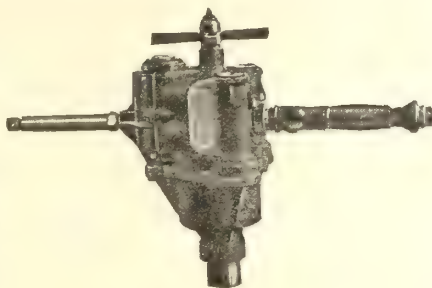


"Little David" Pneumatic Tools

are indispensable around the shop. They have less parts than any other similar machine and are light, but strong, and convenient to handle.

"LITTLE DAVID" Drills

are made in sizes and types for every portable drilling operation and bearings work in a grease packed dust proof case.



"LITTLE DAVID" Riveters, Chippers, Scalers

are made in sizes for every demand. Their through bolt construction avoids troublesome, leaky, screwed joints.

Ask for Bulletins.

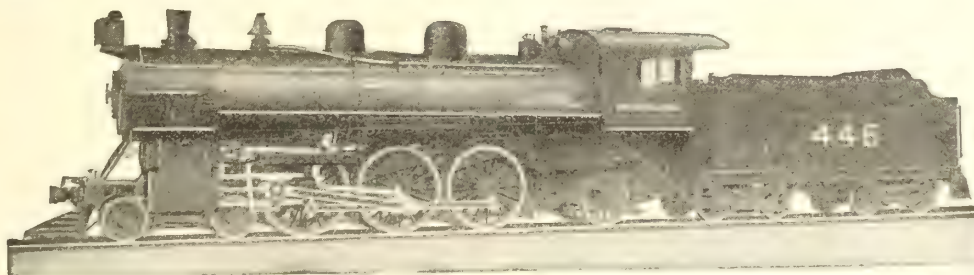
Canadian Ingersoll-Rand Co., Limited

Commercial Union Bldg., MONTREAL, CANADA

Works: SHERBROOKE, QUE.

SYDNEY TORONTO COBALT TIMMINS WINNIPEG NELSON VANCOUVER

Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE—INTERCOLONIAL RAILWAY

Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

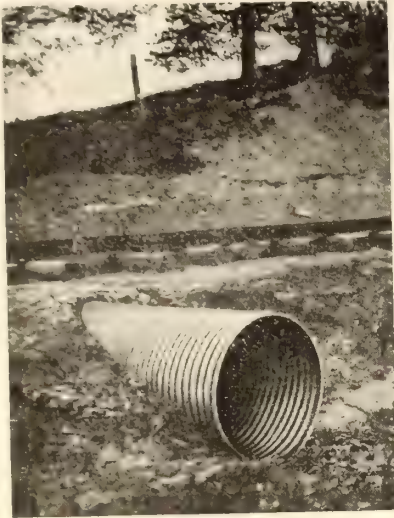
On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

Montreal Locomotive Works, Limited

DOMINION EXPRESS BUILDING, MONTREAL, CANADA




Strongest--Because Heaviest

JUST examine a Pedlar Culvert, gauge for gauge, weight for weight, length for length, with any other culvert you admire and you will immediately disclose the secret for the pre-eminence and general use among Canadian Railroads.

Pedlar's Culverts

Made with narrow and deep lateral corrugations which gives them their strength, weight and endurance.

Made of heavy gauge anti-corrosive  possessing wonderful strength, ductability and malleability.

Shipped in sizes from 8 in. to 84 in. in diameter, and in lengths up to 40 ft. Special sizes to order.

Large stocks always on hand for prompt shipment.

Write now for complete Culvert Reference Book R.M. and ask for quotations on any size or quantity desired.

THE PEDLAR PEOPLE, Limited

(ESTABLISHED 1861)

Executive Office and Factories, OSHAWA, ONT.

Branches :

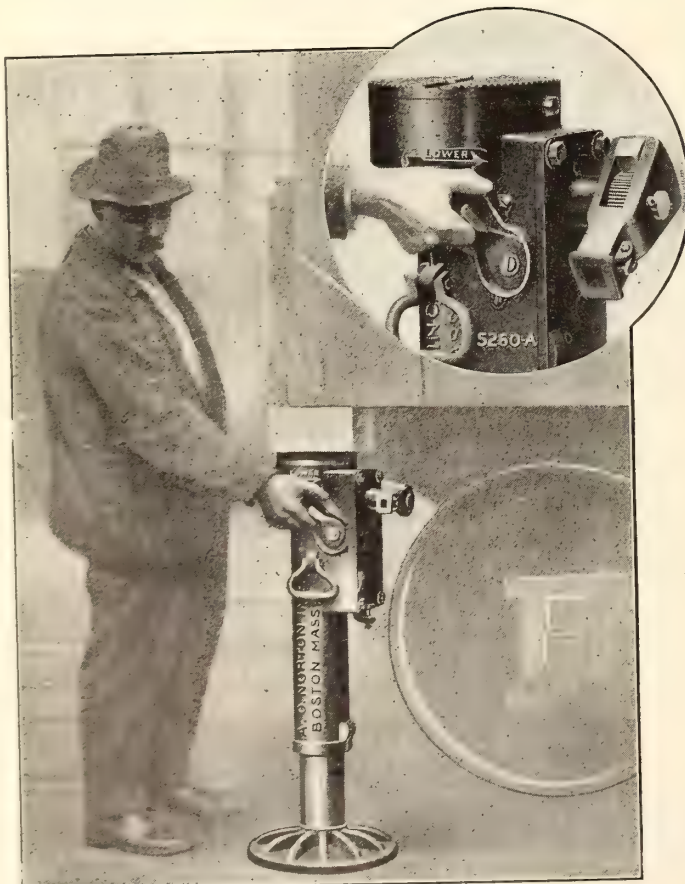
MONTREAL

OTTAWA

TORONTO

LONDON

WINNIPEG



Don't Pump Your Jack Down
Lower the Load by "Pressing the Button"

The Norton Self Lowering Jack

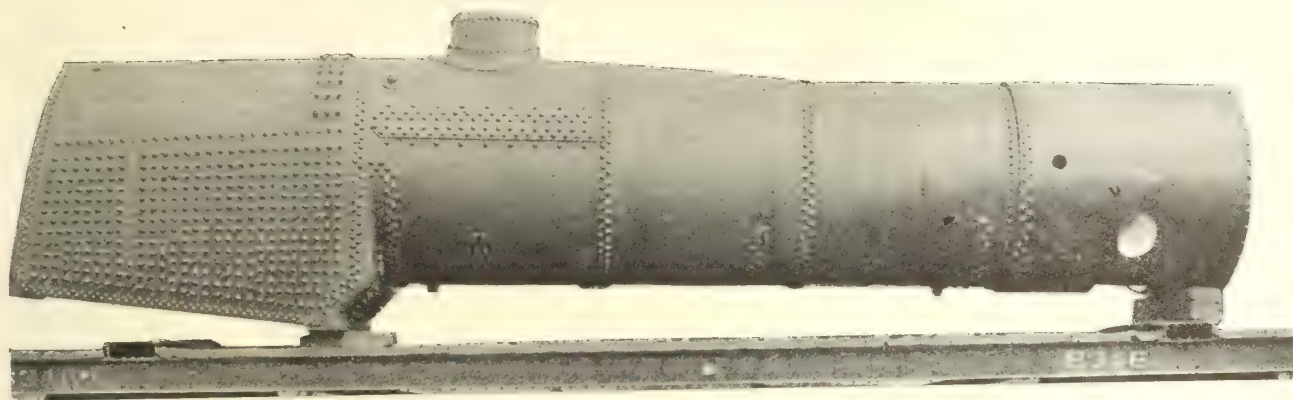
is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

Send for Illustrated Catalogue No. 28.

A. O. Norton, Limited
Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents :
MUSSENS LIMITED

Montreal Toronto Winnipeg Cobalt Calgary
Vancouver



THE ART OF STAYING—The locomotive fire box will advance in just that proportion as suitable and adequate means are provided to enable the fire box to expand under the least restriction.

STAYBOLTS BREAK—when the stress of fire box expansion is too severe, and fire sheets distort and crack when staybolts are too rigidly connected to same.

THE TATE FLEXIBLE STAYBOLT—is designed and made to give satisfactory results in the final measure of its usefulness, as an economic, safe and reliable factor in reducing the costs of fire box repairs and maintenance.

ANY ARTICLE THAT CONTRIBUTES—to the service value of the locomotive as an earning factor is well worth considering carefully. From the knowledge of what has been accomplished by the use of the Tate Flexible Staybolt, we feel confident that all our patrons are well aware of its true value.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.



FRANKLIN
AUTOMATIC
FIREDOOR

I WOULDN'T FORGET
THAT THE HORSE POWER
OF BIG ENGINES IS
SHOVELED THROUGH THE
FIREDOOR.

I would get the firedoor that makes the most
horse power.

Franklin Railway Supply Company

30 CHURCH STREET, NEW YORK

332 So. Michigan Ave.
CHICAGO

625 Transportation Bldg.
MONTREAL

**Canadian
Government
Railways**

4

Nationals

for
Western Canada, Pacific Coast

NEW trains via **NEW** route, through **NEW** country
making **NEW** links
between the

ATLANTIC *and* PACIFIC

connecting HALIFAX - SYDNEY - ST. JOHN with

QUEBEC-COCHRANE-WINNIPEG

SHORTEST ROUTE - QUICKEST TIME

The **Western-National**

Through Observation Sleeping Cars

Dep. Quebec 2.00 p.m. Tue. Thur. Sat.
Arr. Cochrane 4.10 p.m. Wed. Fri. Sun.
Arr. Winnipeg 4.30 p.m. Thur. Sat. Mon.

The **National Atlantic**

Dep. Winnipeg 5.15 p.m. Sun. Tue. Thur.
Dep. Cochrane 7.15 p.m. Mon. Wed. Fri.
Arr. Quebec 9.10 p.m. Tue. Thur. Sat.

TORONTO-WINNIPEG

The **National** (west bound)

Through Sleeping and Dining Car Service

Dep. Toronto 10.45 p.m. Tue. Thur. Sat.
Arr. Winnipeg 4.30 p.m. Thur. Sat. Mon.

The **National** (east bound)

Dep. Winnipeg 5.15 p.m. Sun. Tue. Thur.
Arr. Toronto 12.05 p.m. Tue. Thur. Sat.

**Canadian
Government
Railways**

4

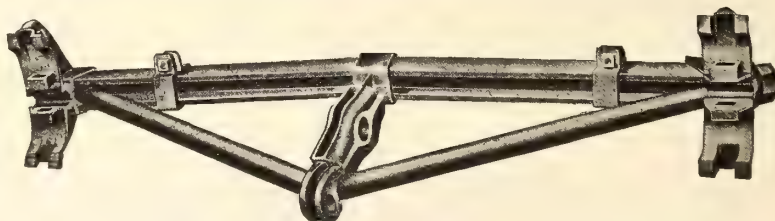
Nationals

for
Yukon - Alaska

Buffalo Brake Beam Company

BUFFALO BEAMS ARE BEST BEAMS

Offices:
NEW YORK
30 Pine Street
ST. LOUIS
Syndicate Trust Bldg.
MONTREAL
195 Commissioner St.



Works:
BUFFALO,
N. Y.

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment



The Star Brass Works

Largest Exclusive Trolley Wheel Makers in the World.

Kalamazoo

Michigan



Canada Iron Foundries, Limited

Chilled Tread Cast Iron Car Wheels for All Services
Cast Iron Water, Gas and Culvert Pipe,
Flanged Pipe and Specials
Railway Castings

HEAD OFFICE :

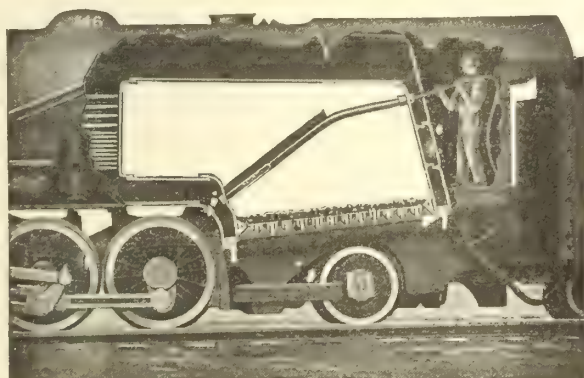
Mark Fisher Building

- - -

Montreal



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes.

Lagonda Arch Tube Cleaners

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

Other Lagonda Boiler Room Specialties are described in our General Catalogue L. Send for Copy.

Babcock and Wilcox, Limited

Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Buildin



Car Bolster Spring with Pressed Steel Caps

Railway Springs

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS
of every description.

EQUALIZING, DRAWBAR, BUFFER AND SPIRAL SPRINGS
of all kinds.

STREET RAILWAY SPRINGS, from the largest to the smallest.

TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE
SANDERS, CHAIN, Etc.

Manufactured by

B. J. Coghlin Company, Limited
Montreal, Canada

The Parmelee Pipe Wrench



Price List C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 in.	\$5.00	\$2.25	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 in. \$.75
20 in.	2 $\frac{1}{2}$	$\frac{3}{4}$, 1, 1 $\frac{1}{4}$, 1 $\frac{1}{2}$, 2 in.	7.50	2.50	$\frac{3}{4}$, 1, 1 $\frac{1}{4}$ in. 1.00 1 $\frac{1}{2}$, 2 in. 1.25
36 in.	3 $\frac{1}{2}$	1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3 in.	7.50	3.00	1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3 in. 1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Limited

Toronto, Canada

"The Toothless Wonder"

Designed Especially to handle pipes spaced closely as in coil work. No. 2 $\frac{1}{2}$ wrench illustrated requires but three-quarter inch space between pipes.

Positive Grip instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

Ratchet-like Action. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

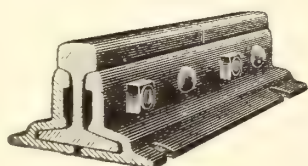
Can't Chew. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

Can't Crush. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.

The Rail Joint Company of Canada, Limited

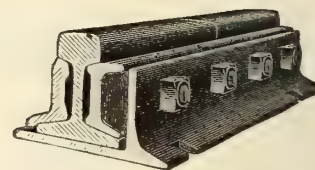
McGill Bldg., MONTREAL

36 Broad Street, London, E.C.

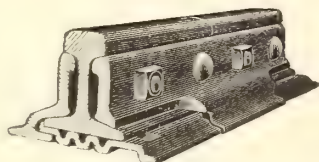


CONTINUOUS

Continuous,
Weber, Wolhaupter and
100 p.c. Rail Joints.



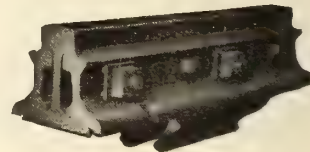
WEBER



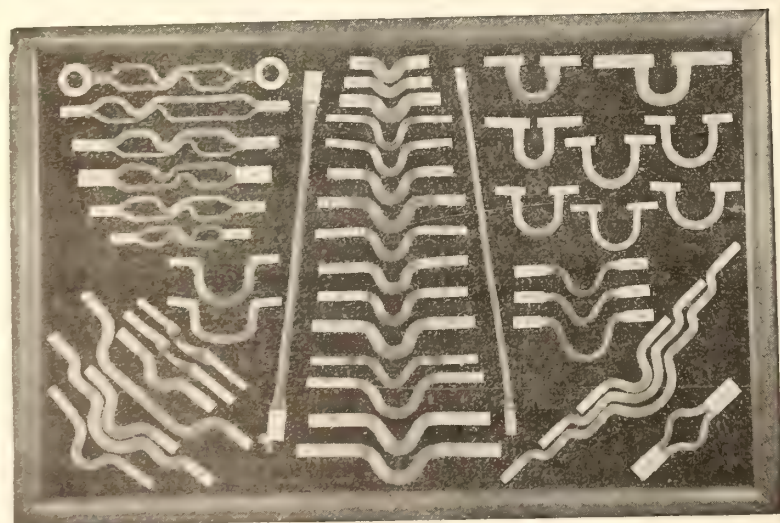
WOLHAUPTER

Standard—Insulated
Step—Frog and Switch
Protected by Patents.

Grand Prize, San Francisco, 1915.



100 p.c.



Electric Weld Rail Bonds

meet every condition.

Neither do they corrode
at the terminals.

**The Electric Railway
Improvement Co.**

Cleveland, Ohio

Dominion Iron & Steel Co., Limited

Manufacturers of

Basic Open Hearth Steel Rails

We will be pleased to have your enquiries for 1916 shipments

Head Offices
and Works

Sydney, Cape Breton, Canada

Lighting Carbons for all Purposes

We are prepared to supply you with arc lamp carbons to fit all types of open, enclosed and flame arc lamps—also carbons for projection work.

We are pioneers in the lighting carbon field. We made carbons for the first arc lamps used in this country and are now furnishing carbons for the most highly developed flaming arc lamps.

Head-lights—Carbons of any size or shape for any make or type of head-light. Our head-light carbons are used by the largest railroads on the continent.

Large area lighting—Railroad yards, wharves, shops and factories using arc lamps of any type will be better lighted if our carbons are used. Write us your requirements and we will make recommendations.

If you use carbons in any form for any purpose, it will pay you to get in touch with us.

Welding carbons, electric furnace electrodes and carbon brushes to meet all conditions of operation.

Write for samples and prices.

Canadian National Carbon Company, Limited

265 Adelaide Street West, Toronto, Ontario

Dominion Iron & Wrecking Company

LIMITED

Railway Equipment, Rails and Machinery

Dismantlers of BRIDGES, PLANTS, STEAMERS, MILLS

Dealers in IRON, STEEL, SCRAP METALS

General Offices: Transportation Building

TORONTO

QUEBEC

MONTREAL, QUE.

ST. JOHN, N.B.

Car Ventilation

Expert Advice is as needful in this as in other matters of Car Construction. Is not the experience of twelve years, devoted exclusively to this field, worth anything to you? We have it, and it is yours for the asking.

CAR VENTILATORS of all types at prices from \$1.50 up.

For information address

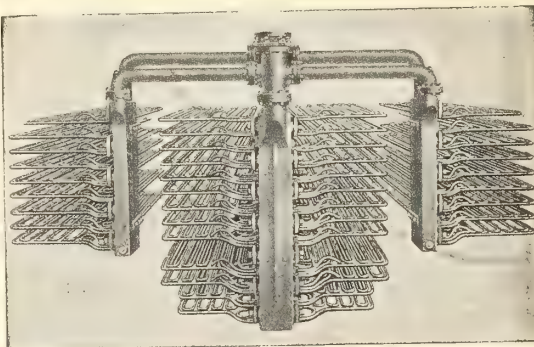
Automatic Ventilator Company

No. 2 Rector Street

New York, N.Y.

Fire Tube Marine Superheater -- Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler h.p. from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, New York, N.Y.

Peoples Gas Bldg., Chicago, Ill.

ALGOMA STEEL CORPORATION LIMITED

STEEL RAILS
PLICE BARS
STEEL TIE PLATES

PIG IRON
BASIC & BESSEMER



STRUCTURAL SHAPES
STANDARD MERCHANT
BARS

BLOOMS BILLETS
& SLABS

SAULT STE. MARIE, ONT. CANADA.

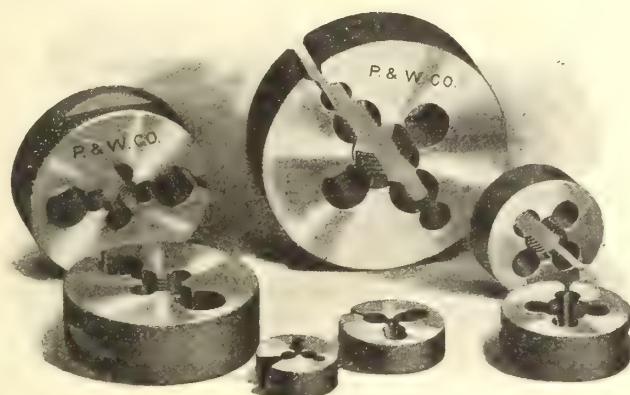
Are You in the Market for Trolley Catchers, Retrievers, Bases or Head Lights

We manufacture Knutson No. 5 Trolley Retriever, Knutson No. 2 Trolley Retriever, The Ideal Trolley Catcher, The Simplex Trolley Base, The Peerless No. 10 Roller-bearing Trolley Base, The Peerless Check Valve, The Peerless Junior Head Light, The Perfect Head Light, The Hollis Safety Fender, No. 3 Detachable Fender.

Write our Canadian Representatives Allen General Supplies, Limited they will be pleased to give you complete information as to any of the above as well as our other lines.

Trolley Supply Company, Canton, Ohio

Address all correspondence to Allen General Supplies, Limited, 205 Yonge St., Toronto



MADE IN CANADA

Dies!

For All Kinds of Screw Cuttings

Reamers—Drills—Cutters
Taps

“THE GUARANTEED LINE”

Sold on Merit

Get Our No. 8 Catalogue

Pratt & Whitney Co. of Canada, Limited, Dundas, Ontario
Montreal Vancouver Winnipeg

Jas. W. Pyke & Company, Limited

Iron, Steel and Metal Merchants

Locomotive, Driving, Engine and Tender Truck Axles, Passenger, Freight, and Electric Tram Car Axles—To Standard or Railway's own Specification.

Staybolt and Engine Bolt Iron—Quality and Service Unexcelled.

Steel Plates—Firebox, Flange and Tank Qualities.

Structural Shapes—Beams, Channels, Angles, Tees, Zees, etc.

Steel Billets and Forgings—of all descriptions.

Locomotive Boiler and Superheater Tubes—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
232 St. James Street,

Montreal

SAVE YOUR MONEY

FOR THE
DOMINION WAR LOAN
TO BE ISSUED IN SEPTEMBER.

By purchasing a bond you will help to WIN THE WAR and obtain for yourself an investment of the highest class yielding a most attractive rate of interest.

DEPARTMENT OF FINANCE
OTTAWA.

ENAMELED IRON SIGNS

The ideal signs for
Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.

We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc,

Guaranteed not to
fade or be affected
by the weather in
any way.

Complete Hydraulic Equipment

For Railway and Shipbuilding Plants

Wheel Presses, Keel Plate Bending Presses, Riveters, Shears,
Presses, etc. Centrifugal Pumps, Pumping Engines, Gas Plants, Gas
Power Plants, Cast Iron Pipe, Hydrants, Valves and Fittings, etc.

R. D. WOOD & CO. Philadelphia, Pa.

Acton Burrows
Limited

Enameled Iron Signs

70 Bond Street - Toronto



The Marine Lubricants manufactured by the Vacuum Oil Company suit the uses they are manufactured for, better than any on the market. They are:

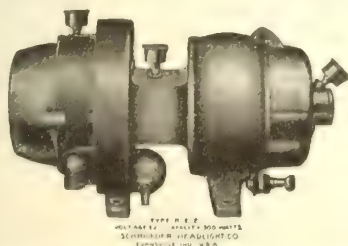
GARGOYLE MARINE ENGINE OIL No. 1
GARGOYLE CYLINDER OIL 600 W

These special marine oils are obtainable at all ports. The Imperial Oil Company, Limited, Canadian agents of Vacuum Oil Company, maintains the following special Marine Delivery Stations:

Fort William	Quebec
Halifax	Sault Ste. Marie
Hamilton	Sarnia
Kingston	St. John, N.B.
Montreal	Toronto
No. Sydney	Windsor
Ottawa	Vancouver
Owen Sound	Victoria, B.C.

THE IMPERIAL OIL COMPANY LIMITED

Canadian Agents, VACUUM OIL COMPANY



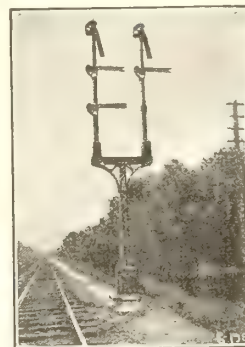
70 Schroeder Incandescent Headlights

In Service
270 days without any expense for repairs.
As a result of this exceptional service
150 more have just been ordered.

The HIRAM L. PIPER CO., Limited
MONTREAL, Sole Agents for Canada

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. BABBITTS. Miscellaneous Brass Castings for Railroads.
Works and Office: 69 Delorimier Avenue, MONTREAL, QUE.



STANDARD Signal Wire

will give dependability to your electric circuits and reduce maintenance cost.

Recommended by years of successful service on some of the largest signal systems on the continent.

Write our nearest office for further information.

Standard Underground Cable Co., of Canada, Limited
Hamilton, Ontario

Montreal, Que. Winnipeg, Man.
Seattle, Wash.

ESTABLISHED 1849.

BRADSTREET'S

Capital and Surplus, \$1,500,000.
Offices throughout the Civilized World.

Executive Offices:
NOS. 346 and 348 BROADWAY,
N.Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA:

Halifax, N.S.; Hamilton, Ont.; London, Ont.;
Montreal, Que.; Ottawa, Ont.; Quebec, Que.;
St. John, N.B.; Toronto, Ont.; Vancouver, B.C.;
Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.;
Victoria, B.C.

THOS. C. IRVING,
Gen. Man. Western Canada, Toronto.



Capital Authorized.....\$10,000,000
Capital Paid up.....7,000,000
Reserve Fund.....7,000,000

Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the World.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.



A Square Deal

The policy of the Dominion Rubber System is to provide every need in Rubber Goods, and to give a square deal to every buyer no matter what the purchase may be. That means—

A Square Deal in Values As Well as Qualities

Whether the purchase be a Rubber Nipple for the baby's bottle, a Rubber Shoe, a "Nobby" Tread Tire, or Inlaid Tiling for a Parlor Car, we insist that the goods must be absolutely satisfactory.

No matter what the need in rubber may be, write to our nearest Branch or direct to the Head Office.

Canadian Consolidated Rubber Co., Limited

Executive Office, Montreal, P. Q.

28 "Service" Branches Throughout Canada.

Canadian Railway and Marine World

September, 1916.

The Engineering Department's Plan Room, Canadian Pacific Railway, Montreal.

The plan room in the C.P.R. Chief Engineer's office on the fourth floor of Windsor Street Station, Montreal, is one of the most modern and efficient in America. In a concrete and steel fire-proof vault, some 90 ft. long, 30 ft. wide, and 11 ft. high, over 80,000 maps and plans, a large number of engineering reference books, current engineering magazines, catalogues and special reports are filed in steel cabinets in such a manner as to be instantly available at any time. The accompanying plan shows the layout of the room and equipment.

When a new plan is to be placed on file, a detachable stub slip, shown in accompanying fig. 1, filled out with all the information necessary for filing purposes, accompanies it to the plan room.

own consecutive sub number. Record is kept of these sub numbers so that it is readily ascertained at any time whether the plan is complete, and if not just what sheet is missing. It is then indexed in the proper places and is ready for issue on demand. The detached portion of the filing slip is finally returned to the marker for his record.

Rolled plans which do not exceed 54 in. in width are assigned consecutive numbers and placed in tiers of numerically arranged horizontal dropend sliding steel pigeonholes, which contain 10 plans each; maps and other rolled plans exceeding this dimension are assigned special numbers and filed vertically in the map cases. Special provision is also made for track profiles, which are all of one size, are

standing open practically all the time and collecting an almost inconceivable amount of dust and dirt. The plans were filthy in spite of persistent use of a vacuum cleaner. At present they accumulate more dirt while in use than while in the files. The pigeonholes and drawers are always closed and during three years of service have required no cleaning. This is a large saving in operating cost, as well as a vital factor in the preservation of the plans themselves.

For indexing, both card and book systems, with extensive cross indexing, are in use. Yard, bridge building, standard, foreign and miscellaneous plans, as well as books, magazines, etc., are recorded in separate portions of the card index cases. They are listed under station

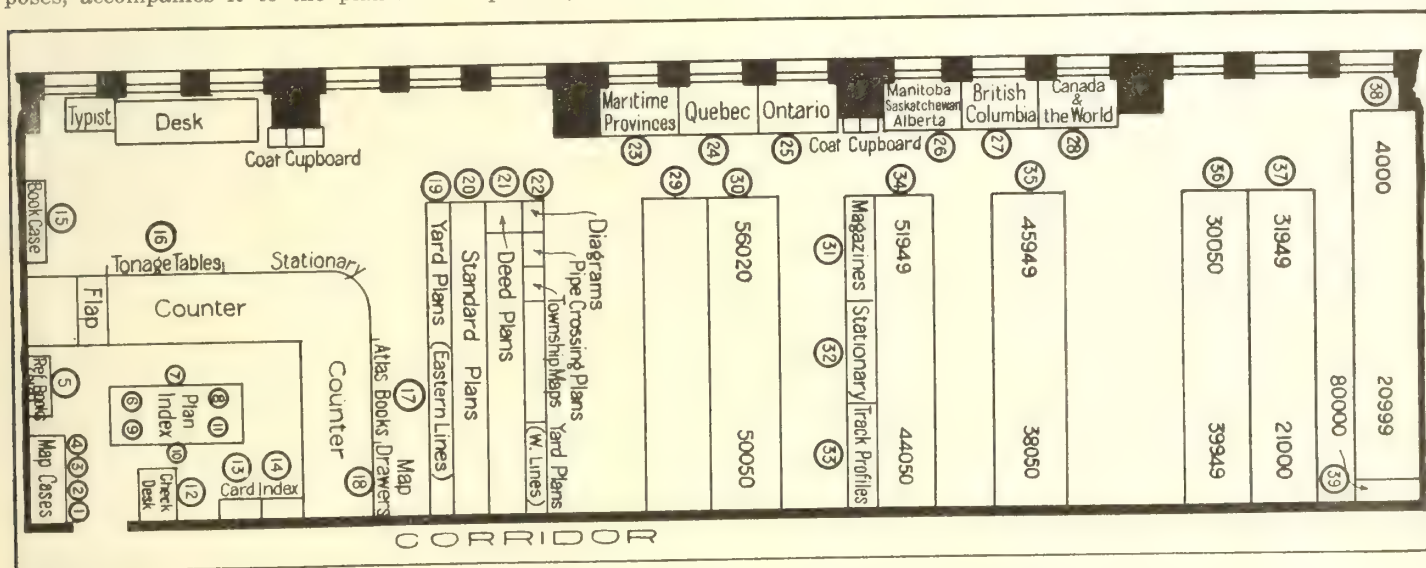


Fig. 1—Plan room, Chief Engineer's office, C.P.R., Montreal.

17. Atlases of Canada, old.
15. Books, engineering, miscellaneous and catalogues.
14. Bridge index, eastern and western lines.
12. Check desk.
21. Deed plans, C.L.O. & W.Ry., G.B. & S.Ry., and Sudbury-Kleinburg Ry.
22. Divisional diagram of lines.
5. Index books, old bridge and miscellaneous.
6. Index books, main line, Nos. 1 and 2 branch line, old.
9. Index books, Eastern main and branch line, new.
10. Index books, Montreal Island, new.
11. Index books, western main and branch lines.
13. Index cards, eastern and western yards, station and general.
14. Index, bridge, eastern and western lines.
31. Magazines, various.
1. Maps, large, Maritime Provinces and Quebec.

2. Maps, large, Ontario.
3. Maps, large, Western provinces.
4. Maps, large, Canada general.
18. Maps, Montreal, in sheets.
23. Maps, Maritime Provinces, Interior, Post Office, Militia, Geologic, Admiralty, provincial, counties and townships, general publishers, town and cities.
24. Maps, Quebec, Interior, Post Office, Militia, Geologic, Admiralty, provincial, counties and townships, general publishers, towns and cities.
25. Maps, Ontario, Interior, Post Office, Militia, Geologic, Admiralty, provincial, counties and townships, general publishers, towns and cities.
26. Maps, Manitoba, Alberta, Saskatchewan, Interior, Post Office, Militia, Geologic, Admiralty, provincial, counties and townships, general publishers, towns and cities.
27. Maps, British Columbia, Interior, Post Office, Militia, Geologic, Admiralty, provincial,

counties and townships, general publishers, towns and cities.

29. Maps, Canada and World, Interior, Post Office, Militia, Geologic, Admiralty, provincial, counties and townships, general publishers, towns and cities.

20. Plans, standard and drawer.

30. Plans filed, 50050 to 56020.

34. Plans filed, 44050 to 51949.

35. Plans filed, 38050 to 45949.

36. Plans filed, 30050 to 39949.

37. Plans filed, 21000 to 31949.

38. Plans filed, 4000 to 20999.

39. Plans filed, 80000 to —.

20. Standard and drawer plans.

32. Stationary.

15. Tonnage tables, eastern and western lines.

33. Track profiles, eastern and western lines.

19. Yard plans, eastern lines.

22. Yard plans, western lines.

The stub is signed by the attendant in charge and returned at once to the maker. This serves as a receipt, which makes the signer responsible thereafter for producing the plan. He assigns the plan a number, under which it is recorded in the plan number journal in consecutive numerical order. If it is a rolled plan, he attaches a tag bearing the assigned number and places it in the proper pigeonhole; if it is a flat plan the number is placed in the corner of the plan, which is filed in a drawer. If the plan consists of two or more sheets, each sheet bears the assigned number and in addition its

filed flat in special drawers under special serial standard plan numbers. Small land plans, as well as yard plans, and all Militia, Interior Department and other government maps, are also filed flat in drawers; while magazines, books, and reports are filed on the shelves. All are under cover, thoroughly protected from dust and dirt.

Prior to the installation of steel cabinets, the plans which were filed in pigeon holes were protected by asbestos curtains. To uncover one pigeon hole, it was necessary to uncover one whole section, which resulted in the cases

names, bridge numbers or general subject headings. Property, resurvey, and generally all extensive plans, which cannot be definitely classified as to location under the card index headings are recorded in the book indexes. These are practically straight line diagrams of the entire system, at a scale of 1 in. to the mile, bound in loose leaf binders in consecutive geographical order. Under the diagrammatic headings, plans are recorded in chronological order, and their location, extent and kind indicated by the location, extent and color of the underlining below the description, as well

missioners, underlined with red and blue. "As constructed" plans and profiles, certified by Board of Railway Commissioners, underlined with double blue lines.

Any further revision of a certified plan and profile will be denoted by an additional line.

To withdraw a plan from the files, the applicant, after looking it up in the proper index, applies for it by number at

Charge No. 28403

May 15th 1916

Location Plan Mile 25-30 E.L.S. & A. Ry.

R. Simcox Signature

General Drafting DEPARTMENT

Fig. 4—Receipt for plan taken from plan room.

the counter, and an attendant delivers it. Its use in the plan room is unrestricted, ample counter space being provided for unrolling large plans. In order to take it from the plan room, a receipt showing the plan number, date, description of plan and the applicant's signature and department, as shown in the accompanying fig. 4, must be left with the Check desk attendant. This card is filed in a numerical index and withdrawn and destroyed when the plan is returned. The actual plan, or a full receipt for it, is thus at all times in the plan room.

To illustrate the efficiency of the sys-

and handled an average of 250 plans a day. This is probably the economic minimum for this type of handling, although one attendant could, no doubt, handle from 75 to 100 plans with little

difficulty or delay. It may be stated, generally, that this plan room is giving entire satisfaction as to the four essentials, safety, cleanliness, efficiency, and economy.

An Analysis of the Increases in Railway Operating Expenses.

By Sir Henry L. Drayton, Chief Railway Commissioner for Canada.

A large proportion of railway expenses is represented in the salary and wages account. The governmental statistics for all railways give the amount of salaries and wages for each year since 1907; and, what is more important, the ratio of salaries and wages each year to gross earnings and operating expenses. The statement is as follows:—

Year.	Salaries and Wages.	Ratio to Gross Earnings.	Ratio to Operating Expenses.
1907	\$58,719,493	40.01	56.70
1908	60,376,607	41.09	56.26
1909	63,216,662	43.58	60.43
1910	67,167,793	38.61	55.78
1911	74,613,738	39.53	56.94
1912	94,237,623	39.79	57.92
1913	115,749,825	45.09	63.59
1914	111,762,972	45.97	62.43

Salaries and wages, therefore, now represent more than three fifths of the total railway expenses and have increased at a more rapid ratio than the sum of other expenses, as evidenced by the above returns. A comparison of earnings and expenses per train mile is given from 1899

effective loading, as well as the benefit of a largely increased traffic, are reflected in these figures, the percentage of increase in expenses exceeds that in earnings by 23.96%. Taking the last five year period and comparing the results of 1910 with those of 1914, the earnings have increased 10.65%, and the expenses 17.74%.

The recently published statistics for 1915 give for the year ending June 30, 1915, similar earnings and expenses at \$2.144 and \$1.585 respectively, resulting in a ratio of 74 for the train mile expenses as compared with the train mile earnings. As compared with 1910 the increase in earnings is but 5.3% and the increase in expense 12.42%. In this case the percentage of increase in expenses more than doubles that of receipts. The year, however, including as it does 11 months of operations under war conditions cannot be accepted as a fair example of the earnings of the railways based on the present rates.

CANADIAN PACIFIC RAILWAY

OFFICE OF THE CHIEF ENGINEER

MONTREAL, September 1913

R. Simcox General Drafting Dept.

For your information, 1 sheet Tracing have been indexed under No. 54683

and described as As Constructed Plan Lake Simcoe Sub-division

Mile 0 to 30 1" = 400 ft

C. E. Office,
May 15th 1913
Cert. Ry. Com.
Aug. 22nd 1913

N. Willard
Recorder of plans.

Fig. 2—Stub slip for filing plans.

in the Government statistics as follow:—

	Earnings per Train Mile.	Expenses per Train Mile.
1899	\$1.192	\$0.779
1900	1.282	0.864
1901	1.366	0.944
1902	1.501	1.028
1903	1.591	1.117
1904	1.634	1.216
1905	1.614	1.213
1906	1.723	1.198
1907	1.953	1.381
1908	1.869	1.364
1909	1.816	1.309
1910	2.036	1.409
1911	2.103	1.460
1912	2.173	1.493
1913	2.263	1.604
1914	2.253	1.659

This return shows that, while earnings per train mile have been increased by 89.00% since 1899 and down to June 30, 1914, the cost of service per train mile has increased by 112.96%. While the many economies effected by increased locomotive power, better grades, and more

The statistics indicate in different directions the causes of this increase.

That the increased ratio is the result of a higher wage scale rather than improvident railway managership in unnecessarily increasing the number of their employes, is quite evident from the fact that the number of railway employes per 100 miles of line operated in 1913 was 609; in 1914 the number amounted to only 517; in 1907, when the ratio was but 56.70, 551 employes are shown per 100 miles; in 1908, where the ratio fell by 0.44, 463 were employed per 100 miles of line. Notwithstanding the resultant economies effected in the wage account by employing 19,510 less men in 1914 than in 1913, a reduction of approximately 11%, the resultant economy expressed in ratio to other operating expenses is but 1.16, while the ratio of salary and wage account to gross earn-

tem, an actual instance, which is only typical, may be cited, which occurred recently in the presence of a prominent official of another railway, who was viewing the plan room and its operation. A member of the Bridge Engineer's staff entered the plan room, referred to the bridge index, and requested a plan. An attendant started for it and stopped when the check desk attendant announced, "Out to Mr. —, in the Building Department." The applicant left the plan room less than a minute after he had entered it, with full information as to where he could find the plan. If the plan had been in the files, he would have taken it with him inside of another minute.

In busy times a staff of 5 attendants has recorded and handled over 1,000 plans across the counter in an 8-hour day. In slack times a staff of 2 has recorded

ings shows an increase of 0.88, notwithstanding the great economy worked in the reduction of the force of men employed. Illustrating the situation by percentages, both of men and salaries and wages per 100 miles of line, the following is the result, taking the year 1907 as the basis of comparison:—

	Salaries and Wages.	Percent- age Increase.	Em- ployes.	Percentage
1907...	\$268,000	.....	551	....
1913...	391,636	48%	609	10% increase
1914...	364,048	38%	517	10% decrease

The result is apparent; notwithstanding a decrease in the number of employes per mile of line in 1914 of 10%, the cost of employment on the same basis rises to 38%.

The government statistics also show that the cost of railway ties has advanced steadily for a number of years, the average cost per tie in 1914 being shown as 49.7c as against 47.8c in 1913, while the average cost in 1907 is shown as 36.7c; 1911, 43.8c; and in 1912, 44.7c. The cost in 1915 is given as 53.7c. The increased cost in 1914 is 38% over the cost in 1907, and in 1915, 46%.

In the same statistics it appears that the cost of fuel per 100 miles of operation has also increased. The cost of running a freight locomotive in 1907, for 100 miles, was \$19.61; in 1908, \$23.20; in 1909, \$22.65; in 1910, \$22.48; in 1911, \$22.17; in 1912, \$24.46; in 1913, \$25.51; in 1914, \$25.64. The resultant cost in 1915 over 1907 is 30%. The average cost of fuel is given for the year as \$3.12 per ton, and for 1909, \$2.56 per ton. The price of coal varies, of course, from time to time, being sometimes higher and sometimes lower, but the general trend is to the higher figure. It may be observed that the percentage of increase of cost of coal between 1909 and 1914 amounts to 21.8% while the cost of running a freight locomotive 100 miles in the like period, notwithstanding the fact that the tendency is in the direction of heavier engines, is but 13.25%. The difference in the ratio of increase is an indication of the increase of engine efficiency.

The railway earnings as expressed in the average receipts per ton per mile on the above traffic are given as:—

1907	0.815
1908	0.723
1909	0.727
1910	0.739
1911	0.777
1912	0.757
1913	0.758
1914	0.742

The tax bill of the railways is shown for 1914 as \$2,822,774.35, and for 1915, \$3,049,727.62, as against \$1,581,336.59 for 1909, or an increase of 78.5% for 1914, and of 92.2 for 1915.

On the question of the freight traffic itself indicating the volume of business done by the railways expressed in the number of tons hauled one mile, the figures are as follows:—

1907	11,687,711,830
1908	12,961,512,519
1909	13,160,567,550
1910	15,712,127,701
1911	16,048,478,295
1912	19,558,190,327
1913	23,032,951,596
1914	22,063,294,685

The returns of 1915 only show 17,661,309,723 ton miles. In view, however, of the exceptional conditions then obtaining the returns of that year cannot be regarded as characteristic.

The above figures have reference to railway operations for Canada as a whole, and cover the activities of all rail-

way companies, under the act, as reported to the Department of Railways and Canals. They are compiled from returns made in the ordinary course of business. The returns were not made for the purpose of any rate increase or for any object, except to show the shareholders and the public the position of the different railway companies, and to conform with the statute. The results are of value as constituting a check for and standard by which the evidence given and exhibits filed in this case for the purpose of obtaining higher rates may, to some extent, be measured.

On the side of expenses, the Grand Trunk figures show that hardwood ties purchased by that company in 1909 averaged 61.68c, softwood ties 39.4c, while the average price of hardwood ties in 1914 was 69.2c, and for softwood 44.9c, resulting in an increase in hardwood of 12.15% and for softwood 13.95%. The prices here again vary. For example, the average cost of hardwood ties to the Grand Trunk in 1910 was 62.55; so that the percentage of 1914 over 1910 is but 10.63%, while on the other hand, softwood ties were lower in 1910, the percentage increase in average cost in 1914 over that of 1910 amounted to 15.15%. The general trend is, however, higher.

The average rate of pay on the Grand Trunk varies in detail from the figures paid by lines generally in Canada, but in general conform to the conclusions to be drawn therefrom. In some instances, the wages paid by the Grand Trunk System are lower than the general average, in other instances higher; but the general result, however, is that the increase in the average rate of pay on the Grand Trunk System, comparing the year 1914 with 1909, amounted to 23.19%, or a total advance in the rate of pay of \$3,005,238.64.

I think it was only suggested by one opponent to any increase that wages should be reduced. In my view this is not possible. As a matter of fact, increases have been given in some instances by the company since the hearing. These increases, which individually may be small, nevertheless amount to a total percentage increase of 4.3%. I think it may be taken for granted that the company is paying no larger wages than it finds itself compelled to pay and that it is not being extravagant on this head. On the other hand, the company is economizing in connection with its labor expenses as well as on other items. The figures in this connection are as follows:—

Year.	Number.	Compensation.	Earnings per man.
1913	27,434	\$18,127,745.12	\$660.77
1914	25,663	17,861,294.66	695.99
1915	22,969	16,914,374.85	736.40

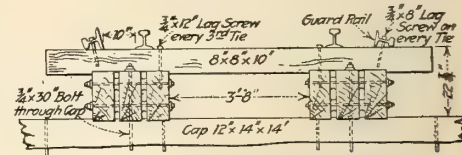
It will be observed that on this return there is an increase of 11.4% in earnings per man in 1915 over 1913, with a further result that, although there was a reduction of no less than 16.27% in the number of men employed, owing to the increased cost of wages, the net reduction in wages paid only amounted to 6.69%.

The company's coal figures may be said to agree with the general results of a sharp increase in the price of coal which has taken place in the last year. The increased cost to the company approximated \$600,000.

(EDITOR'S NOTE.—The foregoing is reproduced from Sir Henry Drayton's judgment in the Eastern Freight Rates case, recently, a summary of which was published in Canadian Railway and Marine World for August.)

Bridge Floor With Old Rails for Outside Guards.

Steel guard rails for bridge floors, placed outside the track rails and used instead of the usual guard timbers, are standard practice for bridges and trestles on the Atlanta and West Point Rd. and the Western Ry. of Alabama. Old rails are used, laid on their sides, with the base 10 in. clear from the base of



Old Rail Guard on Railway Bridge.

track rails, as shown in the accompanying drawing. At the ends of the bridge the guard rails are flared away from the track. Each guard rail is fastened to every tie by a $\frac{3}{4}$ in. lagscrew 8 in. long. No inside guard rails are used. This construction has been followed for some years with satisfactory results, and in cases of derailed trucks it has guided them safely across the structure.

South African Railways are administered by a newly constituted railway board, which came into existence June 1. In addition to the railways previously operated by the Union of South Africa, those running through the recently acquired territory, formerly known as German Southwest Africa, are subject to the Board's jurisdiction, subject to military authority, which still obtains in the conquered territory. The former German lines total 1,319 miles, and there are also 315 miles of privately owned lines. These are all of a variety of gauges, from 2 to $3\frac{1}{2}$ ft. The Board meets once a month, the Minister of Railways presiding, and acts chiefly in an advisory capacity. Should the Minister not follow the advice tendered by the Board, on matters within its competence, he must state his reasons for not doing so to Parliament. Opinion is expressed that as these latter railways will be operated at a loss for some time, they should be at the cost of the Defence Department, until a settlement is arrived at as to the terms on which they shall be incorporated in the South African railway system.

Thunder Bay Terminal Elevator Co., Ltd., has been incorporated under the Dominion Companies Act, with \$1,000,000 capital, and offices at Winnipeg, to carry on a general elevator and grain warehouse business, and to own and operate steam and other vessels, docks, wharves, etc. C. B. Piper, H. Phillips, C. S. A. Rogers, W. M. Shaw, and K. B. Armstrong, Winnipeg, are the incorporators.

Canadian Car Service Bureau.—At the recent annual meeting at Montreal, the C.P.R., G.T.R., Central Vermont Ry., Toronto, Hamilton & Buffalo Ry., Quebec Central Ry. and Canadian Government Railways, were elected members of the executive board, and W. J. Collins was reappointed Manager for the current year.

Among the kinds of trespass on railways complained of by the Intercolonial Ry. is the practice of driving horses along the track. Near Campbellton, N.B., recently, a freight train was wrecked in stopping to prevent it running into a number of horses which were being driven on the track. The trespassers are being prosecuted.

Thermit Welding and its Application at Transcona Shops, National Transcontinental Railway.

By S. Lewis, Master Blacksmith, National Transcontinental Railway.

The technological aspect and importance of thermit reaction can hardly be over-estimated, being a branch of aluminothermics, a science only in its infancy, and which has been taken up so rapidly by the steel industries of Canada and

stand great changes in temperature.

Thermit may be well termed a new kind of fire, a fire that is different from all other varieties of fire. In its combustion thermit is not air consumed, nor is there any gas evolved, as in the case

of thermit, that a heat density is produced unattainable otherwise. Thermit would therefore be of no practical use were it not for these peculiarities in its behavior.

The thermit process of welding as ap-



Fig. 1.—Cast iron boring bar of vertical boring mill.

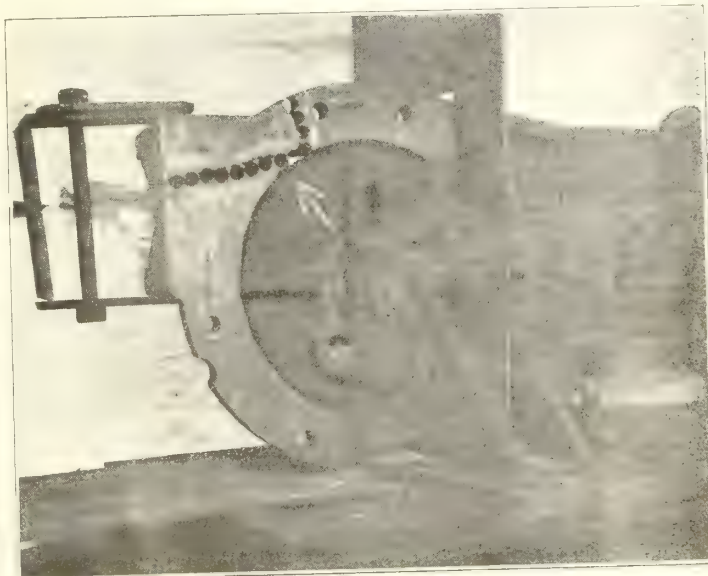


Fig. 2.—Quadrant of vertical boring mill.

the United States that a knowledge of it is nowadays indispensable. Already thermit reaction serves for the preparation of a number of pure metals and alloys of considerable value in the iron and steel and allied industries. Among

of wood, coal, gas, or any other kind of flammable combustion. Its heat density is also high and violent, and of such a peculiar nature that its application for welding purposes has been determined for industrial use with success. Then

plied to railway locomotive and machine repair, particularly in the welding of frames, and other heavy sections, maintains its advantage in the factors of time, portability in manipulation, simplicity of apparatus required, and its convenience in the smaller outlying points of modern facilities. At the Transcona shops ordinary locomotive frame fractures are thermit welded in from about 4½ to 6 hours, from start to pour, and mould boxes to accommodate all required shapes are built up from adjustable scrap boiler plate specially designed to suit the job, and which form part of the welding outfit. The thermit process is one of the oldest of autogenous welding in the railway shop, although there have even here, been recent improvements and changes affecting details, which have brought about further improvements and economy. Special railway thermit can now be obtained, already mixed with proper proportions, thus relieving the individual

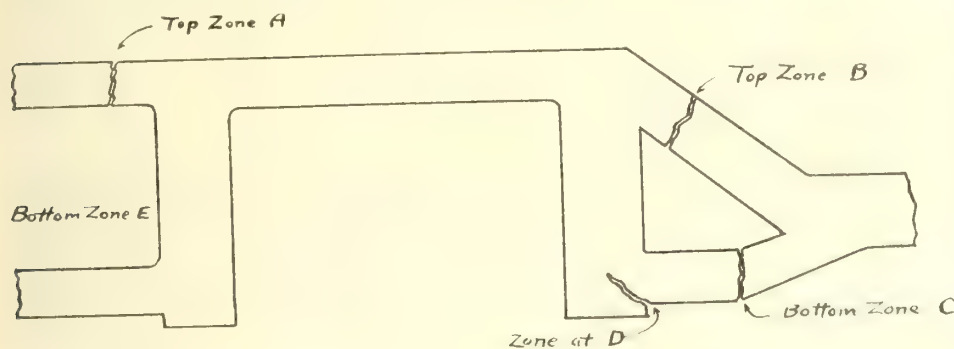


Fig. 3.—Welding of locomotive 427.

the alloys I may mention chromium (98 to 99% pure), which is used extensively in the manufacture of high speed tool steel and armor plate. Other alloys I may mention are chromium-manganese, manganese-titanium, ferro-titanium, ferro-vanadium, and ferro-boron.

In foundry work thermit, containing a small quantity of titanium-oxide, is used to prevent blowholes, and to give clean, dense castings. The fluidity of the metal is increased, producing a finer grain and decreasing the sulphur contents, the slag rising to the top can be removed very easily. It has also been discovered that, from the reaction of chromium under thermit, minute rubies are found in the slag, but being so small, they are of no commercial value. The slag itself, being free from metallic impurities, is mixed with certain clay, burned and manufactured into chemical apparatus, which can

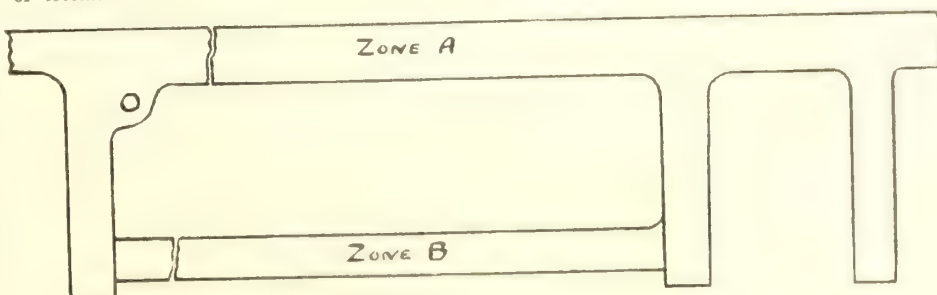


Fig. 4.—Welding of locomotives 405 and 634.

again, that the actual amount of heat obtainable from a given weight of thermit is much less than that from the same weight of anthracite has been demonstrated, but the reaction between quantities of iron oxide and aluminum is so instantaneous, caused by the combustion

in charge entirely from what previously was one of the most important features in securing good results.

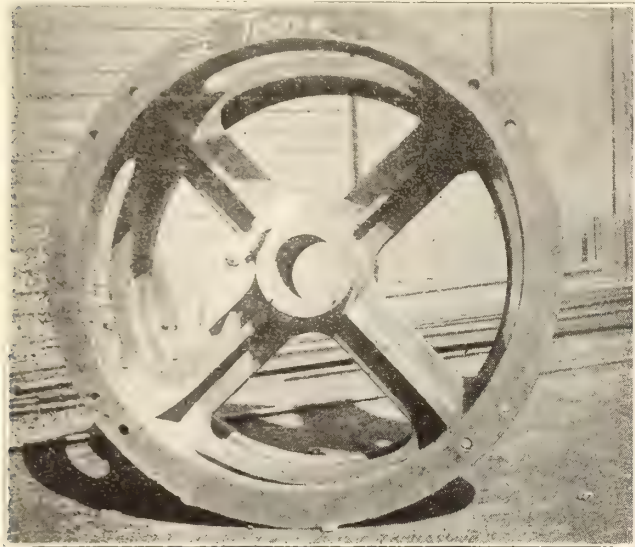
Too much emphasis cannot be placed on the value of using good moulding material. It should always be remembered that on account of the high tem-

perature of the thermit steel, it being 5400 deg. Fahr., it will cut the moulding material if the ingredients are of poor quality, or if they are not carefully selected and properly mixed together. Even in cases where the moulding material, while poor in quality is yet sufficiently refractory to prevent the thermit from running out, the resulting weld will be anything but satisfactory. Upon close inspection it will be found that the moulding material has been carried into the metal, impairing its value and possibly spoiling the weld. Sand containing from 96 to 98½ silica, such as used

tice they cannot expect to obtain satisfactory results. It should be remembered also that the same precautions should be taken in thermit welding as are observed in the best regulated steel foundries, especially in regard to the construction of venting, gating, providing the proper number of risers and the mould properly arranged, so that the parts may be preheated evenly and thoroughly and the crucible properly tapped. Let me point out that this is a decided advantage that does not hold for any other class of autogenous welding, as results are always dependent on the skill of the operator, as

and a tensile strength of about 60,000 lb. per sq. in., with elongation of from 11 to 15%, which is considered very good for cast steel.

The question of expansion and contraction, not only on locomotive frames but on all other sections where the contraction is affected by thermit welding, is one of great importance. A great many men regard the words "expansion and contraction" purely as relative, and they do not give the matter the consideration it should have. There is no fixed law regarding the exact amount of expansion on any piece of work, be it iron, steel,



by the steel foundries, when available, should be mixed, two parts of sand and one part of good fire clay.

Although great importance is attached to the moulding material, no less attention should be given to the preheating system. From personal observation sometimes I have found, upon machining thermit welds, that the metal is not perfectly solid, containing blowholes, impairing the strength of the weld greatly. Now from experience I have found this can be avoided. Do not assume for one moment that this fact is peculiar to the thermit process and cannot be avoided. Welding with thermit is essentially the same as making a steel casting, the process of reasoning will apply to both cases in so far as the conditions are the same. The chief cause of blowholes in steel castings is the presence of ferrous oxide in the metal, this is removed by adding some very active deoxidizer such as aluminum manganese or silica. Thermit itself is a mixture of iron oxide and aluminum, in such relative proportions as to reduce the oxide, and the manganese added to the thermit is to reduce all oxides which may be present in or on the parts to be welded, so it is evident that blowholes which may occur in thermit welds cannot arise from this cause. I am satisfied from past experience that if the parts that are to be welded are not heated or brought to a high temperature before the thermit steel is poured, the small portion of thermit steel coming in contact with the larger amount of comparatively cold metal, which at once conducts away the heat of the former so rapidly at the junction of the two metals, it becomes so thick and the shrinkage so severe that it results in blowholes. These precautions I make mention of, as the tendency by a great number of men doing this class of work is to overlook the fact that unless all the work done be in accordance with standard thermit prac-

there are no fixed rules laid down, such as there are in thermit welding.

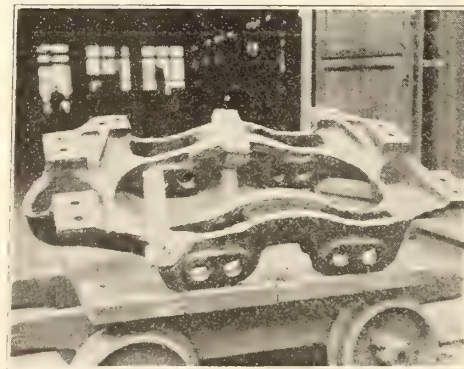
Let us consider the reinforcement provided around the welded section. I have heard a great deal of comment about this reinforcement, as if it was something to help the welded part, which was not satisfactory and could not be depended upon without it. If I understand thermit at all, this reinforcement is simply put on in order that sufficient heat may be concentrated around the part to be adhered or welded with thermit steel. This may be cut away providing it is neces-

or cast iron, but practical knowledge and experience is just as safe a guide as will ever be needed along this line.

We will take the following locomotives which have recently been welded at Transcona shops: On locomotive 427 four welds were made. See fig. 3. Following are particulars of the locations of the fractures and of the methods adopted:—

Top zone A. When the 3rd weld was made the zone at E was heated after crucible had been tapped.

Bottom zone C. First weld was made at zone C, zone B was cut open 1 in.



sary, without affecting or impairing the strength of the welded parts. This is not an assumption on my part.

The accompanying fig. 1 is a cast iron boring bar of a 6 ft. vertical boring mill which was repaired in 1913, under my own care, and fig. 2 is a quadrant belonging to the same, which had to be machined and cleaned before assembling. This mill has been doing heavy work, such as boring steel tires and cylinder rings since repaired. A recent test on a riser that was cut off, which is considered the poorest part of any resulting thermit steel weld, showed a fine granular structure

wide, front end was jacked up, expanding from 3/16 in. After 3 hours jack was lowered to normal condition.

Zone at D. In welding D heat was applied at C.

Top zone B. Second weld was made at zone B, jacks were lowered at front of locomotive and secured an expansion of 3/32.

Following are particulars of work on locomotives 405 and 634. See fig. 4. On locomotive 405 zone B was heated. On locomotive 634 zone A was heated.

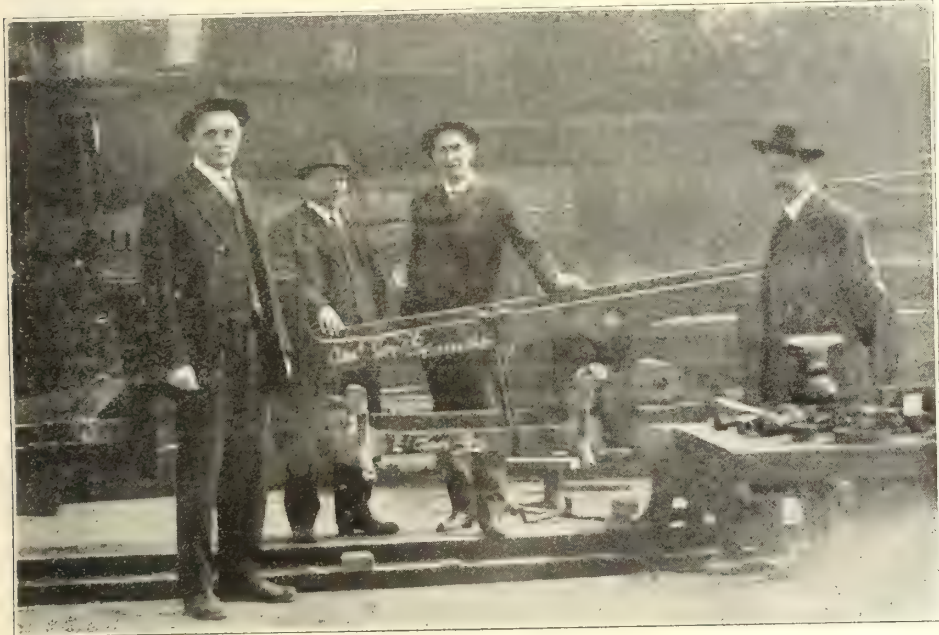
Experience has already shown the advantage of the thermit process over other

methods and the future alone will doubtless draw still more distinct lines around this individual field of usefulness and economy. Following is a statement of comparative cost of thermit welds:—

Locomotive 405.—Labor \$5.00, one weld; material \$15.60; total \$20.60.

Locomotive 212.—Labor \$14.64, four welds; material \$38.00; total \$52.64.

Locomotive 427.—Labor \$15.60, four welds, material \$40.00, total \$55.64.



Locomotive 634.—Labor \$5, one weld; material \$15.60, total \$20.60.

(EDITOR'S NOTE.—The other illustrations, not particularly referred to in the foregoing article, show thermit welds done by S. Lewis, at Transcona.

Canadian Government Railways' Elevator at St. John.—Plans for an elevator to be erected in St. John, N.B., by Canadian Government Railways, were considered by the city council recently. Some objection had been taken to the original plans, as it was claimed that traffic on Water St. would be blocked and access to the Lower Cove Basin prevented. J. K. McNeillie, General Superintendent, stated that it was the intention to provide an elevator of 500,000 bush. capacity, so arranged that it could be increased to 1,000,000 bush. when desirable. New wharves will be built, and later, the grain conveyors will be removed from their present location.

The Minneapolis, St. Paul & Sault Ste. Marie Ry. has awarded contracts for the construction of a reinforced concrete ore dock at Ashland, Wis., for a total capacity of 60,000 tons. It will be 900 ft. long with four tracks 80 ft. above water level. Including the dock head, the reinforced concrete portion of the structure will be 1,132 ft. long.

The Mutual Grain Co., Ltd., has been incorporated under the Dominion Companies Act, with \$199,000 authorized capital and office at Winnipeg, to carry on a general grain elevator, warehouse and milling business, and in connection therewith to own and operate grain elevators, steam and other vessels, etc.

The C.P.R. has increased the wages paid to machinists, boiler makers, pipe fitters, car men, electrical and sheet metal workers, on its lines east of Fort William, Ont., by 8%, and has also granted improved working conditions which it is said are equal to a further 25%.

Many happy returns of the day to:—

G. W. Alexander, Local Treasurer, G.T.R., Western Lines, Detroit, Mich., born at Lightcliff, Yorks., Eng., Sept. 10, 1859.

H. Bailey, Bridge and Building Master, National Transcontinental Ry., Parent,

Signal Oil Co., Ottawa, Ont., born at Drummondville, Que., Sept. 12, 1856.

R. S. Gosset, Auditor of Disbursements, Canadian Northern Ry., Toronto, born there, Sept. 28, 1879.

E. Goulet, Agent, C.P.R., New Westminster, B.C., born at Quebec, Que., Sept., 1865.

John Gray, General Agent, G.T.R., Toronto, born at River Beaudette, Que., Sept. 28, 1863.

D. W. Hatch, Travelling Agent, Atchison, Topeka and Santa Fe Ry., Montreal, born at Bedford, Que., Sept. 1, 1841.

W. B. Howard, District Passenger Agent, C.P.R., Toronto, born at Chatham, N.B., Sept. 15, 1877.

W. R. Howard, Chief Dispatcher and Trainmaster, District 1, Atlantic Division, C.P.R., Brownville Jct., Me., born at St. Andrews, N.B., Sept. 14, 1871.

E. Humphreys, Storekeeper, C.P.R., Winnipeg, born at Hull, Eng., Sept. 24, 1869.

J. E. Hutcheson, General Manager, Montreal Tramways Co., Montreal, born at Brockville, Ont., Sept. 15, 1858.

C. B. King, Manager, London St. Ry., London, Ont., born at Galena, Ind., Sept. 12, 1871.

S. King, ex-Superintendent, Canadian Car and Foundry Co., director, National Steel Car Co., now of London, Ont., born at Thetford, Norfolk, Eng., Sept. 12, 1853.

R. E. Larmour, General Agent, Freight Department, C.P.R., New York, born at Brantford, Ont., Sept. 26, 1868.

H. D. Lumsden, M.Can.Soc.C.E., Engineering Department, C.P.R., Toronto, born at Belhaire, Scotland, Sept. 7, 1844.

G. S. Lytle, Car Service Agent, Manitoba Division, C.P.R., Winnipeg, born at Dennison, Ia., Sept. 23, 1878.

C. D. MacKintosh, Superintendent, District 1, Alberta Division, C.P.R., Medicine Hat, born at Auckland, New Zealand, Sept. 24, 1882.

F. J. Mahon, Inspector of Telegraphs, Saskatchewan Division, C.P.R., Saskatoon, born at Montreal, Sept. 18, 1865.

W. A. Mather, Assistant General Superintendent, British Columbia Division, C.P.R., Vancouver, born at Oshawa, Ont., Sept. 1885.

J. F. Mundle, City Freight Agent, C.P.R., Montreal, born at Prescott, Ont., Sept. 20, 1857.

M. B. Murnhy, Superintendent, District 2, Central Division, Canadian Northern Ry., Winnipeg, born at Napa, Cal., Sept. 11, 1866.

J. Paul, District Freight Agent, Canadian Northern Ry., Winnipeg, born in Euphrasia Tp., Ont., Sept. 13, 1858.

W. J. Pickrell, Master Mechanic, Ontario Division, C.P.R., Toronto, born at London, Ont., Sept. 15, 1880.

W. D. Robb, Superintendent of Motive Power, G.T.R., Montreal, born at Longueuil, Que., Sept. 21, 1857.

H. T. Ruhl, Division Engineer, Canadian Government Railways, Moncton, N.B., born at Mifflinburg, Pa., Sept. 29, 1882.

A. Scott, Resident Engineer, Prince Edward Island Ry., Charlottetown, P.E.I., born at Kirkcaldy, Scotland, Sept. 6, 1884.

J. M. Silliman, Resident Engineer, District 3, Eastern Division, C.P.R., Montreal, born at Easton, Pa., Sept. 8, 1885.

H. A. Young, Ontario Storage and Cartage Co., Ltd., Toronto, born at Brooklyn, N.Y., Sept. 1, 1864.

Que., born at Huntsville, Ont., Sept. 2, 1879.

W. B. Bamford, District Freight Agent, C.P.R., Toronto, born at Belleville, Ont., Sept. 10, 1863.

G. T. Bell, Passenger Traffic Manager, G.T.R., Montreal, born there, Sept. 7, 1861.

W. H. Biggar, K.C., Vice President and General Counsel, G.T.R., and G.T.P.R., Montreal, born at The Carrying Place, near Trenton, Ont., Sept. 19, 1852.

E. J. Blais, Foreman Tinsmith, National Transcontinental Ry., Transcona, Man., born Sept. 26, 1876.

E. R. Bremmer, ex-Division Freight Agent, Ottawa Division, G.T.R., Ottawa, born at Toronto, Sept. 9, 1875.

M. H. Brown, Division Freight Agent, Ontario Division, C.P.R., Toronto, born at Victoria Square, Ont., Sept. 2, 1866.

W. B. Bulling, ex-Assistant Freight Traffic Manager, Eastern Lines, C.P.R., Montreal, born there, Sept. 16, 1858.

W. E. Burke, Assistant Manager, Canada Steamship Lines, Ltd., and President, Dominion Marine Association, Toronto, born at Belleville, Ont., Sept. 23, 1881.

A. D. Cartwright, Secretary, Board of Railway Commissioners, Ottawa, born at Kingston, Ont., Sept. 30, 1864.

A. S. Dawson, M.Can.Soc.C.E., Chief Engineer, Department of Natural Resources, C.P.R., Calgary, Alta., born at Pictou, N.S., Sept. 6, 1871.

W. E. Duperow, Assistant General Passenger Agent, Grand Trunk Pacific Ry., Winnipeg, born at Stratford, Ont., Sept. 4, 1872.

W. H. Estano, Traffic Auditor, Intercolonial Ry., Moncton, N.B., born at Halifax, N.S., Sept. 29, 1874.

C. B. Foster, Assistant Passenger, Traffic Manager, Eastern Lines, C.P.R., Montreal, born at Kingston, N.B., Sept. 30, 1871.

J. P. Ferguson, representing Galena

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were drawn.

General order 167. July 3.—Authorizing railway companies operating in Eastern Canada to increase freight rates on various classes of general merchandise and commodities between points east of Port Arthur, Ont., in accordance with judgment dated June 9. Summary of which was published in our August issue.

General order 169, July 27.—Ordering that railway companies subject to Board's jurisdiction furnish Board and bodies enumerated in general order 153, Nov. 4, 1915, with statement showing all changes made in rules of proposed Canadian Freight Classification 17, grounds upon which they are sought to be justified, and results such changes would make on traffic in eastern and western Canada respectively.

25171. July 17.—Authorizing G.T.R. to build spur for St. Catharines Steel & Metal Co., St. Catharines, Ont.

25172. July 17.—Amending order 25085, June 19, re C.P.R. spur in Lots 56 to 58, Kildonan Parish, Man.

25173. July 18.—Approving changes in Canadian Northern Ry., location at Osgood, Sask.

25174. July 18.—Authorizing Toronto, Hamilton & Buffalo Ry. to build spur for Laidlaw Bale Tie Co., Hamilton, Ont.

25175. July 18.—Authorizing C.P.R. to build road diversion on its Swift Current Southeasterly Branch in s.w. ¼ Sec. 29-15-13 w. 3 m. Sask., and to close within its right of way the existing roadway at mileage 0.2, Vanguard Subdivision.

25176. July 17.—Authorizing C.P.R. to build spur at mileage 67.6 on London Subdivision, crossing Ayr and Waterloo road by bridge, and to divert highway and use same for one month from date.

25177. July 17.—Ordering Bell Telephone Co. to lay conduit on Queen St., Berlin, Ont., from Queen St. South, between Church St. and Schneider's Creek; to be completed by Sept. 15, and within 3 years from date, poles to be removed from said street and wires placed upon private right of way provided by City of Berlin, on both sides of Queen St.

25178. July 24.—Authorizing Edmonton, Dunvegan & British Columbia Ry. to open for traffic its Grande Prairie branch from mileage 0 to 50.19; trains not to exceed 15 miles an hour.

25179. July 24.—Amending order 25063, June 13, re road building at Canadian Northern Ry. station at Menzie, Man.

25180. July 24.—Authorizing Vancouver, Victoria & Eastern Ry. & Navigation Co. to connect its line with Canadian Northern Pacific Ry. at Sumas Landing, B.C.

25181. July 24.—Dismissing application Ben-Nevis Collieries, Nevis, Alta., for order directing C.P.R. to continue service on spur formerly operated by Turnbull & Cousins.

25182. July 24.—Dismissing Crawford Bay Farmers' Institute's complaint against C.P.R. rates and service to Crawford Bay, B.C.

25183. July 24.—Ordering C.P.R. to build highway crossing at mileage 69 west of Moose Jaw, Sask., in accordance with Board's standard regulations.

25184. July 24.—Ordering C.P.R., within 60 days to install improved type automatic bells at Crawford's and Pardy's crossings, at mileage 13.55, between Westfield and Hillandale, N.B., 20% of cost to be paid out of railway grade crossing fund.

25185. July 25.—Authorizing C.P.R., temporarily, to build extension to lead spur at Port Arthur, Ont., for taking in construction material for Grain Growers' Elevator Co.'s and Saskatchewan Co-operative Elevator Co.'s elevators.

25186. July 22.—Authorizing C.P.R. to build spur for Roelofs Machine Tool Co., Galt, Ont.

25187. July 22.—Authorizing C.P.R. to build connection to Imperial Oil Co.'s siding which connects with G.T.R. at boundary between n.w. ¼ Sec. 29 and s.w. ¼ Sec. 32-17-19, w.2m., Sask.

25188. July 24.—Dismissing application of Great West Coal Co., Edmonton, Alta., for order directing Grand Trunk Pacific Ry. to rebate \$31,189.30.

25189. July 24.—Dismissing complaint of Clover Bar Coal Co., Edmonton, Alta., against Grand Trunk Pacific Ry. rates on eastbound coal from Clover Bar mine.

25190. July 22.—Authorizing G.T.R. to build spur for Beachville White Lime Co., Oxford North Tp., Ont.

25191. July 25.—Extending to Aug. 10 time within which Grand Trunk Pacific Branch Lines Co. shall complete transfer and storage track at Battleford, Sask., with Canadian Northern Ry.

25192. July 25.—Ordering Canadian Northern Ry. to appoint station agent at Merid, Sask., by Sept. 1; agent to be retained until further order.

25193. July 22.—Approving Canadian Northern Ontario Ry. location through McGregor Tp., Thunder Bay District, mileage 548.45 to 568.13.

25194. July 25.—Dismissing Saskatchewan Department of Agriculture's complaint against charge made by Canadian Northern Express Co. on shipments of cream in cans.

25195. July 22.—Authorizing Canadian Northern Ontario Ry. to build spur for Graves, Bigwood Co., Hennessy Tp.

25196. July 24.—Rescinding order 23955, June 22, 1915, re Canadian Northern Ry. standard wire stock pen.

25197, 25198. July 24.—Approving agreements between Bell Telephone Co. and Stormont Telephone Co., July 5, and Euphrasia Tp., Ont., June 30.

25199, 25200. July 21, 22.—Authorizing City of Hamilton, Ont., to widen Dewey St., from 30 to 66 ft. across Hamilton Radial Ry. and G.T.R., in Lot 6, Con. 1, Barton Tp.

25201. July 22.—Authorizing C.P.R. and St. John Ry. to operate trains and cars over crossing on Douglas Ave., St. John, N.B., without first stopping; speed not to exceed 10 miles an hour.

25202. July 24.—Authorizing City of Edmonton, Alta., to build its street railway across Grand Trunk Pacific Ry. at intersection of 27th St., between Armstrong and Cochrane Ave., under supervision of G.T.P.R. engineer, and to insert diamond in G.T.P.R. at said crossing; half interlocking plant to be installed, question of maintenance cost reserved.

25203, July 24.—Ordering G.T.R. to stop west-bound train 37 at Malton, Ont., on flag, for passengers from Toronto or points east.

25204. July 26.—Authorizing C.P.R. to put into effect by Aug. 1, following train service,—train 615, Kingston to Renfrew, Mondays, Wednesdays and Fridays; 616, Renfrew to Kingston, Tuesdays, Thursdays and Saturdays—on same time schedule as published in summer timetables.

25205. July 26.—Ordering railway companies which, on May 18, increased minimum carload weight applicable to lumber and articles taking lumber rates from points of shipment in British Columbia and Alberta, when loaded in cars under 36 ft. long, from 30,000 to 35,000 lbs., to modify increased minimum by providing minimum weight of 30,000 lbs., for cars of 2050 cub. ft. or less capacity; said modification to be published and filed immediately upon receipt of this order, and, to destinations in Canada, to be made effective forthwith.

25206. July 26.—Approving clearances at siding for Seaman Kent Co., Meaford, Ont.

25207. July 26.—Authorizing Mackenzie, Mann & Co., to build Third St. West over Canadian Northern Ry. at Eston, Sask.

25208. July 22.—Ordering Grand Trunk Pacific Ry. forthwith to build siding for elevator site at St. Louis, Sask., in substitution of siding referred to in order 22784, Oct. 30, 1914.

25209. July 22.—Authorizing Canadian Northern Ontario Ry. to build spur from mileage 26.8, Parry Sound Subdivision, southeasterly through Lot 13, Con. 4, Burton Tp., for 772 ft.

25210. July 22.—Ordering Esquimalt & Nanaimo Ry. within three months to install improved type of automatic bell at Lampton St., Esquimalt Tp., 20% of cost to be paid out of railway grade crossing fund.

25211. July 27.—Suspending, until further order, increased rates on ores and concentrates, in C.P.R. Tariff C.R.C. no. W-2168, effective Aug. 1, from points in British Columbia.

25212. July 22.—Dismissing application of farmers in the vicinity of Greenshields and Wainwright, Alta., for order directing Grand Trunk Pacific Ry. to build siding at crossing near mileage 659, n.e.¼ Sec. 7-44-5.

25213. July 27.—Amending order 25083, June 17, re City of Toronto's overhead crossing of C.P.R. east of Strachan Ave.

25214. July 27.—Authorizing G.T.R. to cancel slow order at crossing of public road near Lyn, Ont.

25215. July 22.—Authorizing G.T.R. to build branch with spurs and team tracks and Y connecting with main line, near Angus, thence about 4 miles to Camp Borden, and approving span diagram carrying Y over Pine River, and also location of station at camp.

25216. July 28.—Authorizing C.P.R. to build diversion in lieu of original road allowance between Secs. 17 and 18-39-2, w.4m., near Provost, Alta.

25217. July 26.—Relieving Canadian Northern Ry. from providing further protection at highway crossing near Camrose Jet., Alta.

25218. July 26.—Authorizing Grand Trunk Pacific Ry. to build highway over its track in s.w.¼ Sec. 29-53-8, w.5m., Alta.

25219. July 26.—Authorizing Ontario Government to build highway on trunk road across C. P. R. west of North Bay, near Meadowsdale.

25220. July 29.—Authorizing Kett'e Valley Ry. to open for traffic its line from Brodie, 13.2 miles east of Coquihalla Summit, to a connection with C.P.R. main line at Petain, west of Hope station, B.C., mileage 112.3 to 165.2; speed of trains between mileage 130 and 136 not to exceed 15 miles an hour.

25221. July 29.—Authorizing G.T.R. to build siding for Canadian Milk Products, Ltd., Burford Tp.

25222. July 29.—Authorizing G.T.R. to lay additional track across South St., Preston, Ont.

25223. July 29.—Authorizing Kettle Valley Ry. and Canadian Northern Pacific Ry. to operate over crossing at Hope, B.C., without first stopping trains.

25224. July 31. Authorizing Vancouver, Victoria & Eastern Ry. & Navigation Co. (G.N.R.) to join with Kettle Valley Ry. and Canadian Northern Pacific Ry. at places shown on plan and to cross and divert certain avenues and streets in Hope, B.C.

25225. July 31.—Ordering that Vancouver, Victoria & Eastern Ry. & Navigation Co. (G.N.R.) pay to City of Vancouver, B.C., \$50,000 on account of work done under orders relating to construction of Pender and Hastings St. viaducts, without prejudice to railway company or any objection it may desire to make to any of items of the account.

25226. July 31.—Approving agreement between Bell Telephone Co. and South Crosby Rural Telephone Co., Leeds, Ont., July 20.

25227. July 27.—Amending order of Oct. 12, 1904, re G.T.R. crossing of C.P.R. near Woodstock, Ont.

25228. July 31.—Ordering C.P.R. to stop trains before crossing Twelfth St., New Westminster, B.C., trains to be flagged over crossing by trainmen.

25229. July 31.—Authorizing C.P.R. to build 1,000 ft. spur and 500 ft. switching track for Wentworth Orchard Co., and 210 ft. extension to spur for Slater & Copp, Flamboro Tp., Ont.

25230. Aug. 1.—Authorizing C.P.R., Canadian Northern Ry. and Grand Trunk Pacific Ry. to revise distributing or "town" tariff rates from Winnipeg, Portage la Prairie and Brandon, to conform to basis laid down in Board's judgment, Apr. 6, 1914, as applicable from distributing centres in Saskatchewan and Alberta.

25231. July 29.—Ordering Pere Marquette Rd. to change time of train leaving Chatham, Ont., at 8.05 p.m. and arriving at Sarnia, Ont., at 10.15 p.m., daily, except Sunday, to leave Chatham at 6.35 p.m. and arrive at Sarnia at 8.45 p.m.; time at intermediate stations to be changed accordingly; service to be in effect Aug. 14, and P. M. R. to report result to Board by Nov. 15.

25232. July 31.—Ordering Great North Western Telegraph Co., pending further order, to restore telegraph tolls charged prior to July 1, from Pas. Man., and to file amendments to its tariff accordingly.

25233. Aug. 1.—Extending for three months from date time within which Canadian Northern Ry. shall complete spur to serve block B, plan B, Prince Albert, Sask.

25234. July 31.—Authorizing Winnipeg Electric Ry. to build across C.P.R. spur to Hero Mfg. Co., on Levis St., Winnipeg.

25235. July 25.—Authorizing Saskatchewan Highway Commissioners to build highway over Grand Trunk Pacific Ry. Regina-Boundary Branch in s.e.¼ Sec. 22-12-16, w.2m.

25236. Aug. 3.—Ordering Grand Trunk Pacific Ry. to appoint station agent at Lawson, Sask., by Sept. 1.

25237. July 31.—Authorizing Canadian Northern Ry. to remove station agent at Stoco, Ont., pending further order, caretaker to be appointed to meet passenger trains, keep station clean and heated, and see that l.c.l. freight and express matter is properly housed.

25238. July 18.—Authorizing Toronto and Hamilton Highway Commissioners to cross G.T.R. at Burlington, Ont.; Hamilton Radial Ry. at Maple Ave., and to divert highway along Water St. and across G.T.R., and Toronto & Niagara Power Co.'s wires.

25239. Aug. 1.—Ordering Grand Trunk Pacific Branch Lines Co., pending further order to stop its trains before crossing Twelfth St., Calgary, Alta.

25240. Aug. 2.—Authorizing C.P.R. and Canadian Northern Ontario Ry. to operate over crossing at Russell Road, Gloucester Tp., without first stopping trains.

25241. Aug. 2.—Authorizing City of Port Moody, B.C., to extend Fraser St. across C.P.R. at mileage 115.2, Cascade Subdivision.

25242. Aug. 1.—Ordering Canadian Northern Ry. to build roadway to Woodnorth, Man., C.N.R. to be liable for acquisition of necessary property to extent of \$25 an acre, and to build fence on south boundary; any sum over \$25 an acre that C.N.R. is put to by acquisition of property to be paid by Pipestone rural municipality, Man.

25243. Aug. 1.—Rescinding order 24733, Feb. 17, re clearances at country elevators on railways.

25244. July 28.—Ordering Quebec & Lake St. John Ry. (C.N.R.) to build station at Chicoutimi, Que., within one year from date.

25245. Aug. 3.—Authorizing Canadian Northern Ry. to build transfer track with C.P.R. at Basque, B.C.

25246. July 27.—Ordering Quebec Oriental Ry., by Oct. 15, to build shelter, with waiting and freight rooms, about midway between Caplin and Bonaventure, Que.

25247. July 26.—Dismissing application of City of St. Hyacinthe, Que., to open St. Joseph St. across G.T.R.

25248. Aug. 2.—Approving re-numbered Supplement 8 to Express Classification for Canada 3, applying on shipments of ale, beer, wine, whiskey, and other alcoholic liquors or beverages packed in barrels, kegs, or wooden or corrugated board boxes.

25249. Aug. 3.—Ordering C.P.R. and Canadian Northern Ry. to refund Doucet & Freres, Grand Piles, Que., $\frac{1}{2}$ ¢. per 100 lbs., on shipments of brick to Shawinigan Falls and Grand Mere, on which 4¢. per 100 lbs. has been charged.

25250. Aug. 3.—Dismissing complaint of F. L. Getzler, Montreal, against 10th class rate of 16¢. on pig iron in carloads from Welland, Ont., to Montreal.

25251. Aug. 5.—Rescinding order 24994, May 22, which suspended certain tariffs showing charges for heated refrigerator cars provided that sec. 3 shall apply only when loading is done by shippers and that sec. 4 be eliminated.

25252. Aug. 4.—Approving Chatham, Wallaceburg and Lake Erie Ry. bylaw 12, authorizing W. J. Curle, General Superintendent, to issue tariffs of tolls.

25253. Aug. 8.—Authorizing Canadian Northern Ontario Ry. to build spur for Toronto Builders Supplies, Ltd., Toronto.

25254. Aug. 11.—Suspending until further order, item 8-B in Supplement 5, to F. G. Airy's tariff C.R.C. 1972, which provides for the cancellation of the arrangement whereby fish in carloads is carried by express at net weight from Edmonton, Alta., to U. S. points and continuing in effect item 8-A in Supplement 4, to C.R.C. 1972.

25255. Aug. 11.—Suspending until further order increased rates on crushed stone from Hagersville to Windsor and Pelton, Ont., shown in supplement 12, to Michigan Central Rd. tariff C.R.C. 2490.

25256. Aug. 10.—Approving Grand Trunk Pacific Ry. station and site at Riverhurst, Sask.

25257. Aug. 11.—Rescinding order 23231, Feb. 2, 1915, suspending certain New York Central Rd. and Ottawa & New York Ry. tariffs and authorizing companies to publish tariffs between points in Canada in accordance with the recent judgment in the so-called Eastern Rates Case.

25258. Aug. 11.—Approving location of new G.T.R. station at Mimico, Ont.

25259. Aug. 5.—Ordering G.T.R. to protect crossing of Drouillard Road, Walkerville, Ont., by day and night watchmen.

25260. Aug. 10.—Authorizing Vancouver, Victoria & Eastern Ry. & Navigation Co. (G.N.R.) to make certain changes in its railway near Sapperton, B.C.

25261. Aug. 11.—Approving agreement between Bell Telephone Co. and Bethesda & Stouffville Telephone Co., July 28.

25262. Aug. 16.—Suspending Supplement 15, to C.P.R. tariff E 2847, disallowing rates on pulpwood to Mechanicville.

25263. Aug. 15.—Authorizing Canadian Northern Ontario Ry. to build branch line for Cobourg Dyeing Co., Cobourg, Ont.

25264. Aug. 15.—Authorizing Canadian Northern Ontario Ry. to build spur to water front in Port Arthur.

25265. Aug. 15.—Authorizing G.T.R. to change position of one track across Albert St., Oshawa, Ont., and to build two additional tracks.

25266. Aug. 15.—Authorizing Canadian Northern Ontario Ry. to build spur for Field Lumber Co. Field Tp., Ont.

25267. Aug. 15.—Authorizing C.P.R. to build 65 ft. extension to Barrett's siding for C. H. Cochrane, Ottawa.

25268. Aug. 14.—Authorizing C.P.R. to make road diversions in s.e. $\frac{1}{4}$ Sec. 13, Tp. 34, R. 23, w.3.m., Sask., and at mileage 102.12 Kerrobert Subdivision, Sask.

25269. Aug. 14.—Relieving Niagara, St. Catharines & Toronto Ry. from providing further protection at crossing between lots 90 and 91, Stamford Tp., Ont.

25270. Aug. 14.—Authorizing Alberta Government to build two crossings over Grand Trunk Pacific Ry. at Cooking Lake.

25271. Aug. 15.—Ordering Canadian Northern Ry. to appoint station agent at Browning, Sask., by Sept. 1.

25272. Aug. 14.—Authorizing C.P.R. to build branch for Godson Contracting Co., Toronto.

25273. Aug. 8.—Authorizing G.T.R. to build branches for Hodgson Bros. Chemical Co., Lindsay, Ont.

25274. Aug. 14.—Authorizing C.P.R. to build switching lead and to re-arrange present switch lead across the main street in Farnham, Que.

25275. Aug. 14.—Extending for 3 months from date, time for completion of G.T.R. branch for B. Blair Co., Woodstock, Ont.

25276. Aug. 15.—Authorizing C.P.R. to build lead switch and 4 spurs also new spur for St. Maurice Paper Co., Cap de la Madeleine Parish, Que., also to build 2 tracks across public highway for same company.

25277. Aug. 14.—Authorizing Canadian Northern Ontario Ry. to cross Kingston St., Harrow-smith, Ont.

25278. Aug. 10.—Ordering C.P.R. within 60 days to install improved type of automatic bell at Antoine St. crossing, Rigaud, Que.

25279. Aug. 14.—Approving amendment to ex-

press classification 3, re shipment of fruit in baskets, to be effective Sept. 1, 1916.

25280. Aug. 16.—Recommending to Governor in Council for sanction agreement between C.P.R. and Canadian Northern Ry., Oct. 1, 1915.

25281. Aug. 17.—Authorizing Canadian Northern Ry. to build across highway between river lots 224 and 223, St. Andrew's Parish, Man.

25282. Aug. 17.—Ordering Canadian Northern Ry. to erect station at Krydor, Sask.

25283. Aug. 17.—Authorizing Canadian Northern Ry. to cross highway in river lot 79, St. Clement Parish, Man.

25284. Aug. 17.—Approving C.P.R. station and tower location and plans at Adirondack Jct.

25285. Aug. 18.—Authorizing G.T.R. to charge \$1 a car a day or part thereof, after three days, and \$2 a car a day for each succeeding day or part thereof, for detention of cars containing lumber and forest products at Sarnia, Ont., in addition to ordinary demurrage toll prescribed by general order 1.

25286. Aug. 18.—Relieving C.P.R. from providing further protection at crossing at Elmhurst Ave., Montreal West.

25287. Aug. 17.—Extending to Oct. 1, time within which the C.P.R. shall install gates at crossing of Dorchester St., Quebec.

25288. Aug. 17.—Approving C.P.R. plan of revision of interlocking plant at junction of St. Lawrence and Adirondack Ry. mileage 40.66 Farnham Subdivision, Que.

25289. Aug. 17.—Approving C.P.R. plan of changes in interlocking plant at Arnprior, Ont.

25290. Aug. 18.—Ordering Canadian Northern Ry. to build siding to hold not less than 7 cars at Alderdale, Ont., and a 10-car loading siding at Wasing, Ont.

25292. Aug. 18.—Authorizing City of Ft. William, Ont., to build crossing over Canadian Northern Ry., at Kingsway, Ont.

25293. Aug. 17.—Authorizing Canadian Northern Ry. to build transfer track with National Transcontinental Ry. at Empire Ave., Fort William, Ont.

25294. Aug. 18.—Authorizing G.T.R. to build two spurs for Dominion Government in Lindsay, Ont., south of Hamilton Street.

25295. Aug. 18.—Ordering G.T.R. to rebuild fence along its right of way in lot 134, Con. A and lots 134, 135, and 136 Con. B. Foley Tp., Ont.

25296. Aug. 17.—Authorizing Wainfleet Tp., Ont., to divert road so as to cross G.T.R. between east and west halves of lot 1, Con. 1.

25297. Aug. 18.—Approving Toronto, Hamilton & Buffalo Ry. bylaw authorizing G. C. Martin, G. F. & P. A., and R. F. Hill, A. G. F. & P. A., to issue tariffs of tolls.

General order 170, Aug. 5.—Rescinding after Sept. 1, general order 148, Sept. 1, 1915, which authorized railway companies in Alberta and Saskatchewan to endorse upon bills of lading amount of advances for seed grain, fodder for animals and other goods.

The Esquimalt & Nanaimo Ry.—The pioneer railway on Vancouver Island—was opened for traffic in the autumn of 1886, the last spike having been driven at Shawnigan Lake, Aug. 13, 1886. Construction was commenced in 1883, and was carried out under the charge of Joseph Hunter as Chief Engineer. He is now President of the Wellington Collieries Co., and of the Wellington Collieries' Ry.

Imperial Rolling Stock Co.—An agreement dated Aug. 1, made between the Imperial Rolling Stock Co., the Fidelity Trust Co., Philadelphia, Pa., and the Canadian Northern Ry., has been filed with the Provincial Secretary at Toronto. Under the agreement the Imperial Rolling Stock Co. assigns to the Fidelity Trust Co., the railway rolling stock and equipment issued to the Canadian Northern Ry. under a lease and agreement dated Aug. 1.

Rogers Pass Tunnel Suit.—We are advised that Foley, Welch and Stewart have deposited in court an accepted cheque for \$600,000 as directed by Justice Morrison. This is the necessary preliminary to the firm prosecuting an appeal against the amount of damages, \$576,155.98, found by the court as due to McIlwee & Sons, in the suit for breach of contract over the boring of the C.P.R. tunnel at Rogers Pass.

The Pere Marquette Rd., is reported to be negotiating with the St. Thomas, Ont., Hydro Electric Power Commission for the use of 160 h.p. of hydro electric power to replace its present steam plant.

Freight and Passenger Traffic Notes.

The first through train over the Kettle Valley Ry. arrived in Vancouver, B.C., Aug. 1.

"Resorts of the Canadian Rockies," is the title of a handsome tourist folder issued recently by the C.P.R.

The Canadian Northern Quebec Ry. through service which was stopped by the burning of the bridge at St. Ursule recently was restarted Aug. 17.

The Great Northern Ry. local ticket office has been removed to 918 Government St., Victoria, B.C., from its former location at the corner of View and Douglas Streets.

Geo. Porter has been appointed to handle the Canadian Northern Ry. cartage and distribution business in Saskatoon, Sask., in place of the Western Distribution Co.

The Union Pacific Rd., has arranged to give considerable attention to Victoria and Vancouver Island, in the publicity campaign now being carried on by its passenger department.

Local freight agents from the various Canadian railways met in Vancouver, B.C., recently and decided to organize the Canadian Association of Local Freight Agents.

The C.P.R., the Grand Trunk Pacific Ry., and the Canadian Northern Ry. are giving a 1¢ a mile rate for harvest hands from British Columbia to Alberta and Saskatchewan points, Aug. 1 to 18.

The C.P.R. is arranging for the provision of considerable special advertising matter descriptive of the attractions of the British Columbia coast, as reached by its railways and steamship lines.

The Victoria and Island Development Association carried out during the autumn of 1915 and the spring of 1916, a publicity campaign through the passenger and ticket agents of U. S. railways. The association now reports that good results have been achieved therefrom.

The Hamilton, Ont., City Council claims that the Grand Trunk Ry., under some old agreement, must provide a passenger service on its line from Hamilton to Burlington Beach. An application is to be made to the Beach Commissioners asking them to apply to the company to put on such a service, and in the event of refusal to make application to the Board of Railway Commissioners. The matter affects the summer traffic and the council desires to get it settled before the summer of 1917.

The Transportation Club of Vancouver has secured quarters at 553 Granville St., Vancouver. The officers are: Honorary President, R. Marpole; Honorary 1st Vice President, D. E. Brown; Honorary 2nd Vice President, H. W. Brodie; President, J. A. M. Faulds; Vice President, K. J. Burns; 2nd Vice President, C. E. Lang; 3rd Vice President, W. D. Power; Secretary Treasurer, H. W. Schofield.

Alaska Northern Ry.—Seward, Alaska, press dispatch, July 7:—"Final payment of \$650,000 has been made by the United States Government to Canadian bondholders for the old Alaska Northern Ry., thus completing the Government's title to this property, which was taken over as part of the federal railways between Seward and Fairbanks."

The Timiskaming & Northern Ontario Ry. Patriotic Association has, up to date, contributed \$27,358.11 to various patriotic funds, about a quarter of which was sent direct to men at the front.

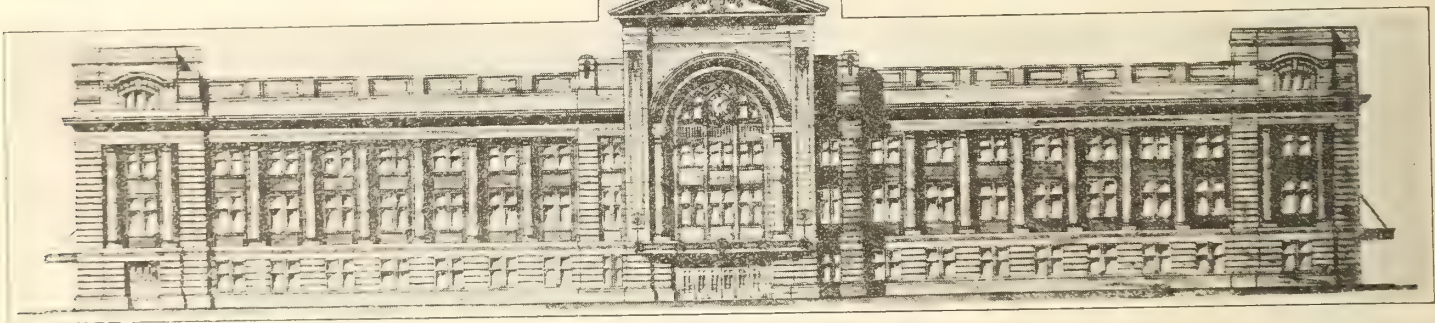
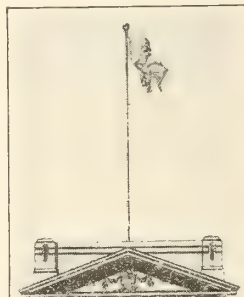
Canadian Northern Railway Station for Vancouver.

The Vancouver City Council has granted a permit to the C.N.R. for the erection of its station buildings. The estimated cost of the work proposed to be done under the permit is given as \$574,929. When the contract price for the station building was first mentioned the city council made a protest, calling attention to the fact that the agreement called for the expenditure of \$1,000,000 on the building. A letter was subsequently received from M. H. MacLeod, General Manager and Chief Engineer, stating that the difference covered the cost of train sheds, platforms, and station equipment which were not included in the contract, as well as architects' fees and other costs.

The accompanying illustration shows the street front of the new building. It will be of fireproof construction throughout, and has been designed along dignified classic lines, with a strong arched feature and supporting features at the extreme corners. The total frontage will be 321 ft. with a depth of 105 ft. It will contain a basement and 3 stories above street grade. Twelve Corinthian columns will stand at intervals across the entire front. The centre portion of the proposed structure will reach to a height of 100 ft. from the ground, the

constable, and a telephone booth. Passing through the vestibule door, the main lobby will be reached, this will be 41 ft. 9 in. x 27 ft. 9 in., to the right being the elevator hall, and stairway leading to the upper stories. The lobby will open on to the general waiting room, 148 ft. 9 in. x 48 ft. 8 in. deep. Right opposite the entrance lobby will be another lobby, 41 ft. 9 in. x 20 ft. 11 in., leading to a covered concourse 50 ft. wide, running along the entire length of the rear of building. From this concourse access to the various train platforms will be had. These platforms will also be covered. In all there will be 16 tracks leading into the station and the average of the platforms will be about 1,200 ft.

Opening off the general waiting room,



Vancouver Station, Canadian Northern Railway.

tower proper being 96 ft. high. The ends of the building will stand 64 ft. high, and the portions between the centre and the ends, 60 ft. high. These sections will be 3 stories high, and the ends and the centre portion 4 stories high.

Externally the front and both side walls will be constructed of granite up to base, and above, in stone, both of which materials will be procured locally. The general waiting room will be finished in marble about 6 ft. up, above which Caen stone will be used to ceiling, the latter to be panelled in ornamental plaster. The floors will be finished in terazzo. Marble will also be used in all corridors and lavatories, with terazzo floors. It is the intention as far as practicable to use British Columbia materials in the construction.

The building will be amply supplied at all points with natural light and ventilation, the form of the building on the upper floors permitting of direct light and air to all rooms and corridors. The large waiting room, which will have a lofty ceiling, will be lit not only from the top but also by means of clerestory lights on three sides, which will also afford splendid natural ventilation.

The part of the building set apart for public service will be the ground floor, the main entrance to which will be up a flight of steps in the centre of the block, leading into a vestibule 28 ft. 9 in. x 12 ft. 2 in. On the right of the vestibule will be located a room for the station

to the right will be arranged in the following order:—Train enquiry office, Y. W. C. A. travellers' aid office, barber shop; men's waiting room with lavatory, 54 ft. x 27 ft. 9 in. The women's waiting room, retiring room and lavatory will be on the opposite side, and will occupy a total space of 64 x 29 ft. Adjoining this will be the lunch counters and dining room, 70 x 29 ft., with serving room about half the size to the rear. Adjoining this will be the baggage room, transfer and customs office, 70 x 30 ft., the public counter being in the general waiting room, with receiving and dispatching sections, to the street and train platforms. At the platform ends of the general waiting room, to the right of the lobby will be the company's mail room, parcel checking room, drug store, and news stand. Inside the lobby will be a room for first aid purposes. The ticket office will be to the left of the lobby, and will be provided with four wickets. The entire end of the building to the right of the men's waiting room and the general waiting room will be devoted to the sleeping and dining car supplies department, the entrance to which will be from the platform; and to the company's express department. The section to the street front of the building, 40 x 29 ft. 8 in., will be used for general office purposes, and the remaining section, 52 x 72 ft., will be devoted to express traffic, with a portion of the area set apart for Government mail room. The two upper

floors will accommodate the company's general offices in Vancouver. There will be elevator service to all floors.

The general scheme also calls for the construction at once of freight offices, with freight shed, and the usual trackage and teamway facilities for the rapid handling of this branch of the business.

The cost of the passenger station, with its concourse and platforms, will be about \$1,000,000. The architects are Pratt & Ross, of Winnipeg and Vancouver. The contract for the building has been let to Carter, Halls, Aldinger & Co., and the Northern Construction Co., Winnipeg, who tendered jointly.

Litigation Over Aid to Pacific Great Eastern Railway.

The action brought by H. C. Brewster, leader of the Liberal party in the British Columbia Legislature, against Premier Bowser, representing the Government, in connection with the Pacific Great Eastern Ry. financing, was ordered by the court on Aug. 3 to stand over for hearing when the courts resume sitting after the long vacation. S. S. Taylor, K.C., counsel for Mr. Brewster, is reported to have said in an interview that the action is strictly in accordance with the present legal practice—the former practice required the presentation of a petition of right, or

the securing of a fiat. The action is to secure a declaration that certain acts done by Mr. Bowser as Attorney General were illegal. Mr. Taylor continued: "The case falls under four main headings. The first and principal of these is the payment by the government of \$18,000,000 to the contractors contrary to statute. These payments, according to law, should only have been made as the work progressed and the full amount should not have been paid out until the line was completed. We seek a declaration to this effect. The second part upon which we base our case is the payment of \$300,000 by the government as interest on the guaranteed bonds. This, we contend, should not have been done, and the government had no right to do it under the law until the railway was finished. We ask a declaration on this point also. The third part of our case deals with the issue of \$25,000,000 worth of stock to Foley, Welch & Stewart, which we claim should be restored to the P. G. E. Ry. And the fourth asks for a declaration that the new loan to the P. G. E. Ry. passed by the last legislature is illegal, it having been passed after the expiration of the legal session of the House."

It appeared from the proceedings before the judge, Aug. 3, that the Attorney General had not filed any defence, and did not propose to do so. The judge held that the case should be tried thoroughly as it involves important questions.

Canadian Pacific Railway Earnings for Year Ended June 30, 1916.

After a C.P.R. directors' meeting in Montreal, Aug. 14, a preliminary statement of earnings and expenses for the year ended June 30 was given out. Following are the figures, with a comparison for the three previous years:

Fixed charges are slightly lower; the usual \$125,000 is set aside for pension fund; the amount transferred from general railway account to special income account as net earnings of coastal steamers, commercial telegraph and news de-

	1915-16.	1914-15.	1913-14.	1912-13.
Gross earnings	\$129,481,885	\$98,865,210	\$129,814,824	\$139,395,699
Working expenses	80,255,965	65,290,582	87,388,896	93,149,825
Net earnings	\$49,225,920	\$33,574,628	\$42,425,928	\$46,245,874
From steamship dept.				1,245,563
Total net earnings	\$49,225,920	\$33,574,628	\$42,425,928	\$47,491,437
Fixed charges	10,306,196	10,446,510	10,227,311	10,876,352
Surplus	\$38,919,724	\$23,128,118	\$32,198,617	\$36,615,085
Steamship replace				1,000,000
Balance	\$38,919,724	\$23,128,118	\$32,198,617	\$35,615,085
Pension fund	125,000	125,000	125,000	125,000
Balance	\$38,794,724	\$23,003,118	\$32,073,617	\$35,490,085
To special income	1,923,289	1,494,152	2,115,842	
Available for dividends	\$36,871,435	\$21,508,966	\$29,957,774	\$35,490,085
Dividends for year	21,427,277	21,419,051	20,259,521	17,179,828
Net surplus for year	\$15,444,158	\$89,915	\$9,698,254	\$18,310,257
SPECIAL INCOME ACCOUNT.				
Special income	\$9,940,955	\$10,969,392	\$8,587,870	\$6,598,151
Dividends	7,800,000	7,800,000	7,350,000	5,850,000
Surplus	\$2,140,955	\$3,169,332	\$1,237,870	\$748,151
Previous surplus	6,266,144	3,096,812	1,858,941	1,110,790
Total surplus special income	\$8,407,099	\$6,266,144	\$3,096,812	\$1,858,941

*After making allowance for contingent reserves.

The chief feature of interest in the statement was the special income account, in view of the fact that the principal features of the regular railway earnings had been previously announced. The special income consists of interest on the proceeds of land sales, interest on deposits and loans, earnings from ocean steamships and hotels, net earnings of Pacific Coast steamships, commercial telegraph, and news department, interest on railway and other bonds and dividends on railway and other stocks held by the company, revenue from interest in coal mine properties, etc. The amount announced as being derived from this source for year ended June 30, \$9,940,955, was smaller than early estimates, but it is stated that it is arrived at "after making allowances for contingent reserves." The presumption is that the estimates of a larger amount for this fund out of the year's operations may not have been far wrong, but that the management has made some special appropriations from the total for purposes which may be more fully explained in the annual report or at the annual meeting. While the special income is over \$1,000,000 under the figures of the preceding year, it is larger than any other previous year. It is considered certain, however, that this department of the company's income is one that will grow.

The general statement of railway earnings shows that the net this year of \$49,225,920 creates a new record, although the gross is nearly \$10,000,000 under the record created in 1912-13. Working expenses in 1915-16 were nearly \$13,000,000 below the 1912-13 record.

The railway surplus of \$15,444,156 against the narrow one of \$89,915 in the preceding year, together with the special income surplus of \$2,140,955 create a total of \$17,585,113. This shows that the company earned from all sources 6.76% over and above the 10% distributed during the year to the shareholders from the combined accounts.

partment is \$1,923,289, or nearly \$500,000 more than a year ago.

After allowing for the preference dividend, which would take \$3,227,277, the balance remaining for the common stock is \$33,644,158, equal to 12.93% earned, against the 7% paid in dividends under railway account. The special income account, out of which the additional 3% common stock dividend is paid, yielded \$9,940,955, or 3.83% earned. After payment of the 7% dividend out of one account and the 3% out of the other, there was a net surplus of \$15,444,158 in the one case and of \$2,140,955 in the other, or a total net surplus for the year of \$17,585,113, against a corresponding surplus of only \$3,186,727 the previous year.

The 239th Railway Construction Battalion, Canadian Expeditionary Force, which is being recruited under Lt. Col. J. W. Stewart, Vancouver, B.C., has opened recruiting offices in Toronto and London, Ont. The battalion is being organized to do railway construction work only at the front; and only men experienced in railway construction are being enlisted. About 500 have already enlisted and are now training at Valcartier Camp, Que. The battalion will, it is said, go direct to the front as soon as it is recruited to strength.

Royal Commission on Canadian Railway Situation. We are officially advised that the work of investigation by the commission has already commenced and is well under way, and that as soon as outside work has advanced sufficiently and office work becomes necessary an office will be opened in Ottawa and a secretary will be appointed.

The Canadian Northern Quebec Ry. applied to the Quebec Courts recently for a writ directing the Montreal Stockyards Co. to accept at its stockyards the care of cattle brought into the city over the company's line. The order asked for was made by Judge Mercier, Aug. 15.

Railway Finance Meetings, Etc.

Algoma Central & Hudson Bay Ry.—A meeting of shareholders will be held at Sault Ste. Marie, Ont., Sept. 20, to elect directors, receive the report of the directors for the year ended June 30, and ratify the acts of the board done since the last meeting of shareholders. The shareholders of the Ontario, Hudson Bay and Western Ry., and of the Algoma Eastern Ry. will also meet on the same day for the same purposes. T. J. Kennedy is President and Alex. Taylor, Secretary of each of the companies.

Canadian Northern Ry.—A lease of rolling stock from the Imperial Rolling Stock Co. to the Canadian Northern Ry., dated Aug. 1, has been deposited with the Secretary of State at Ottawa.

Grand Trunk Pacific Ry.—There has been deposited with the Secretary of State at Ottawa a mortgage dated June 28, made between the company and the Minister of Finance, representing the King, to secure a loan not exceeding \$8,000,000. The granting of this loan was authorized at the Dominion Parliament last session.

Inverness Ry. and Coal Co.—An unconfirmed press report from Nova Scotia states that negotiations are in progress between the Railways Department and the company, which is controlled by Mackenzie, Mann interests, for the sale of the company's railway line to be used as a branch of the Intercolonial Ry. The railway extends from Inverness Jct., 1.5 miles from Point Tupper, to Inverness, N.S., 60.9 miles.

Quebec & Saguenay Ry.—A press report states that the proposal, authorized last session of the Dominion Parliament, for the purchasing of this line was ratified by the Government Aug. 4.

Temiscouata Ry.—The net earnings for May were \$4,105, and for 11 months ended May 31, \$32,248.

Toronto, Hamilton & Buffalo Ry.—There has been deposited with the Secretary of State at Ottawa duplicate original of consolidated mortgage dated Aug. 1, between the T. H. & B. Ry., and the Guaranty Fund Co. of New York, as trustee, securing the company's bonds to an amount not exceeding \$10,000,000.

White Pass & Yukon Ry.—In pursuance of an agreement adopted at a meeting of holders of the 5% consolidated first mortgage debenture stock, and 6% debentures, held in London, Eng., Feb. 16, the interest payable on these securities for the year ended June 30, is being paid by the issue of income debenture stock.

White Pass and Yukon Route. Gross earnings from Jan. 1 to July 14, \$719,353 against \$581,307, for same period 1915.

Railway Lands Patented. Letters patent were issued during July, in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta, and British Columbia, as follows:—

	Area.
Calgary & Edmonton Ry.	656.18
Canadian Northern Ry.	2,200.00
Canadian Pacific Ry.	1.00
Grand Trunk Pacific Ry.	81
Grand Trunk Pacific Branch Lines Co.	33.65
Qu'Appelle, Long Lake & Saskatchewan Rd. & Steamboat Co.	1,280.00
Total	4,729.57

C.P.R. Experimenting with Pulverized Coal.—A press report states that the C.P.R. is conducting experiments with the view of using Crow's Nest Pass coal in a pulverized state in its locomotives.

Canadian Pacific Railway Union Station at Quebec.

The recently completed union station at Quebec, was formally opened to the public, Aug. 10, the ceremony being performed by the Mayor. After the customary proceedings, a luncheon was provided in the waiting room for about 150 invited guests, among whom were F. L. Wanklyn, General Executive Assistant, C.P.R.; A. D. MacTier, General Manager, Eastern Lines, C.P.R.; Sir Lomer Gouin, Premier of Quebec; Hon. J. D. Reid, acting Minister of Railways and Canals; Hon. T. C. Casgrain, Postmaster General, and a number of others interested in transportation generally.

The building is L shaped, the main block being 142 by 65 ft., and the baggage and express wing is 130 x 44 ft. The main entrance vestibule is 24 ft. wide, and opens into the ticket lobby, 65 by 45 ft., and 60 ft. high. This is composed of grey tapestry brick with

the lock of a 10c piece.

The handling of baggage and express is provided for in a separate wing with covered trucking platform on each side. The upper floor of the main building is reached by a stairway from the main entrance vestibule, and is devoted to the company's offices, and a museum in which are exhibited an interesting and instructive collection of Canada's natural resources. The offices and museum overlook the main ticket lobby through open arches and balustrades. On this floor are also located rooms for the train men, which are reached by a separate stairway direct from the midway.

Accommodation is provided for the Canadian Government Railways, trains of the National Transcontinental Ry. running into and out of the station.

The building rests on 430 concrete piles, and 400 tons of structural steel were used in the construction, as well as 2,000 yards of reinforced concrete, 400,000 common brick, 75,000 face brick, exterior, and 125,000 face brick, interior,

Railway Rolling Stock Notes.

The Northern Ry. of Spain has ordered 15 locomotives from the American Locomotive Co.

The Eastern Car Co. has completed delivery of 1,000 gondola cars for the French State Railways.

The Duluth, South Shore and Atlantic Ry. is obtaining prices on one Pacific and 2 consolidation locomotives, 2 first class cars, 2 second class cars, and 2 baggage cars.

The Eastern Car Co. has shipped 325 freight cars, being the last of an order for 1,000 for the French State Railways. A description of them was given in a previous issue.

The Canadian Northern Ry., during July and August, received 2 compartment cars, nos. 9950 and 9951, and 3 tourist cars, nos. 9407, 9410 and 9412, from Canadian Car and Foundry Co.

The Russian Government has ordered 9 mogul locomotives from the American



Canadian Pacific Railway Union Station, Quebec.

marble base, faience cornices, cartouches and balustrades, with sloping mosaic ceiling and leaded glass ceiling lights. On the right of the ticket lobby are the ticket offices, information office, women's rest room and news stand, and on the left are the baggage and parcel checking counters, customs office, telephone booths and telegraph counter, and the transfer company's office opens out of the entrance vestibule. The concourse, entrance to which is gained through seven doors opposite the main entrance, is 125 by 62 ft. and 40 ft. high, similarly finished to the lobby. On the left, three sets of gates open to the midway and track platforms, and on each side of each gateway there is a mechanical indicator which shows the track number, time, and destination of the outgoing trains. On the right hand side of the concourse there is an exit to the street. The men's smoking room, lavatories, etc., are located in the north end of the concourse. The lavatory accommodation includes dressing rooms and toilets equipped with coin locks operated by the insertion in

and 10,000 cub. ft. of exterior cut stone. In every case possible Canadian materials were used. The building was designed by M. H. E. Prindel, Architect, Montreal, and the construction was supervised by D. H. Mapes, Engineer of Building Construction, C.P.R., under the direction of J. M. R. Fairbairn, Assistant Chief Engineer, C.P.R., and by T. E. Vidette, for the contractors, the Downing-Cook Co., Montreal.

Grand Trunk Western Ry. Rates.—The Interstate Commerce Commission has decided in the case of Michigan Seating Co. vs. G. T. Western Ry. that rating of fibre furniture in less than carloads as provided in official classification prior to April 15, 1914, is found upon rehearing not to be unreasonable, unjustly discriminatory, or unduly prejudicial when applied to shipments of fibre furniture in less than carloads from Jackson, Mich., to points in other states where rates are governed by official classification. Previous findings are vacated and complaint dismissed.

Locomotive Co. They will have 11 x 16 in. cylinders, 33½ in. driving wheels and a total weight in working order, of 37,000 lbs.

The Canadian Car and Foundry Co. has delivered 100 bogie wagons for the Nigerian Ry., West Africa; 125 all steel dump cars, for Hart-Otis Car Co.; 25 two compartment tank cars, and 20 three compartment tank cars, for Imperial Oil Co.

It is reported that the Imperial Munitions Board is placing orders on behalf of the Russian Government, for freight cars, and that an order for 7,000 has been divided between the National Steel Car Co., and the Canadian Car and Foundry Co.

A press report from New York states that an announcement has been made there by bankers recently returned from Russia, that a new Russian loan will be issued, and that contracts will be placed by Russia for 40,000 to 50,000 freight cars and 500 to 1,000 locomotives.

Canadian Government Railways, between June 15 and Aug. 12, received the

following additions to rolling stock: 2 steel sleeping cars from the National Steel Car Co.; 97 stock cars from Canadian Car and Foundry Co.; 25 vans from C. G. R. shops at Moncton, N.B., and 11 consolidation locomotives from Canadian Locomotive Co.

Canadian Northern Railway Construction, Betterments, Etc

Canadian Northern Ontario Ry.—A plan, profile and book of reference of the C. N. O. R. location through the township of McGregor, Thunder Bay District, mileage 548.45 to 568.13 has been filed in the Registry office at Port Arthur, Ont., The Board of Railway Commissioners has approved of this location.

Canadian Northern Ry.—A press report states that the company's officials are considering plans for the electrification of the line to Victoria Beach, Man. The suggestion is to make connection with the main line at Elmwood or Kildonan, and run to and from Winnipeg by Elmwood bridge. The present route to Victoria Beach is via Transcona, the total distance being 75 miles. The report states that work is to be started in the spring of 1917, and will necessitate the relaying of the track with 85 lb. rails.

Work is in progress on the alterations of St. Marys Hall, corner of Eighteenth Ave. and First St. Calgary, Alta., necessary to make it suitable for station purposes. An addition 70 ft. long is being built on the south side for freight and express purposes. The line which now terminates on the south side of the Elbow River is to be carried across the river to the hall by the time the alterations are completed. The work of remodelling the hall is estimated to cost \$10,000, and is expected to be completed early in October. M. H. MacLeod, General Manager and Chief Engineer, is reported to have advised residents of Red Deer, Alta., that the Red Deer River bridge will be completed at once so as to permit the extension of the Brazeau line into the place this year. The grading has been completed, and it was reported Aug. 4, that men were putting in the culverts along the eight miles of grade. A large quantity of timber for the bridge is also reported to have been delivered on the site.

Work is reported to have been started on the building of a new machine shop and store building in the yards at Edmonton, Alta. The machine shop will be a one story building, 61 x 118 ft., and is estimated to cost \$20,000, while the store building will be two stories high, 80 x 48 ft., and is estimated to cost \$5,700. The foundations for both buildings will be of concrete, and the superstructures of brick.

A press report states that the early extension of the line at present terminating at Sangudo—known as the Peace River Branch—to White Court, 40 miles, is being contemplated.

Canadian Northern Pacific Ry.—A press report states that a contract has been let for the building of the projected branch line from Kamloops to Kelowna, B.C.

M. H. MacLeod, General Manager and Chief Engineer, had an interview with the New Westminster City Council Aug. 7, respecting the right of way in the city to the proposed terminal west of the C.P.R. station.

M. H. MacLeod, General Manager and Chief Engineer, met the Vancouver City Council Aug. 2 to discuss matters connected with the station building, on

which work is now in progress, and as to the location of a hotel which is to be built on a site other than False Creek. A proposition as to a site on Main St., owned by the city, is to be submitted at an early meeting of the civic bridges and

railways committee. While the company, Mr. MacLeod said, was ready to carry out its agreement to put up a 250 room hotel away from False Creek, it would rather put up a larger hotel on its own property at False Creek.

Canadian Pacific Ry. Construction, Betterments, Etc.

Montreal Terminals.—The Board of Railway Commissioners has amended the plans for the proposed tunnel under the C.P.R. tracks at Melrose Ave., Notre Dame de Grace, so that it will be 6 ft. wide and 8 ft. high instead of 4 ft. wide and 7 ft. high. The estimated cost of the work under the amended plan is \$5,200.

Saskatchewan Division.—Rapid progress is reported to have been made to

the approach work is being completed, and everything is being got ready for the regular operation of trains through it.

A Vancouver press report states that a contract has been let to W. D. Grant for the carrying out of a comprehensive dredging scheme at the waterfront there, between sheds 3 and 7. This area includes the berth in front of the station shed, and the berths immediately east of that part now used by the Pacific



North Toronto Station, Canadian Pacific Railway.

The illustration published in Canadian Railway and Marine World for July, in connection with the article on the opening of North Toronto station, was made, as stated, from the architect's drawing, and did not show the butterfly roofs over the platforms. The above illustration, made from a photograph, shows the station as completed, together with the butterfly roofs. Under the Yonge St. subway, to the left of the illustration, are shown the tracks which are being built to extend the Toronto Railway from its present terminus on Yonge St., just south of the C.P.R. crossing, to the city's old north limits, between Woodlawn and Farnham Avenues, where the Toronto & York Radial Ry. Metropolitan Division's present southerly terminus is. There will, however, be no physical connection, as the city of Toronto would not consent to it and also because the two electric railways have different gauges.

date with the construction of the seven-mile extension from Vantage to Assiniboine. A press report says the line will be ready for operation by Nov. 1.

British Columbia Division.—The company is reported to be utilizing the rock spread over the valley by the slide of Turtle Mountain at Frank, B.C. some years ago, to fill in washouts, and to reduce the gradient on the new line which was built over the slide, and so do away with the necessity of using a further locomotive to take trains over.

A press report from Montreal, Aug. 10, stated that the Duke of Connaught had, at the request of Baron Shaughnessy, authorized the company to name the double track tunnel at Rogers Pass, B.C., which he formally opened July 17 and named the Selkirk, to be called the Connaught tunnel. The permanent tracks are being laid through the tunnel,

Coast Steamship Co.'s steamers. The area will, it is said, be dredged so as to give a depth of 33 ft. and the estimated cost of the work is given as \$200,000. It is reported that this work is being undertaken in preparation for the erection of additional docks to which reference was made in our July issue, pg. 285. D. C. Coleman, Assistant General Manager, Western Lines, was reported to have said on Aug. 5 that work would be started almost immediately on building of another pier for trans-Pacific traffic. The pier it is said will be a double decked one, about 850 ft. long, extending out to the harbor line, and is estimated to cost \$1,500,000. Up to Aug. 14, no definite official announcement had been made, but it was expected some statement would be made by F. W. Peters, General Superintendent British Columbia Division, on his return from the east. (Aug., pg. 330.)

Mainly About Railway People Throughout Canada.

J. Murray Gibbon, General Publicity Agent, C.P.R., Montreal, was visiting in England during August.

W. R. Boucher, Train Master, C.P.R., Assiniboia, Sask., has been undergoing treatment in a Montreal hospital.

J. E. Dalrymple, Vice President, G.T.R. and Grand Trunk Pacific Ry., completed a tour of the G. T. P. R. system recently.

Edward Canfield, General Superintendent, New York, Ontario & Western Rd., died at his home at Middleton, N.Y., Aug. 18.

Mrs. J. A. MacGregor, wife of the Superintendent, C.P.R., Edmonton, Alta., is in British Columbia convalescing after illness.

W. P. Clough, Chairman of the Board of Directors, Northern Pacific Rd., died at his home in New York, N.Y., Aug. 18, aged 71.

Sir James A. M. Aikins, who has been appointed Lieutenant-Governor of Manitoba, was formerly solicitor for the C.P. R. in Winnipeg.

P. D. LeBlanc, car inspector, Intercolonial Ry., Moncton, N.B., died there, July 31, aged 65. Three of his sons are in I.R.C. service.

G. H. Duggan, M.Can.Soc.C.E., Vice President and General Manager, Dominion Bridge Co., has been elected a director of the Royal Bank of Canada.

H. M. Bird, who was for a time acting Trainmaster National Transcontinental Ry., Graham, Ont., has resigned on his enlistment for active military service overseas.

Clarke Gordon, of Sherbrooke, Que., who died at North Hatley, July 31, aged 80, was, some years ago, a railway contractor, and built a section of the Intercolonial Ry.

R. B. Angus, director, C.P.R., Montreal, and Sir Thomas Tait, President, Fredericton and Grand Lake Ry. and Coal Co., have been elected Fellows of the Royal Colonial Institute.

C. P. VanNorman, Resident Engineer, Toronto and York Radial Ry., Toronto, is attached to the 127th Battalion (York Rangers), with the rank of lieutenant, and is stationed at Camp Borden.

Sir William D. Reid, President, Reid Newfoundland Co., St. John's, Nfld., is head of a company which is being organized for the establishment of a patent fertilizer plant in Newfoundland.

Lieut. J. K. Kennedy, who is reported as seriously wounded in Flanders, is the only surviving son of Sir John Kennedy, Hon. M. Can.Soc.C.E., Consulting Engineer, Montreal Harbor Commission.

Lt. Col. H. N. Ruttan, M.Can.Soc.C.E., Consulting Engineer for the City of Winnipeg, and formerly City Engineer, who has been for some time District Officer Commanding at Winnipeg, has been promoted to Brigadier General.

Sir George Paish, who was named recently as one of the commission appointed by the Dominion Government to enquire into the general railway situation, is stated to have declined the appointment on account of ill health.

A. A. Bourgeois, J.P., who died at Moncton, N.B., Aug. 6, was father of B. A. Bourgeois, Assistant to the Comptroller and Treasurer, and C. J. Bourgeois, chief clerk, Insurance Department, Canadian Government Railways, Moncton, N.B.

William Phillips, until recently European Traffic Manager, Canadian Northern Ry., London, England, returned to Toronto, Aug. 23, and is taking a holiday, after which he will be appointed to an important position in the Traffic Department.

T. J. Drummond, who died at Castine, Me., Aug. 5, was a partner in Drummond, McCall & Co., Montreal, formerly selling agents for the Algoma Steel Corporation, and was intimately known by many railway men. The funeral took place at Montreal, Aug. 8.

W. N. Ingram, whose appointment as acting Master Mechanic, District 5, National Transcontinental Ry., Edmundston, N.B., as announced in our last issue, was since Jan. 1, travelling locomotive man, and prior to that was a locomotive man. His present position is a new one.

Lieut. H. A. Lumsden, Canadian Overseas Railway Construction Corps, B.E.F., eldest son of H. D. Lumsden, M.Can.Soc. C.E., ex-Chief Engineer, National Transcontinental Ry., will be married in England in September, to Miss G. M. Dunsstan, of Brantford.

Michael Heenan, detective for Michigan Central Rd., with headquarters at St. Thomas, Ont., will be superannuated on Oct. 1. He joined the Royal Irish Constabulary in 1866, became a G.T.R. detective at Stratford in 1872 and went to St. Thomas in 1881.

Sir William Mackenzie, President, Canadian Northern Ry., Miss Ethel Mackenzie, Mrs. Scott Griffin, D. B. Hanna, Third Vice President C.N.R., Mrs. and Miss Hanna, left Toronto Aug. 24 and sailed by the s.s. St. Paul from New York for England on Aug. 26, expecting to be away about five weeks.

Lloyd E. Omer, who has been appointed Travelling-Freight and Passenger Agent, Union Pacific System, Calgary, Alta., was formerly Travelling Freight Agent at Spokane, Wash., and prior to that was assistant rate clerk in the Passenger Department at Portland, Ore.

F. E. Dewey, who was appointed General Manager, Wellsville and Buffalo Rd. Corporation, Buffalo, N.Y., recently, on that company assuming separate operation of the road, has, at his own request, been relieved of the position, the duties being assumed by the Vice President.

J. E. Dalrymple, Vice President, Grand Trunk Pacific Ry., arrived in Victoria, B.C., Aug. 12, in the course of his annual tour of the railway and the points reached by its steamships. After visiting Seattle, Wash., Mr. Dalrymple and party sailed for Prince Rupert, and returned east via the G. T. P. R.

H. L. Petrie, who has been promoted from Staff Sergeant to temporary Lieutenant, Army Service Corps, Canadian Expeditionary Force, after being in France and Flanders for 18 months, is son of J. J. Petrie, Traffic Manager, Midland and Great Northern joint railways, King's Lynn, Norfolk, Eng.

W. D. Robb, Superintendent of Motive Power, G.T.R., returned to Montreal, early in August, from England, where he had been visiting his son, J. B. Robb, who was wounded in action. During his stay in London, he was, with F. C. Salter, European Traffic Manager, G.T.R., entertained at the Mansion House, by the Lord Mayor.

R. Home Smith, of Toronto, has been elected President, Mexico North Western

Ry., with offices at Toronto, and at El Paso, Tex., vice F. S. Pearson, deceased. Its main line runs from El Paso, Texas, to Chihuahua, Mexico, 472 miles, and it also has a 14 mile branch. Walter Gow, barrister, Toronto, is one of the vice presidents.

Hon. Frank Cochrane, Minister of Railways, who is spending some time at St. Andrews, N.B., spent Aug. 18 in making an inspection of the work in progress on the new ocean terminals at Halifax, N.S., previous to which he made an inspection of the Prince Edward Island car ferry terminal work in progress at Cape Tormentine, N.B.

James Farrar Speakman, who has been appointed City Ticket Agent, C.P.R., Winnipeg, was born at Dundee Scotland, Aug. 28, 1878, and entered C.P.R. service, May 1, 1908, since when he has been, to Jan. 1909, report clerk, Winnipeg station; Jan. 1909 to March 1910, ticket clerk, same place, and March 1910 to July 1916, chief clerk, District Passenger Agent's office, Winnipeg.

Baron Shaughnessy, who was at his summer home, St. Andrews, N.B., during August, visited Halifax, Aug. 16, to meet relatives returning from Europe. These were Capt. and Hon. Mrs. Rene Redmond and Mrs. A. F. Shaughnessy and her children. Capt. Redmond is on short leave from the front, and Mrs. Shaughnessy is the widow of the late Capt. Hon. A. F. Shaughnessy, killed in action recently.

John A. McGill, whose appointment as City Passenger Agent, C.P.R., Ottawa, Ont., was announced in our last issue, was born at Acton, Ont., Dec. 23, 1880, and entered railway service in Oct. 1896, since when he has been, to Oct. 1897, assistant agent, G.T.R., at Guelph and Acton, Ont.; Feb. 1900 to April 1913, not in railway service; April 1913 to Sept. 1915 to Jan. 1916, City Passenger Agent, C.P.R., Cleveland, Ohio; Jan. to July 1916, Travelling Passenger Agent, C.P.R. Chicago, Ill.

J. A. Metivier, who has been appointed City Passenger Agent, C.P.R., Sherbrooke, Que., entered Great North Western Telegraph Co.'s service as messenger boy, in 1906. From 1907 to 1909, he was operator and assistant agent, G.T.R.; 1909 to 1910, operator Great North Western Telegraph Co.; Jan. 3, 1910 to 1911, commercial operator, C.P.R., Calgary, Alta.; 1911, commercial operator, C.P.R., Montreal; 1911 to May 30, 1916, commercial operator and assistant ticket agent, C.P.R., Sherbrooke, Que.

Argee J. Roy, who has been appointed City Ticket Agent, Canadian Government Railways, Montreal, was born at St. Anaclet, Rimouski County, Que., June 5, 1874, and entered Canadian Government Railways service in April 1897, since when he has been, to Oct. 1898, telegraph operator, St. Fabien, Que.; Oct. 1898 to March 1905, ticket clerk, Levis station, Que.; March 1905 to April 1912, ticket agent, Riviere du Loup, Que.; April 1912 to Oct. 1913, train agent on passenger trains, Levis, Que.; Oct. 1913 to July 1, 1916, ticket agent, Levis, Que.

Aage Oscar Wolff, whose appointment as Resident Engineer, District 2, Lake Superior Division, C.P.R., Chapleau, Ont., was announced in our last issue, was born at Copenhagen, Denmark, May 14, 1887, and entered railway service Oct. 1, 1908, since when he has been, to Mar.

15, 1909, rodman, C.P.R., Montreal; Mar. 15 to Sept. 1, 1909, draughtsman, C.P.R., Montreal; Sept. 1, 1909 to April 1, 1913, transitman, C.P.R., Montreal; April 1, 1913, to Oct. 15, 1915, to May 1, 1916, Assistant Engineer to Consulting Engineer, Public Service Corporation of New Jersey, Newark, N.J.

Joseph Madill, who has been appointed District Passenger Agent, Canadian Northern Ry., Edmonton, Alta., was born at Port Hope, Ont., May 23, 1890, and entered railway service May 23, 1890, since when he has been, to Aug. 1893, assistant agent, C.P.R., Fergus, Ont.; 1893 to 1894, operator at various points, Ontario Division, C.P.R.; 1894 to 1902, ticket clerk, C.P.R., Union Station and City Ticket Office, Toronto; 1902 to 1911, ticket agent, telegraph agent, C.P.R., and agent, Dominion Express Co., Windsor, Ont.; 1911 to Aug. 1916, City Passenger and Ticket Agent, Canadian Northern Ry., Edmonton, Alta.

Donald McDonald, District Passenger Agent, Canadian Government Railways, Montreal, died there, Aug. 18, after a three months illness due to heart affection. He was born at Ste. Hyacinthe, Que., Feb. 28, 1862, and entered railway service in 1880, since when he was, to 1882, night agent and operator, Intercolonial Ry., Ste. Anne, Que.; 1882 to 1885, operator, I.R.C., Ste. Flavie, Que.; 1885 to Jan. 1912, joint ticket agent, I.R.C. and G.T.R., Levis, Que.; Jan. 1912 to July 1913, Superintendent, Montreal and Ste. Flavie District, I.R.C., Levis, Que.; July 1913 to the date of his death, District Passenger Agent, Canadian Government Railways, Montreal.

G. W. Groom, whose appointment as Assistant Superintendent, Central Vermont Ry., St. Albans, Vt., was announced in a recent issue, was born at Rossville, Ill., Aug. 26, 1872, and entered railway been, to Nov. 1899, telegraph operator, Chicago and Eastern Illinois Rd., and New York, Chicago and St. Louis Rd.; Nov. 1899 to Dec. 1904, dispatcher, Pennsylvania Rd., Buffalo, N.Y.; Dec. 1904 to June 1908, dispatcher, G.T.R., Belleville and St. Thomas, Ont., and Pere Marquette Rd., Detroit, Mich.; June 1908, to July 1912, dispatcher, Central Vermont Ry., St. Albans, Vt.; July 1912 to May 1915, Chief Dispatcher, same road; May 1915 to June 22, 1916, Assistant to Superintendent, same road.

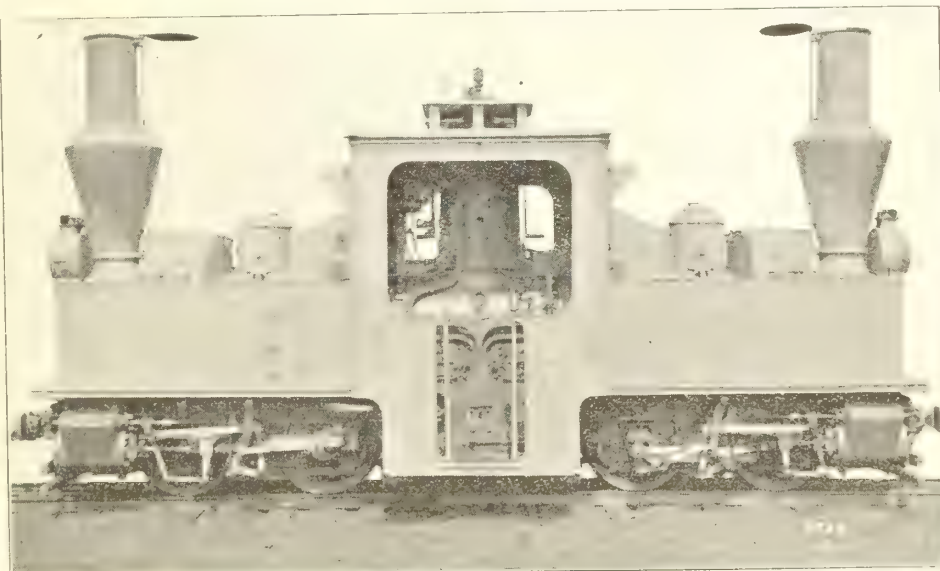
E. D. Toye, who has resigned as Division Storekeeper Canadian Northern Ry., Trenton, Ont., on his appointment as Quartermaster Sergeant, No. 1 Construction Battalion, was born at Dalston, Ont., Apr. 27, 1891, and entered railway service July 1909, since when he has been, to May 1910, storeman, Canadian Northern Ontario Ry., Parry Sound; May 1910 to Nov. 1911, assistant, Stores Department, same road, Toronto; Nov. 1911 to July 1914, chief clerk, same department, Toronto; July to Oct. 23, 1914, Storekeeper, same road, Toronto, at which latter date he was appointed Storekeeper, Ontario Grand Division, Canadian Northern Ry., Toronto, and later removed to Trenton.

E. G. Barrow, who died at Toronto recently, was born at Bristol, Eng., in 1846, and after graduating from Taunton College entered the service of the Bristol and Exeter Ry.; now Great Western Ry., as an articulated pupil under the Chief Engineer, and was later appointed Assistant Engineer at Bristol. He came to Canada in 1871 and was engineer on the Midland Ry. and the Hamilton and Northwestern Ry., now forming portions

of the G.T.R. In 1877 he commenced private practice and later engaged considerably in municipal engineering, and a few years ago was City Engineer of Hamilton, Ont. He was a member of the Canadian Society of Civil Engineers from 1893, and was also an Ontario land surveyor.

Double Bogie Locomotives for French Government.

The accompanying illustration shows a double-bogie locomotive of the Pechot type, of which the Baldwin Locomotive Works has built 180 for the French Government and now has 100 additional on order. They are built throughout to the metric system, from drawings and specifications furnished by the purchaser. They are generally similar in construction to the Fairlie type, being carried



Double Bogie Locomotive for French Government Railways.

on two 4-wheeled steam driven bogies, and having a boiler with 2 barrels and 2 centrally located fireboxes. The fireboxes are placed in a common outside shell, which is surmounted by a large steam dome. The throttle valves and levers are so arranged that steam can be used in the cylinders of both bogies, or in those of one bogie only, as desired. The live steam supply passes through the bogie centre pins. This plan permits a minimum number of flexible joints to be used in the live steam piping. All the cylinders are equipped with balanced slide valves, which are driven by Walschaerts motion. The 4 gears are simultaneously controlled by a hand lever. The illustration shows the fireman's side of the locomotive, and the location of the 2 fire doors. There is a coal bunker at each side of the cab, the water tanks being cut away, as shown by the sloping row of rivets, to provide the necessary room. The general dimensions, etc., are as follows:

Gauge	0 m 600
Cylinders (4)	0 m 175 x 0 m 240
Valves	Balanced side
Boiler	
Type	Wagon-top
Diameter	0 m 632
Thickness of sheets	0 m 009
Work press	12 kg. per cm ²
Fuel	Coal
Staying	Crown-bar
Fire Boxes (2)—	
Material	Copper
Length, each	0 m 415
Width	0 m 576
Depth, front	0 m 870
Depth, back	0 m 820

Thick, of sheets, sides	0 m 012
Thick, of sheets, back	0 m 012
Thick, of sheets, crown	0 m 012
Thick, of tube	0 m 020 and 0 m 012
Water space—	
Front	0 m 650
Sides	0 m 050
Middle	0 m 650
Tubes—	
Material	Brass
Thickness	0 m 002
Number	96
Diameter	0 m 045
Length	1 m 710
Heating surface—	
Fire Box	3 m ² 762
Tubes	23 m ² 225
Total	26 m ² 987
Grate area	0 m ² 474
Driving wheels—	
Diameter, outside	0 m 650
Diameter, centre	0 m 560
Journals, diam.	0 m 120
Journals, length	0 m 092
Wheel Base—	
Driving	3 m 800
Rigid	0 m 900
Total engine	3 m 800
Weight —	

On driving wheels	12790 kg.
Total engine	12790 kg.
Tank capacity	1,514 litres
Fuel capacity	400 kg.
Service	Freight

CANADIAN GOVERNMENT RAILWAYS.

Tenders.

Sealed Tenders, addressed to J. W. Pugsley, Secretary Department of Railways and Canals, Ottawa, Ont., and marked on the outside "Tender for Elevator Foundations, St. John," will be received up to and including Twelve O'clock Noon, Monday, September 18th, 1916, for the construction of foundation for a 1,000-ton capacity Grain Elevator, Working House and Truck Shed at St. John, N.B.

Plans, Specifications and blank form of Contract may be seen on and after Monday, August 28th, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa; at the office of the Chief Engineer, Moncton, N.B.; at the office of the Terminal Agent, St. John, N.B.; and at the office of the John S. Metcalf Company, Limited, Engineers, Montreal, P.Q.

All the conditions of the Specifications and Contract form must be complied with.

Tenders must be put in on the blank form of tender, which may be obtained from any of the offices at which plans and specifications are on file. Each tender must be accompanied by a certified bank cheque, payable to the Receiver General of the Railways and Canals, for the sum of \$10,000.00.

The lowest or any tender not necessarily accepted.

F. P. GUTELIUS,
General Manager.

Dated at Moncton, N.B.,
August 23rd, 1916.

Railway Development, Projected Lines, Surveys, Construction Betterments, Etc.

Cape Breton Ry.—An unconfirmed press report states that the Railway Department is negotiating with the R. W. Leonard Co., Boston, Mass., for the purchase of the Cape Breton Ry., extending from Point Tupper to St. Peters, N.S., 30 miles, to be used as a branch of the Intercolonial Ry. In the event of this line being acquired, the report adds, it will be extended round the coast as far as Sydney. The surveys for this extension are reported to be completed to East Bay, and it is said they will be finished early in September.

Dominion Atlantic Ry.—Tenders are under consideration for building a new passenger station and freight shed at Middleton, N.S. G. E. Graham, Kentville, N.S., General Manager. (Sept., 1915, pg. 314.)

Dominion Government Railway to Hudson Bay.—Chief Engineer Porter is reported to have stated, in an interview Aug. 7 at Pas, Man., that construction was being pushed ahead as fast as possible. It is expected that steel will be laid to the Kettle Rapids of the Nelson River, about 30 miles from Port Nelson, by the end of September. At the date of the interview track had been laid to mileage 278, leaving about 54 miles of practically completed grading on which to lay steel before reaching Kettle Rapids. The line is being ballasted as track laying is progressed with. The preliminary work for the erection of the steel bridge across the Nelson River at Kettle Rapids is well forward, and supplies are being taken forward so as to be in readiness as soon as track laying has reached the rapids. The contract for the erection of the piers has been let to the Hudson's Bay Construction Co., and R. A. Hazlewood is engineer in charge of the work. The bridge is expected to be completed next spring, so that the steel can be laid into Port Nelson during the summer of 1917.

According to the statement credited to the Chief Engineer tenders are to be called for during the winter for the construction of the southern terminals of the line at Pas. There are at least a dozen buildings to be erected, the largest being the station and executive offices. Plans for this building are not complete, though draughtsmen are working on them. In addition to this building there will be a locomotive house, with pits, machine shop, round house, freight sheds, ice house and other buildings. At the north front a 90 ft. turntable will be built, to be operated electrically. (July, pg. 281.)

Edmonton, Dunvegan & British Columbia Ry.—The Board of Railway Commissioners has authorized the opening for traffic, at a speed not to exceed 15 miles an hour, of the Grand Prairie branch from Spirit River to Grand Prairie, Alta., 50.19 miles. (Aug., p. 317.)

Grand Trunk Ry.—A press report states that work is to be started upon the new car shops at Port Huron, Mich., at an early date. The estimated cost of the new shops is \$750,000. Their erection has been under consideration since 1915, when Port Huron citizens raised \$100,000 for the purchase of certain properties necessary to the carrying out of the plan for providing the site for the shops, which adjoins the entrance to the tunnel. (Aug., pg. 317.)

Grand Trunk Pacific Ry.—Sir Collingwood Schreiber, who supervised the build-

ing of the G.T.P.R. on behalf of the Dominion Government, returned to Ottawa at the beginning of Aug., accompanied by Lady Shreiber, after making a trip of inspection over the line. In the course of an interview at Vancouver, he is reported to have said the line is ballasted with a full lift of ballast—1 ft. under the tracks—for over half its mileage, and to a depth of 6 in. for the rest of the mileage. Ballasting is still being proceeded with.

A Prince Albert, Sask., press report of Aug. 16 states that officers of the company met the Prince Albert City Council that day and arranged for the immediate starting of construction of the branch line from Young, which now is in operation to St. Louis, 88 miles, into the city. A press report a few days previously said that the company had given a promise to the Saskatchewan Government that this construction would be started at once. The bridge over the Saskatchewan River at the present terminus of the line was completed, and the tracks laid over it in 1915. This line is one of those being constructed under a guarantee of bonds by the province. (July, pg. 281.)

Great Northern Ry.—The Board of Railway Commissioners has authorized the Vancouver, Victoria & Eastern Ry. & Navigation Co. to make connection with the Kettle Valley Ry. and with the Canadian Northern Pacific Ry. at certain points, and to cross and divert certain streets and avenues in Hope, B.C. This work is necessary to connect up the company's lines in the vicinity of Vancouver with the section of the Kettle Valley Ry. from Coquihalla Summit to Hope, over which the V. V. & E. Ry. & N. Co. operates its trains by agreement. The British Columbia Department of Railways has also approved of plans for the connection of the V. V. & E. Ry. & N. Co.'s lines with those of the C. N. P. Ry. The Board of Railway Commissioners has also authorized the company to connect its line with the C. N. P. Ry. at Sumas Landing.

The Vancouver City Council has granted the company a permit for the erection of its station on the False Creek flats. The building is to be erected in close proximity to the Canadian Northern Pacific Ry. station. (Aug., pg. 317.)

Intercolonial Ry.—The new steel bridge over the Bartholomew River was completed Aug. 3, and work is now being gone on with on the concrete arch at Passiac, N.B.

The Sackville, N.B., locomotive house was destroyed by fire Aug. 15, together with a locomotive. (Aug., p. 317.)

See also Cape Breton Ry.

Kettle Valley Lines.—The Board of Railway Commissioners has authorized the opening for traffic of the line from Brodie, 13.2 miles east of Coquihalla Summit, B.C., to its connection with the C.P.R. main transcontinental line at Peltain, west of Hope Station, 52.9 miles. (Aug., pg. 317.)

National Transcontinental Ry.—Tenders are under consideration for the erection of the superstructure of a reinforced concrete elevator of 1,000,000 bush capacity at Transcona, Man. (Aug., pg. 317.)

Pacific Great Eastern Ry.—The company has settled its long standing difference with North Vancouver municipality respecting the location of the line there. The company secures a five-year lease of the Y at Chesterfield Ave., and

agrees to operate a car ferry service to connect North Vancouver with the C.P.R. terminals in Vancouver.

With respect to construction from the present end of track at Clinton to Prince George, it is reported that work on the big steel bridge near Clinton is being pushed ahead, and that men are being taken in for grading and track laying. There is, however, a great scarcity of men, and it is difficult to say just what work will be done. (Aug., pg. 317.)

Hon L. Campbell, representing the B.C. Government, accompanied by D'Arcy Tate, Vice President and General Counsel, and P. Welch, the general contractor, went over the line from Squamish to Clinton, Aug. 12, to arrange as to the prosecution of construction to Prince George.

Prince Edward Island Ry.—Tracklaying is reported to have been completed at the car ferry terminals at Cape Tormentine, N.B., and work is reported to have been started on laying track at the ferry terminals at Carleton Point, P.E.I. W. W. Brownell is reported to be in charge of the work. (June, pg. 222.)

Quebec Bridge.—It is expected that the central span of the bridge across the St. Lawrence River near Quebec will be placed in position between Sept. 14 and 16. This span which will connect the ends of the north and south cantilever arms is 640 ft. long, 88 ft. wide, and 110 ft. high at the centre, weighs about 8,000 tons. It will be towed into position on 6 pontoons on scows, each 160 ft. long and 32 ft. wide. When towed into position it will be attached to long hangers from the ends of the cantilever arms and jacked into place by means of heavy jacks. The operation, it is expected, will not take more than 24 hours. (Aug., pg. 217.)

Regal Collieries, Taber, Alta.—A contract is reported to have been let to H. Thacker for building a spur line from Taber to the Regal Collieries, the White Ash Mine and other collieries north of the town. (July, pg. 282.)

St. John and Quebec Ry.—There has been deposited with the Minister of Public Works at Ottawa plans and descriptions of the site of the proposed bridges on the extension of the line, now under construction, between Gagetown and Westfield, N.B.; the location of the bridges being as follows: Mileage 41.2, Otnabog Lake outlet, Hampstead, Queen's County; and mileage 64.49, Devil's Back Creek, Greenwich, King's County. (Aug., pg. 318.)

We are officially advised with reference to construction work on the extension from Georgetown to Westfield, N.B., 40 miles, that the general contract has been let to the Nova Scotia Construction Co. The route is along the westerly bank of the St. John River, passing through or near Central Hampstead, Hampstead to Upper Greenwich, thence along the banks of the Long Reach to a junction with the C.P.R. at Westfield. The point at which this route deviates from the original survey is near Upper Greenwich. The original route crosses the river near here at the Mistake, and a little further on crossed the Kennebecasis River and ran along the easterly bank of that stream into St. John. The change was made owing to the cost of the construction of the bridges and the desire to give accommodation as speedily as possible to the residents of the district through which the completed line from Centreville to Gage-

town, 130 miles, runs. The contract is for gradini bridging, track laying, etc., the company reserving the right to supply rails, spikes, etc. Directors of the company, who represent the New Brunswick Government, together with Dominion Government Engineer Taylor and the Company's officers made an inspection

trip over the route from Gagetown to Hampstead, Aug. 16, to see the work being done.

The extension of the line northerly from Centreville to Grand Falls, 50 miles, has been located. Nothing is settled as to when construction on this section will be undertaken.

The Selection and Education of Section Forces.

By J. W. McManama, Supervisor B. & M. Rd.

Section foremen are the most important noncommissioned officers in the maintenance of way organization of any railway. The proper upkeep of good track and right of way absolutely depends on their efforts. For their best interests and for the good of the road, they should be trained and selected men who are given the greatest help in the shape of tools, forces, and instruction, that their superiors can procure.

The type of man who is to be a section foreman is the first important consideration. On our road, we are very fortunate in having excellent men; and undoubtedly many other roads are equally fortunate. But it is usually pure luck or chance, because very few systematic methods are employed to get good men.

I don't expect a man whom I pick as section foreman to be a good foreman the day he assumes the job. I am usually careful to tell him so. But I do expect him to become a good one after the first year; and that means that some mistakes are possible on his part—and even probable—but the same one not more than twice. It has occurred to me that some plan could be devised to present the outline of the section foreman's work, responsibilities and rewards to such men as would be considered likely.

When a man becomes a section foreman after his apprenticeship on track, and in rare cases does not make good, I am tempted to blame his training, or rather lack of training, rather than the man himself, in nine cases out of ten. As I have said, I don't expect to have a good section foreman the minute a man becomes one. But it is certainly essential that he be educated and trained in the best possible fashion. And I would recommend, wherever it is possible, that this training be continuous and co-operative.

Staff meetings of executive officers are a big success on railways. The same idea is carried out in our safety first meetings and results are apparent there. A certain number of foreman could be called together once every two months and exchange views in regard to the work, also receive instructions and have them get familiar with one another in regard to handling work and explain to them how important it is to look closely after the work and material. State to them the cost of the material and show them the expense and layout of their sections so as to make them familiar with the cost of running their part of the road—showing them that each day there is a large layout for labor besides the material which is used.

You often see a large express train going over the road, representing quite a large amount of money. The engine-men feel that they are responsible for pulling this train over the line in safety. The section foreman should likewise feel that he is responsible to a certain extent for having his track in a safe and good condition so as to allow this traffic to pass over in safety. Therefore, I think

it is well to impress it on their minds by calling their attention to these facts thereby illustrating the position they hold and the responsibility which goes with it.

A thing which should be explained to each one, is the cost of all material, washers, spikes, bolts, nuts, joints, etc., each part to be specified so that they will know when they see the stuff scattered or lying around, how much can be wasted if left without being looked after properly. Take the labor. The expense of the section crew should be figured out and the foreman's attention called to it now and then, showing him the amount that is paid each day by the company to maintain his crew.

I feel that section foremen are sensitive in this matter and all they want is to be recognized for work; but if let go when their work is performed in good shape and no notice taken of it, it is apt to cause a lack of feeling. However, we should take notice of and encourage them if they are right and if wrong show them their error and they are willing at all times to try and do their best for the improvement of the road, as I know there is no class of men who try harder to keep their work up and look after the value of a dollar which is expended to see that it is put to good advantage to keep their track up, than the section foremen; and, I am sorry to say, in a great many cases they do not get the credit due them, thereby making it harder to keep foremen. On our road, foremen are recognized for the work they perform and encouraged in every way from the highest officer down. All recognize their value and try to encourage them and this policy is giving great results.

There is one thing which I would strongly recommend in dealing with foremen. A foreman should receive his orders from his roadmaster, supervisor or division engineer. To allow station agents or men from other departments to call on the foreman for certain jobs, unless of course in emergency, is a practice which should be stopped; for where a foreman receives an order from someone other than his division engineer, supervisor, or roadmaster he gets somewhat careless, feeling that he is to be ordered by everybody and that his department does not demand the respect it should. This causes a lack of interest. Where work is called for it should be understood that it is to be put through its proper channel. That will place responsibility on the supervisor and the section foreman, so that it cannot be shifted, saying that they are called off on other work by other parties. It will make each one hold himself responsible for his part of the work. It will also, I think, give the section foreman more confidence and a feeling that he has equal rights with other men holding positions on the road. In my opinion, all reports from foremen should go to the supervisor whom they should report to.

With some such means of instruction and thereafter such intercourse of ideas as would be valuable, team work on the track is easily secured. And good team work will deliver more goods than any other single force. If we can have the opportunity of telling a man exactly how we want a certain piece of work done, and the best way of doing it, together with such explanation as will convince him that this is the best way, he will approach his work with twice as much enthusiasm as he would if it were being done mechanically on his part. His interest and intelligent co-operation with us will be a big help in track maintenance.

My most important thought is the establishment of a means of instruction for section foremen by seeing them often and walking over their section with them, presenting to them at frequent intervals the best methods of doing their work and the reasons therefor. The results, I am sure, will far outweigh the effort and time this plan would call for.—Maintenance of Way Bulletin.

Canadian Society of Civil Engineers Reorganization.—E. W. Oliver, Assistant Engineer, Canadian Northern Ry., Toronto, has been elected secretary of the committee appointed to enquire into and report on a policy for increasing the society's prestige and influence. H. E. T. Haultain, Professor, University of Toronto, is chairman of the committee and R. W. Leonard, St. Catharines, Ont., is vice chairman. Among the other members of the committee are Phelps Johnson, President, Dominion Bridge Co., Montreal; H. H. Vaughan, Consulting Engineer, C.P.R., Montreal; W. F. Tye, Consulting Engineer, Montreal; D. H. McDougall, General Manager, Dominion Coal Co., Sydney, N.S.; L. H. Wheaton, Railways and Canals Department, Dartmouth, N.S.; A. E. Doucet, ex-District Engineer, National Transcontinental Railway, Quebec; John Murphy, Electrical Engineer, Board of Railway Commissioners; H. B. Muckleston, C.P.R. Engineering Department, Brooks, Alta.; W. L. Mackenzie, Engineering Department, Canadian Northern Ry., Winnipeg; D. O. Lewis, District Engineer, Canadian Northern Pacific Railway, Victoria, B.C.

Saskatoon Stockyards.—An agreement has been reached under which the railway companies entering Saskatoon, Sask., will operate the stockyards to be laid out by the city council, until the city is in a position to do the work itself. The Saskatchewan Provincial Government has appropriated \$30,000 in aid of the laying out of the yards. It is expected that they will be ready for operation during September.

C.P.R. British Columbia Medical Association.—Following are the officers elected for the current year:—President, F. W. Peters; Vice President, G. R. Thompson; Secretary-Treasurer, A. M. Innes; Executive Committee:—A. S. Munro, Vancouver; R. H. Urquhart, Revelstoke; F. R. McCharles, Nelson. Dr. J. A. MacDonald has been appointed Medical Health Officer of the association.

The Togoland Military Ry., West Africa, is reported to have ordered 2 Mikado locomotives, 15 x 20 in. cylinders, 38 in. driving wheels, 96,000 lbs. total weight in working order, from the American Locomotive Co. Togoland is on the west coast of Africa, in the Gulf of Guinea, between the British Crown colonies of Gold Coast and Nigeria, and until recently was a German colony, but is now under British military rule.

Canadian Pacific Ry. Officials' Meeting at Winnipeg.

Canadian Railway and Marine World's last issue contained a brief mention of the meeting of C.P.R. officials held in Winnipeg July 17 to 20, at the instance of George Bury, Vice President, to discuss various topics relating to operation, etc. The committee of arrangements consisted of C. E. E. Ussher, Passenger Traffic Manager, as general chairman; A. Price, Assistant General Manager, A. C. MacKenzie, Engineer, Maintenance of Way, and H. J. Humphrey, Superintendent of Car Service, representing the Eastern Lines; D. C. Coleman, Assistant General Manager, F. Lee, Principal Assistant Engineer, and C. E. Stockdill, Assistant to Vice President and General Manager, representing the Western Lines. C. E. E. Ussher presided and C. E. Stockdill and H. J. Humphrey acted as joint secretaries. The following officials were present: J. D. Altimas, Car Accountant, Montreal; J. O. Apps, General Baggage Agent, Montreal; R. Armstrong, Superintendent, Souris; T. G. Armstrong, Master Car Builder, Winnipeg; R. Barnwell, Asst. Purchasing Agent, Winnipeg; J. M. Barrett, Superintendent of Terminals, Montreal; T. M. Barrett, Chief Commissary Agent, Montreal; J. E. Beatty, Division Engineer, Montreal; D. H. Bowen, Superintendent, of Telegraphs, Sudbury; H. H. Boyd, Superintendent, Vancouver; F. M. Breen, Superintendent, Montreal; T. Britt, General Fuel Agent, Montreal; H. W. Brodie, General Passenger Agent, Vancouver; M. H. Brown, Division Freight Agent, Toronto; J. M. Cameron, General Superintendent, Calgary; E. Choyce, Publicity Department, Montreal; D. C. Coleman, Asst. General Manager, Winnipeg; G. T. Coleman, Car Service Agent, Toronto; T. Collins, Superintendent, London; D. Coons, Superintendent Telegraphs, Moose Jaw; F. W. Cooper, Superintendent, Schreiber; W. A. Cooper, Manager S. D. & P. C. Dept., Montreal; C. A. Cotterell, Superintendent, Lethbridge; E. D. Cotterell, Actg. Supt. of Car Service, Winnipeg; E. A. Cunningham, Asst. to Gen. Storekeeper, Montreal. W. H. D'Arcy, General Claims Agent, Winnipeg; J. G. Davis, Telegraph Department, Montreal; C. T. Delamere, Engineer of Construction, Montreal; S. G. Denman, Asst. Purchasing Agent, Vancouver; A. C. Douglas, Asst. Gen. Purchasing Agent, Montreal; J. A. Douglas, Electrical Engineer, Winnipeg; R. W. Drew, Division Freight Agent, Regina; N. S. Dunlop, Tax and Insurance Commissioner, Montreal; E. W. Duval, Superintendent, Saskatoon; E. Eley, Master Car Builder, Montreal; W. S. Elliot, Division Freight Agent, North Bay; T. Fawcett, Assistant General Storekeeper, Winnipeg; J. T. H. Ferguson, Purchasing Agent, Calgary; T. R. Flett, Superintendent, Winnipeg; M. A. Fullington, Superintendent, Smiths Falls; F. E. Gautier, Purchasing Agent, Winnipeg; L. O. Genest, General Storekeeper, Winnipeg; A. A. Goodchild, General Storekeeper, Montreal; E. H. Goodfellow, Telegraph Inspector, Medicine Hat; H. C. Grout, General Superintendent, St. John, N.B.; W. C. Guthrie, Superintendent, Chapeau; John Halstead, Division Freight Agent, Calgary; W. B. Harris, Car Service Agent, Vancouver; A. C. Harshaw, Superintendent, Cranbrook; W. J. Hatch, Gen. Air Brake Inspector, Montreal; A. Hatton, Gen. Supt. of Car Service, Montreal; J. C. Holden, Division Engineer, Winnipeg; F. O. Hopkins, Asst. General Passenger Agent, Montreal; H.

J. Humphrey, Supt. of Car Service, Montreal; E. Humphreys, Storekeeper, Winnipeg; J. W. Hughes, Electrical Engineer, Montreal; G. C. Jackson, Freight Claims Auditor, Montreal; C. Kyle, Master Mechanic, St. John, N.B.; W. B. Lanigan, Asst. Freight and Traffic Manager, Winnipeg; Frank Lee, Principal Asst. Engineer, Winnipeg; C. L. Leighty, Inspector of Transportation, Winnipeg; C. S. Maharg, Superintendent, Brandon; J. M. Macarthur, Superintendent, Kenora; A. C. MacKenzie, Engineer Maintenance of Way, Montreal; C. D. MacKintosh, Superintendent, Medicine Hat; W. Marshall, Asst. Manager of Telegraphs, Winnipeg; W. A. Mather, Asst. General Superintendent, Vancouver; H. F. Matthews, Gen. Supt., S. D. & P. C. Dept., Winnipeg; J. H. Mills, Master Mechanic, North Bay; R. C. Morgan, Superintendent of Terminals, Fort William; C. Murphy, General Superintendent, Winnipeg; C. W. McBain, Real Estate Department, Winnipeg; S. B. McConnell, Division Engineer, North Bay; D. C. McDonald, Asst. Gen. Claims Agent, Winnipeg; Jas. McGowan, Supt. Engineer, B.C.C.S., Vancouver; A. T. McKean, Division Freight Agent, Winnipeg; R. McKillop, Superintendent, Montreal; J. McMillan, Manager of Telegraphs, Montreal; T. C. McNabb, Division Engineer, Moose Jaw; R. G. McNeillie, Asst. General Passenger Agent, Winnipeg; C. E. McPherson, Asst. Passenger Traffic Manager, Winnipeg; P. McPherson, Right of Way and Lease Agent, Winnipeg; W. D. Neil, Superintendent Telegraphs, Montreal; F. Palin, Insurance Inspector, Winnipeg; E. M. Payne, Superintendent Telegraphs, Winnipeg; P. R. Pennefather, Master Mechanic, Winnipeg; H. A. Plow, Division Freight Agent, Vancouver; R. Preston, Asst. Supt. of Motive Power, Winnipeg; A. Price, Asst. General Manager, Montreal; G. Priestman, Storekeeper, Vancouver; A. W. Porter, Supt. S. D. & P. C. Dept., Winnipeg; R. A. Pyne, Superintendent of Shops, Winnipeg; H. Rindal, Division Engineer, Vancouver; F. S. Rosseter, Resident Engineer, London; J. K. Savage, Superintendent, Regina; A. Sherwood, Manager, N. B. Ry., Fredericton; S. A. Simpson, Supt. S. D. & P. C. Dept., Moose Jaw; A. Bromley Smith, Engineering Dept., Montreal; A. L. Smith, Superintendent, Sudbury; G. H. Smith, Asst. Gen. Freight Agent, Winnipeg; W. H. Snell, General Passenger Agent, Montreal; J. Sparks, Asst. Gen. Baggage Agent, Winnipeg; H. B. Spencer, Superintendent, Ottawa; W. G. Stenson, Air Brake Inspector, Winnipeg; A. E. Stevens, General Superintendent, Moose Jaw; C. E. Stockdill, Asst. to Vice Pres. and Gen. Manager, Winnipeg; A. Sturrock, Master Mechanic, Vancouver; J. G. Sutherland, Car Service Agent, Calgary; F. Taylor, Right of Way and Lease Agent, Montreal; C. H. Temple, Superintendent of Motive Power, Winnipeg; W. M. Thompson, Supt. Traffic, Telegraph Dept., Montreal; H. P. Timmerman, Industrial Agent, Montreal; E. N. Todd, General Freight Agent, Montreal; I. G. Trudel, Storekeeper, Moose Jaw; C. E. E. Ussher, Passenger Traffic Manager, Montreal; O. C. Walker, Refrigerator Inspector, Winnipeg; Geo. A. Walton, General Passenger Agent, Winnipeg; S. Wertheim, Supt., S. D. & P. C. Dept., Toronto; Geo. Whiteley, Asst. Supt. of Motive Power, Montreal; A. Williams, Superintendent, Brownville; W. H. Winterrowd, Asst. to Chief Mechanical En-

gineer, Montreal; J. M. Woodman, Superintendent of Terminals, Winnipeg.

The morning of July 17 was devoted to organizing the meeting and to committee meetings, after which the officials were entertained at luncheon at the Royal Alexandra Hotel, by A. M. Nanton, of Winnipeg, one of the company's directors. The afternoon of July 17 and the whole of July 18 were devoted to discussing the subjects on the agenda. At night the officials left by special train for Camp Hughes which was gone over, partly in automobiles, on July 19. The afternoon and evening of that day were spent at the Brandon Exhibition. July 19 and 20 were devoted to further discussions at Winnipeg, an intermission being taken on the afternoon of July 20 to go over the company's Winnipeg terminals, in charge of J. Woodman, Superintendent of Terminals. While the party was at Transcona a train of 57 cars was switched over the hump in 11½ minutes, 23 cuts being made. The meeting closed on July 20 at 10.30 p.m. after which the officials enjoyed a couple of hours in social intercourse.

The agenda contained 26 subjects for discussion, as follows:—

Criticism various standards, types, etc. Maintenance of way standards. Equipment standards in relation to patrons of the road and regulating bodies. Equipment standards in relation to economical operation.

Distribution of power and cars: Between Eastern and Western Lines. Between General Superintendent's Divisions. Between Superintendent's Districts.

Freight Handling.—Terminal delays, rip track. Time elapsing between arrival in terminal and delivery to consignee. Loading of freight, carload and less than carload with view to maximum loading. Practice of advising consignees and shippers regarding movement of carload freight. Slow time made by freight trains. Continuous home route card. Overcoming errors and omissions in agents' interchange report form no. 65 and conductors' train journal form no. 125. Advisability of refusing to accept perishable shipments account frost during Dec., Jan., Feb., and March.

Locomotives.—System of numbering. Assignment of various types to territory for which they are best adapted. Type of freight locomotive to be constructed in future. Type of passenger locomotive to be constructed in future. Analysis of methods arriving at economical loads for freight locomotive engines.

Efficiency tests.

Regulation speed freight and mixed trains.

Stores.—Handling, Requisitions. Surplus and obsolete material.

Unnecessary duplication of work and correspondence. Under this head the district and divisional office organization system was considered.

Relations with the public.

Relations with employees, organized and unorganized, handling discipline and welfare of the staff.

Mental tests and examination for promotion.

Passenger train service. — Passenger service next winter. Smooth handling of trains. Instructions to new passenger conductors. Observation cars on special and regular trains. Uniformed trainmen on special passenger trains. Reduction of damage to passenger equipment account scraping and rubbing by station trucks. Time lost at way stations. Collection of tickets and fares. Locomotive and car defects and failures.

Time and time tables.—Twenty-four hour system, vs. a.m. and p.m. Information to the public re late trains. Permanent time at Fort William for transcontinental trains. Furnishing proofs of working time tables sufficiently ahead to admit of proper advertising.

Relations between railway lines and steamship lines.

Fuel. Handling and consumption at stations, at stationary boilers, on locomotives, and on steamships. Utilizing old ties for fuel. Fuel tickets furnished fuel department, not giving correct information.

tion.

Types of snow fighting equipment.

Necessity alterations in certain series of 40 ton steel frame box cars.

Discussion of sleeping and dining car service in relation to public and operation of road.

Freight claims.

Stations and staff.—General appearance, station gardens, etc. Providing fences and gates to control public. Inspection of tickets prior to passengers entraining. Prizes to stations for increased receipts.

Relations between traffic department and operating officers.

Economy in use Pintsch gas and electric light on cars.

Telegraph service.—Shortening of telegrams. Handling of important business in telegraph offices.

Economical handling of passenger cars. —Discussion as to allotment of this work to one department.

Handling of insurance survey reports.

Handling cinders and ice in terminals.

Uniform system of reporting accidents, slides and washouts. Industrial sites.

Unique Engineering Features of C.P.R. Bridge in British Columbia.

By E. B. Skeels, Resident Engineer, C.P.R., Lethbridge, Alta.

The C.P.R.'s Granby Subdivision is a spur from the Boundary Subdivision to Granby smelter, over which ore and coke are hauled to the smelter. The old crossing of the Kettle River at Bude, mileage 1.3, consisted of a 160 ft. dock Howe truss, with a 20 degree curve approaching one end and a 22 degree curve on the other end. The new structure (bridge 1.3) consists of one 30 ft. deck plate girder, one 120 deck lattice span, 2 skew deck plate girders spans of a total length of 150 ft., on a change of line eliminating the heavy curves and permitting erection without interruption to traffic.

was done, two base lines were laid out, one on each bank, so that one would be used as a check on the other in assuring accuracy. The result of the first triangulation gave a check of half a tenth of a foot. This was not considered accurate enough, but as there was other urgent work to be done, the rechecking was postponed. It was a month before the opportunity was presented to recheck the work, and again a check of half a tenth was made on the day's work, but the result was practically one tenth longer than the previous month's results. The angles were added four times in reading them,

tween hubs on this date was found to be one tenth longer than the previous month and two tenths longer than two months previous. The work was gone over carefully the following day, but the distance was practically the same. It was then arranged to have another instrument man check the work with other chain men, although chain men had been changed around on the work previously, and various methods of chaining the base lines were carried out, distance and elevation between points being taken and true distance computed. Chains were also checked and different chains used in measurements of base lines. When piers 2 and 3 were built two base lines were checked separately.

It was again a month after that when the work was all gone over by the second instrument man, angles being added six times to give accuracy. The results showed the nearest checks to be one half thousandths and the greatest difference to be twenty-eight thousandths.

It was after this last check had been made that it was decided that the contraction of the rock of the canyon walls was responsible for the differences, due to cold weather, there having been a period when the thermometer registered from 20 to 35 degrees below zero daily. The matter was then referred to the Division Engineer and to the Chief Engineer, J. G. Sullivan, who arranged to have larger rollers placed under one end of the 120 ft. deck lattice span, which rested on a pier built on the south side of the river.

Checks were made of the distances monthly, covering a period of 15 months, which showed an expansion and contraction difference of approximately six tenths of a foot, or about $7\frac{1}{4}$ in. in the year. The temperature varies from 35 degrees below zero to 102 above in the shade. The figures given are approximate, and are as close as can be remembered.

The old Howe truss span had always given considerable trouble, it being necessary to line it, as it shifted on its end bearings. No reason could be given, as there were wooden trestle approaches to the span which received the thrust of trains on the curves, until the facts above recorded were found. The rock is of a very hard formation, being of a flinty granite, the hardest encountered in the Boundary district.

The writer is indebted to John R. Grant, M. Can. Soc. C.E., of Cartwright, Matheson & Co., Vancouver, for the suggestion as to the solution of the cause of the canyon apparently widening, and for searching for information showing that a similar case had been found in Mexico, where



Bridge 1.3, Granby Division, C.P.R., over Kettle River.

When laying out the work for building the granite masonry piers and abutments it was necessary to triangulate to determine the distance across the canyon, the walls being too precipitous to permit of chaining. Triangulation hubs consisted of 1 in. holes drilled in the solid rock and plugged with wooden plugs, finishing nails of 1 in. length being used as points, and small, round hardwood toothpicks being held on these points for back and foresights.

The distance between hubs on the centre line of bridge was approximately 341 ft. When the first triangulation work

so that the average angles were reduced to seconds. When the result was found to be one tenth longer than the previous work the work was rechecked, but the result was the same.

Again, a month elapsed before a check was made, and this time two more base lines were laid out, one on each bank, thus having four triangulations for checking purposes. The excavation for the piers was proceeding during this past month. When the results of the four triangulations were compared the check showed the greatest difference to be twenty-five thousandths, but the length be-

there is a wide range in temperature.

EDITOR'S NOTE—We are indebted to D. C. Fraser, Bridge and Building Master, C.P.R., Nelson, who brought the in-

teresting facts above mentioned to our notice, as a result of which we obtained the interesting article which Mr. Skeels has kindly contributed.]

High Level Air Pump on National Transcontinental Railway at Quebec.

An interesting air lift plant has been installed for supplying the National Transcontinental Ry. locomotive house, power house and yards at the Quebec bridge. The neighborhood of the St. Lawrence River would seem to be an anomalous location, but several considerations operated to determine the installation. The rise and fall of the tide, the height of the embankment and the unsuitability of the river water, were important points, and besides this the use of the river water would have necessitated the construction of a pumping plant at a distance from the power house, and would have increased the cost of attendance.

Work was started in Sept. 1912. Forty-three feet of 8 in. wrought iron

The air-lift system was adopted owing to its numerous advantages over other systems of deep well pumping, as with this system there are no moving or wearing parts in the water, and the air compressor may be located at any distance from the well. In lowering the pipes and footpiece, which were extra heavy, great care was required because of the weight; but there was no mishap of any kind.

The air-compressor is a Canadian Ingersoll-Rand tandem compound steam driven machine, designed for a terminal pressure of 250 lb. and the air cylinders are fitted with the circo-leaf valve, which is noiseless in operation. The frame is fully enclosed, and the moving parts work in a constant flood of oil. A com-

power house. A gauge over each line shows the pressure and indicates the fall of the water in the well.

Air discharges from the compressor into a high pressure air receiver and from there to the well. The first air line starts the water flowing and continues to pump until the well lowers as far as this line is capable of lowering it. Then the first air line is gradually turned off until the second line begins to act. When this line has lowered the water as far as it is capable of lowering it, the work is taken up by the third line and the second line is closed. The third line, which is the main pump line, then continues to furnish air as long as the system is in operation. The object of the first two lines is to enable the accumulation of water in the well to be pumped away without resorting to an abnormally high air pressure. These lines are only used in starting the system.

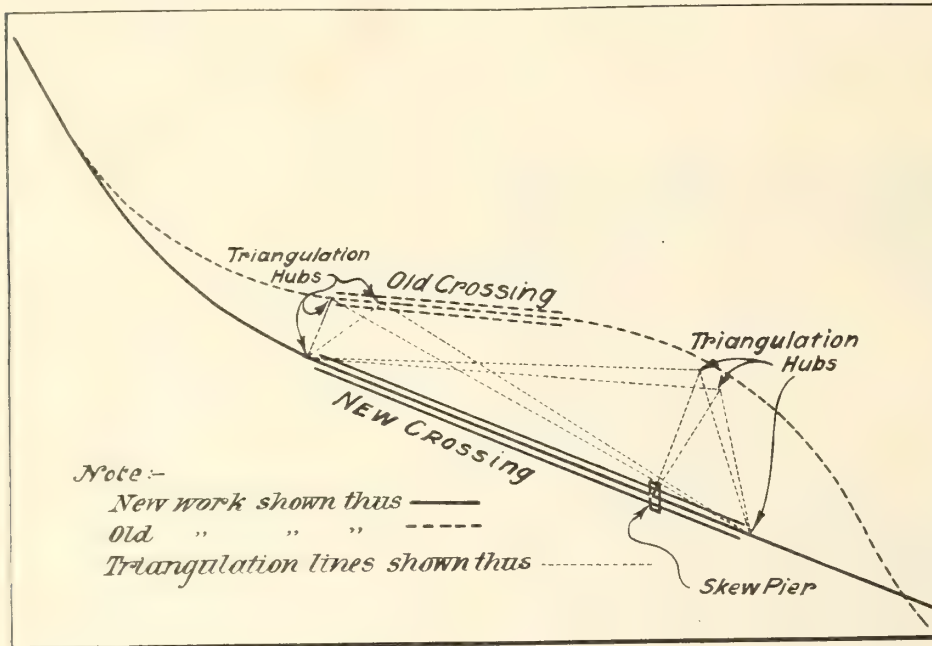
The yield of the well is 5,400 imp. gal. per hour delivered into the tank, and under continuous operation the air pressure at the receiver is about 160 lb. When the system is first started the yield reaches a total of about 6,000 imp. gal. per hour, this being due to the accumulation of water filling the well to the surface. The yield gradually decreases under continuous operation until the normal capacity and pumping head are reached.

At the surface the water has to be pumped horizontally a distance of 60 ft., and subsequently to a height of 90 ft. into the top of the steel tank. For this work a booster operates in conjunction with the airlift. This booster consists of a steel tank resting on the top of the well casing and receiving the water as it discharges from the well. The operating parts consist of a float and valve located inside the tank. The water and air are separated in this tank, the air rising to the top and maintaining sufficient pressure to force the water to the elevated tank. As the solid column of water discharges the float drops, allowing the surplus air to exhaust from the tank. This whole operation requires only a few seconds, as a discharge takes place every time the booster is about two-thirds full. In fact, practically a constant flow is maintained.

The surplus air may be piped back to the compressor intake or discharged into the vertical riser to lighten the column of water and reduce the operating pressure. This latter plan was followed for the Quebec plant. The booster is automatic in operation and requires no attention. It also operates without noise. This apparatus is located in a concrete sump below the ground and is reached through a door in the roof. A by-pass is connected to the main drain so that the well can be pumped directly into the sewer for cleaning purposes.

The plant was operated by the contractors for several days under the supervision of Alex. D. Porter, who was then Assistant Engineer of the National Transcontinental Ry., and who at the completion of the test said the plant was entirely satisfactory, and one of the most reliable of the various railway divisional pumping units.

The high lift in this case is a noticeable feature, amounting to about 500 ft. vertical and 60 ft. horizontal. It demonstrates as far as it goes that there is practically no limit to the height to which the air lift will raise water if a fair amount of submergence is obtainable. On a test recently the plant pumped nearly 6,000 gal. per hour, but this



Bridge 1.3, Granby Division C.P.R., over Kettle River.

pipe was driven from the surface to the rock, and from that point a 5-in. bore hole was started. The well was drilled entirely in shale, red and grey alternating. On Sept. 30 a depth of 400 ft. had been reached, and a rough pumping test yielded 200 imp. gal. per hour. At 280, 520, and 700 ft. respectively, dry crevices were encountered, while at 775 ft. water was struck in considerable quantity. The hole was then reamed to a diameter of 8 in., and a subsequent test yielded 3,200 imp. gal. per hour. At a depth of 980 ft. and at a depth of 1,012 ft. drilling was discontinued. The whole well was then reamed out to 8 in. diameter. A large plunger pump was used for a 24-hour test, and with 400 ft. of rods in the well a yield of 5,400 imp. gal. per hour was maintained. The pump was afterwards operated for eight days to clean out the well, and a sample of water was analyzed and reported satisfactory for both boiler and domestic purposes. When the well is not being pumped water rises to the surface; when being pumped to capacity it drops, however, to a depth of 400 ft. from the surface.

bined speed and pressure governor controls the compressor. The volume of water is carried by an air jet situated below a choker, which arrangement eliminates slippage and causes the air to be distributed through the water in small bubbles. Water is discharged into a steel tank 24 ft. in diameter, and the total capacity, including the leg, is 61,170 imp. gal. The level of the water in feet is indicated by a marker on the outside of the tank, and by this means it is possible to accurately gauge the capacity of the plant. The tank is supported by a steel frame resting on a concrete base, in which are located the valves and connections to the service mains and to the main drain. Steam is furnished to the compressor at 130 lb. pressure.

Owing to the depth to which the water drops in the well, air lines are used, 2 being tapped into the water discharge line at different depths, and the third entering the foot-piece. Each of these three air lines is controlled by a globe valve in the power house, and the engineer operates the system without going near the well, which is 250 ft. from the

Canadian Railway AND Marine World

ESTABLISHED 1898

Devoted to Steam and Electric Railway,
Marine, Express, Telegraph, and Railway and Canal
Contractors' Interests.
Official Organ of various Canadian Transportation
Associations.

Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A.Can.Soc.C.E.
Managing Director and Editor-in Chief.
AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editors
JOHN KEIR AND DONALD F. KEIR

Canadian Business Representative,
W. H. HEWITT, 70 Bond Street, Toronto
United States Business Representative,
A. FENTON WALKER, 143 Liberty St., New York
European Business Representative,
J. MEREDITH MCKIM, 16 Regent St., London, Eng.

Authorized by the Postmaster General for Canada,
for transmission as second class matter.
Entered as second class matter, July 25, 1913, at the
Postoffice at Buffalo, N.Y., under the Act of Congress
of March 3, 1879.

SUBSCRIPTION PRICE, including postage any-
where, \$2 a year.

SINGLE COPIES, 20 cents each, including postage.
The best and safest way to remit is by express money
order. Where one cannot be obtained, a post office
money order, or bank draft, payable at par in Toronto,
may be sent. Cheques or drafts not payable at par in
Toronto cannot be accepted. Remittances should be
made payable to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.
ADVERTISING COPY must reach the publishers by
the 10th of the month preceding the date of publication.

TORONTO, CANADA, SEPTEMBER, 1916.

PRINCIPAL CONTENTS.

Appointments, Transportation	370
Birthdays of Transportation Men	355
Board of Railway Commissioners,—	
Orders by, Summaries of	356
Traffic Orders	372
Canadian Northern Ry. Construction	361
Vancouver Station	358
Canadian Pacific Ry. Construction	361
Earnings for the Year	359
Engineering Plan Room	349
Officials' Meeting at Winnipeg	366
Quebec Union Station	360
Wage Increases	373
Electric Railway Department	374 to 380
Detroit's Interurban Service	374
Electric Railway Topics	380
Finance, Meetings, Etc.	379
Hamilton, Grimsby & Beamsville Electric Ry., Lavatory Accommodation	377
Hydro Electric Railways in Ontario	379
Montreal Tramways Co.'s Report	375
Projects, Construction, Etc.	378
Sudbury-Copper Cliff Suburban Electric Ry. Toronto Suburban Ry., Change of Gauge, Etc.	377
Freight and Passenger Traffic Notes	357
Grain in Store at Terminal Elevators	371
Mainly About Railway People	362
Marine Department	381 to 390
Dominion Government Dredge for St. Law- rence Ship Channel	381
Panama Canal Act and Steamboats with Canadian Connections	386
Sault Ste. Marie Canals Traffic	387
Vessels Registered	386
National Transcontinental Ry. High Level Air Pump at Quebec	368
Welding at Winnipeg	354
Railway Development	364
Railway Earnings	371
Railway Finance, Meetings, Etc.	359
Railway Operating Expenses Increases	351
Railway Rolling Stock Notes	360
Section Forces, Selection of	365
Telegraph, Telephone and Cable Matters	390

The Canadian Northern Quebec Ry. accounting office is being removed to Toronto, in connection with the work of centralizing the C. N. R.'s entire office system in Toronto.

capacity was due to accumulated water near the well. The normal capacity (5,000 gal. per hour) was developed continuously after the level dropped to 400 ft. At this point the running pressure was 160 lb. per sq. in. The highest pressure required for starting was 225 lb.

Canadian Import Co's Vessels.

The names of the steamships Collinge, John Duncan, and Pueblo, registered under nos. 138,096, 133,821 and 133,822, respectively, by L. C. Webster, Montreal, have been changed to Stuart W., Howard W., and Richard W. Companies have been incorporated in connection with each vessel, and the vessels are being operated in the interests of the Canadian Import Co., of which L. C. Webster is President. The s.s. Collinge was formerly owned by F. Peterson, Oswego, N.Y., and was built at Cleveland, Ohio, in 1881. She is of oak with diagonal strapping on framing, bow sheathed for ice, and with steel boiler house; dimensions,—length 251 ft., breadth 38 ft., depth 21¼ ft.; tonnage, 1,601 gross, 1,280 register. She is equipped with fore and aft compound engine with cylinders 21 and 44 ins. diam. by 48 ins. stroke, 700 i.h.p. at 70 r.p.m., and supplied with steam by a Scotch boiler, 12½ by 11½ ft., at 140 lbs. pressure. The s.s. John Duncan was formerly owned by the Canada Cement Transportation Co., Montreal, and was built at Fort Howard, Wis., in 1891, and rebuilt in 1913. She is of oak with diagonal strapping on framing and iron lined boiler house; dimensions,—length 225 ft., breadth 38 ft., depth 20¼ ft.; tonnage, 1,517 gross, 924 register. She is equipped with fore and aft compound engine with cylinders 24 and 48 ins. diam., by 40 ins. stroke, 600 i.h.p. at 92 r.p.m., and supplied with steam by a firebox boiler 10½ by 16 ft., at 130 lbs. The s.s. Pueblo was formerly owned by the Canada Cement Transportation Co., and was built at Milwaukee, Wis., in 1891 and rebuilt in 1913. She is of oak with diagonal strapping on framing, bow sheathed for ice, steel boiler house, two non-water-tight bulkheads, and steam pump wells; dimensions,—length 228 ft., breadth 36¼ ft., depth 16 ft.; tonnage, 1,493 gross, 905 register. She is equipped with fore and aft compound engine with cylinders 23 and 46 ins. diam. by 42 ins. stroke, 500 i.h.p. at 75 r.p.m., and supplied with steam by a Scotch boiler 12 by 12½ ft., at 127 lbs.

Railway Laborers "Jumping" Jobs.—

During the present season the C.P.R. has suffered considerable loss at Western points owing to men engaged on summer gangs "jumping their jobs," after they had been provided with transportation. The contract called for the men remaining during the season, or paying the cost of transportation if they left before its expiry. Ten men have been fined—in two cases the fines were \$20 each—for

The Dominion Contracting Co., Vancouver, B.C., is being voluntarily liquidated, W. S. Lane, having been appointed liquidator by the shareholders.

Boston & Maine Rd. Receivership. Application has been made at Boston, Mass., for the appointment of a receiver for the Boston & Maine Rd.

The Quebec Ry. Light & Power Co. is building 3 double truck payee cars, at its own shops. They will be similar to one completed recently and numbered 650, the new ones being numbered 651 to 653.

Grounding of the s.s. English Monarch.

An investigation into the grounding of the British s.s. English Monarch at or near Bird Rock, N.S., July 24, was held at Sydney, N.S., Aug. 1, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. A. J. Morrison and R. Macdonald, as nautical assessors. The court, after considering the evidence, which was slightly contradictory on some points, most of which had no material bearing on the case, found that the master, from the time he left Father Point until he reached Fame Point, navigated his vessel in a very careful manner, that he obtained his proper position off Fame Point, and that the weather became thick shortly after and he steered a course which would have brought him some 10 miles from Bird Rock on the north side. Being a stranger on the coast he received advice and counsel from experienced navigators, who are acquainted with this neighborhood, and was warned to be careful of a possible current which might throw him off to the north of his course leading to Bird Rock. He followed this advice to a certain extent, but had he been left to his own devices and read the Sailing Directions, he would have found that there is a current from Cape Race flowing into Cabot Strait, which has a tendency to bring vessels to the south instead of the north, to the shores of Newfoundland. A good lookout was kept and soundings were taken. Immediately before the whistle at Bird Rock was heard a sounding of 19 fathoms was obtained and the helm was put hard astarboard, the vessel going about 5 to 6 knots an hour. After proceeding in this manner for a short time, she struck. The vessel was kept going at full speed for three minutes, when he succeeded in releasing it from the point where it struck, and finding that the vessel was not making too much water, a course was shaped for St. Pauls, and he got into wireless communication with the shore, being subsequently met by a patrol boat and conveyed into Sydney. The court expressed the opinion that the master, R. H. Potter, did not take enough soundings, as he was a stranger in those waters. When he obtained a sounding of 60 fathoms, if he had continued taking frequent casts, he would have found out that he was in the bank of shallow water lying northerly from Bird Rock, and therefore in a dangerous position. The main point, however, to which the court directed its criticism was that the master, when he got the sounding of 19 fathoms, did not go full speed astern until he deepened his soundings, and then navigated cautiously until he ascertained his position exactly. The court took into consideration his excellent career and his methodical manner of navigating his vessel previously, and in making entries in his log, even showing every figure entering into his calculations which he had made to obtain the position of his vessel for days and months before the accident, which the court stated it had not the good fortune to see frequently. In view of these facts and his clean record, the court would not deal with his certificate but severely reprimanded and censured him for his error of judgment, and cautioned him to be more careful in the future. Prior to taking command of the s.s. English Monarch, the master, Capt. R. H. Potter, was master of the s.s. Scottish Monarch, which was torpedoed by a German submarine after a fight, 12 of the crew being killed.

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canadian Government Railways.—A. J. ROY, heretofore ticket agent, Levis station, Quebec, has been appointed City Ticket Agent, Montreal, vice G. Strubbe, deceased. (See also Intercolonial Ry. and National Transcontinental Ry.)

Canadian Northern Ry.—A. FORD, heretofore chief clerk to Storekeeper, Quebec Division, Limoilou, Que., has been appointed Storekeeper, Joliette, Que., vice H. B. Akin, transferred.

A. J. HILLS, heretofore General Superintendent, Eastern Lines, having been assigned to other duties, the matters heretofore handled by the General Superintendent have been assumed by the General Manager. Mr. Hills is now attached to the Third Vice President's office, performing such duties as are assigned to him from time to time.

GEORGE COLLINS, heretofore Superintendent of Branch Lines, Trenton, Ont., has been appointed Special Representative, reporting to the General Manager, Eastern Lines Office, Toronto.

G. A. HOAG, heretofore Assistant Superintendent, Rosedale, Toronto, has been appointed Assistant Superintendent of the Picton, Maynooth, Tweed, Irondale and Brockville Subdivisions, and Trenton yard, Toronto District, reporting to the Superintendent. Office, Trenton, Ont.

H. B. AKIN, heretofore Storekeeper, Joliette, Que., has been appointed Storekeeper, Ontario Division, vice E. D. Toye resigned on enlistment for active service overseas. Office, Trenton, Ont.

C. L. HARRIS has been appointed Assistant Superintendent, Muskoka, Trenton and Rideau Subdivisions, Toronto District, reporting to the Superintendent. Office, Rosedale, Toronto.

J. E. BERRY, heretofore Yardmaster, Regina, Sask., is reported to have been appointed Yardmaster, Saskatoon, Sask.

J. MADILL, heretofore City Passenger Agent, Edmonton, Alta., has been appointed District Passenger Agent, with territory covering Alberta. Office, Edmonton.

W. F. BARRY, heretofore City Freight Agent, Montreal, has been appointed Commercial Agent, San Francisco, Cal. Office, 561 Santa Marina Bldg.

Owing to the sale of the vessels heretofore operated by Canadian Northern Steamships Ltd., to the Cunard Steamship Co., the offices at Birmingham, Bristol, England, and Cardiff, Wales, have, with the staffs there, been transferred to the Cunard Steamship Co., as have also the C. N. S. Ltd. staffs at London and Avonmouth. The office at Leadenhall St., London, E.C., has been closed and removed to 9 Bishopsgate, London, E.C.

The Canadian Northern Ry. Freight and passenger staff, as reorganized, is as follows:—

General Freight Agent, G. E. COWIE, office, 9 Bishopsgate, London, E.C.

General Passenger Agent, W. J. CARTMEL, office, 21 Charing Cross, London, S.W.

Travelling Freight Agent, A. T. SHAW, office, 9 Bishopsgate, London, E.C.

Travelling Passenger Agent, F. E. BIRCH, office, 21 Charing Cross, London, S.W.

District Freight and Passenger Agent, E. L. ROPER, office, Cunard Building, Liverpool.

District Freight and Passenger Agent, R. J. McEWAN, office, 125 Hope Street, Glasgow, Scotland.

J. DEED, heretofore District Agent, Canadian Northern Steamships, Ltd., Birmingham, has been appointed chief clerk to General Freight Agent, London.

Canadian Pacific Ry.—W. B. BROWN, heretofore Assistant Superintendent, District 2, Eastern Division, Montreal, has been appointed Car Service Agent, Atlantic Division, vice E. J. Worth transferred. Office, St. John, N.B.

W. H. McGAAN has been appointed Roadmaster, District 2, Atlantic Division, vice J. H. Guthrie transferred. Office, Aroostook Jct., N.B.

W. J. CRAIG has been appointed acting Roadmaster, Edmundston, Aroostook and Tobique Subdivisions, Atlantic Division, vice W. H. McGaan, transferred. Office, Aroostook, N.B.

J. H. GUTHRIE, heretofore Roadmaster, Aroostook Jct., N.B., has been appointed Roadmaster, Brownville Jct., Me., vice L. Berger, transferred.

J. A. METIVIER, heretofore assistant ticket agent, and commercial telegraph operator, Sherbrooke, Que., has been appointed City Passenger Agent there, vice E. H. Sewell, deceased.

H. R. MILES, heretofore Resident Engineer, District 1, Lake Superior Division, Sudbury, Ont., has been appointed Assistant Engineer, Montreal.

C. J. KAVANAGH, heretofore Superintendent, District 4, Ontario Division, Toronto, has been appointed Superintendent, District 2 (Montreal Terminals), Eastern Division, vice J. M. Barrett. Office, Montreal.

J. S. BYROM, heretofore Superintendent, Great Lakes Steamers, C.P.R., Port McNicoll, Ont., has been appointed Gen- and Parlor Cars and News Service, Eastern Lines, vice A. Rutledge, transferred. Office, Montreal.

E. J. WORTH, heretofore Car Service Agent, Atlantic Division, St. John, N.B., has been appointed Chief Dispatcher, Ottawa, Ont.

L. BERGER, heretofore Roadmaster, Brownville Jct., Me., has been appointed Roadmaster, Smiths Falls Subdivision, Eastern Division. Office, Smiths Falls, Ont. N. BERGER is Roadmaster at Smiths Falls, Ont., in charge of construction work in connection with the enlargement of the yard there, as announced in our last issue.

J. MILES, heretofore General Yardmaster, West Toronto, has been appointed acting Superintendent, District 4, Ontario Division, vice C. J. Kavanagh transferred. Office, Toronto.

G. W. JACKSON, heretofore Night Yardmaster, West Toronto, has been appointed General Yardmaster, there, vice J. Miles, promoted.

H. A. AMY, heretofore Locomotive Foreman, Schreiber, Ont., has been appointed Locomotive Foreman, Cartier, Ont.

R. S. DICKSON has been appointed Locomotive Foreman, Schreiber, Ont., vice H. A. Amy.

R. BARNWELL, heretofore General Tie Agent, Western Lines, Winnipeg, has been appointed Assistant Purchasing Agent, Western Lines, there, and his former position has been abolished.

clerk to District Passenger Agent, Winnipeg, has been appointed City Ticket Agent there.

G. BEESTON, heretofore in the station ticket office, Winnipeg, is reported to have been appointed chief clerk to District Passenger Agent, Winnipeg, vice J. F. Speakman promoted.

W. G. McGUINNESS, ticket agent, Brandon, Man., is reported to have been appointed ticket agent, Winnipeg, vice C. R. Hayward, assigned to other duties.

A. WEST, heretofore District Master Mechanic, District 4, Alberta Division, Edmonton, has been appointed District Master Mechanic, District 3, Manitoba Division, vice A. E. Dales, transferred. Office, Brandon.

P. J. SIVERTON, heretofore repair track foreman, Ogden, Alta., has been appointed Car Foreman, Swift Current, Sask.

A. E. DALES, heretofore District Master Mechanic, District 3, Manitoba Division, Brandon, has been appointed District Master Mechanic, District 4, Alberta Division, vice A. West, transferred. Office, Edmonton.

W. H. ORMAN, has been appointed repair track foreman, Ogden, Alta., vice P. J. Siverton, transferred.

The Sirdar, Waldo, Kingsgate, Kimberley, Kootenay Central and Cranbrook Subdivisions, heretofore operated as District 5, Alberta Division, have been transferred to the British Columbia Division, and are being operated as District 4, British Columbia Division.

Canadian Pacific Ocean Services Ltd.—KENNETH MCKENZIE has been appointed Superintendent Engineer in England.

T. G. TURNBULL, Passenger Agent, Shanghai, China, has, since the appointment of J. R. Shaw as General Agent, Passenger Department there, as announced in our last issue, been granted leave of absence.

J. H. WALLACE has been appointed General Agent, Freight Department, for China, Straits Settlement, India, etc. Office, Hong Kong, China.

L. E. N. RYAN has been appointed Freight Agent, Shanghai, China.

Duluth, Winnipeg & Pacific Ry.—W. F. BARRY, heretofore City Freight Agent, Canadian Northern Ry., Montreal, has been appointed Commercial Agent, D. W. & P. R., San Francisco, Cal. (See also Canadian Northern Ry.)

Grand Trunk Ry.—The following station agents have been appointed: South Durham, Que., F. A. Leclerc; Britannia Mills, Que., E. Raboin; Levis, Que., J. L. Mignault; Dominion, Que., R. Young; Aubrey, Que., K. J. Mills; Brockville, Ont., A. E. Parker; Findley, Ont., C. F. Earle; Shannonville, Ont., R. L. Gilligan; Sarnia Tunnel, Ont., J. Simpson; Chatham, Ont., E. W. Bancroft; Vars, Ont., E. Needham; Joe Lake, Ont., F. A. Hawkshaw; Cornwall Jct., Ont., G. E. Macdonald; Sutton, Ont., A. M. Paton; Collingwood, Ont., and Collingwood Wharf, A. M. Durnford; Glencairn, Ont., J. Orr; Avening, Ont., M. Stacey; Bright, Ont., W. A. Blyberg; Kippen, Ont., W. Fasken; Camp Borden, Ont., R. W. Thom; outside agencies, St. John's, Que., C. G. Wilkinson; Brighton, Ont., G. A. L. Thorne; Oshawa, Ont., A. J. Adams; Parry Sound, Ont., G. Moore; Port Hope, Ont., A. Mark.

Traffic Orders by the Board of Railway Commissioners.

Interchange at Battleford.

25076. June 14. Re application of Board of Trade of North Battleford, Sask., for a transfer accommodation at Battleford (old town) between the Canadian Northern Ry. and the Grand Trunk Pacific Ry. It is ordered that the Grand Trunk Pacific Branch Lines Co. be directed to construct a transfer and storage track at Battleford, between the G. T. P. Ry. and the C. N. R., as shown on plan on file with the Board, that the said construction be completed by July 15, 1916; that the G. T. P. B. L. Co. bear four-fifths and the C. N. R. Co. one-fifth of the cost of construction, the said companies to furnish without charge the necessary land on their respective rights of way for the said transfer and storage track and that the cost of maintenance of the transfer and storage track be borne equally by the said railway companies.

The Chief Commissioner gave the following judgment at the sittings held at Saskatoon, on July 22, after the parties interested had been heard, an order was made giving effect to the application, and requiring the construction of a transfer and storage track between the G. T. P. Ry. and the C. N. R. at Battleford. The order calls for the completion of the transfer and storage track by July 15. This date was fixed at the hearing, without objection by the G. T. P. Ry. as allowing insufficient time in which the work might be done. Mr. Hansard, Solicitor for the G. T. P. R., now writes the Board stating that his company's Operating Department will not be able to get the track work completed until from August 10 to 15, and presumes that this will be satisfactory to the Board, so long as the work is being prosecuted in good faith, without the necessity of securing a further order extending the time for construction. It is important that the district affected should obtain the benefit of this transfer track for the autumn business. On the other hand, the Board is aware of the difficulties that at present prevail in obtaining material and men. Under the circumstances, an order may go extending the time for completion until Aug. 10. This does not mean that the work in the meantime is to be allowed to stand. On the contrary, it must be pressed forward as much as possible by the G. T. P. R. One of the Board's inspectors will check up the work and report progress.

Order 25191. was passed July 25, extending the time for the completion of the work to Aug. 10.

Minimum Weight of B.C. Lumber.

25205. July 26. Re complaint of British Columbia Lumber & Shingle Co., Vancouver, Riverside Lumber Co., Calgary, Alta., A. B. Cushing Lumber Co., Calgary, and Mountain Lumber Manufacturers' Association, Nelson, B.C., against proposed increase by C.P.R. in minimum weight of fir, spruce, hemlock, and common cedar lumber loaded in cars under 36 ft. long, from 30,000 to 35,000 lbs. It is ordered that the railway companies which on May 15, 1916, increased the minimum carload weight applicable to lumber and articles taking lumber rates from points of shipment in British Columbia and Alberta, when loaded in cars under 36 ft. long from 30,000 lb. to 35,000 lb, modify the said increased minimum by providing the minimum weight of 30,000 lb. for cars of the capacity of 2,050 cu. ft. or less; the said

modification to be published and filed immediately upon the receipt of this order, and to destinations in Canada, to be made effective forthwith.

Rates on Ores and Concentrates.

25211. July 27. Re complaint of British Columbia Mining Association against increased rates on ores and concentrates published in C.P.R. Tariff, C.R.C. no. W-2168, to take effect Aug. 1, 1916, from points of shipment in B.C.: It is ordered that the said increased rates be suspended until further order.

Pig Iron, Welland to Montreal.

25250. Aug. 3. Re complaint of F. L. Getzler of Montreal, against the 10th class rate of 16c charged on pig iron, in carloads, Welland to Montreal, in May, 1912, instead of the combination of 10th class 6c per 100 lb. to Hamilton, plus the commodity rate of \$1.75 a gross ton, Hamilton to Montreal. It is ordered that the complaint be dismissed.

Commissioner McLean gave the following judgment: Application was made by F. L. Getzler, a representative of a rate adjusting bureau known as The Canadian Transportation Rates. The applicant desired to be advised whether it was permissible to use a class and commodity rate in order to "defeat the through rate." It was stated that certain shipments of pig iron moved from Welland to Montreal through the period when there were no commodity rates on pig iron. Shipments were charged at the 10th class rate of 16c. The contention of the applicant is that the class rate of 6c from Welland to Hamilton, plus a commodity rate of \$1.75 a gross ton published through the season of navigation, during which period the shipments moved, should have applied. It was stated that there were three shipments concerned as follows: May 22, 1912, weighing 109,100 lb.; May 14, 1912, weighing 108,340 lb.; May 9, 1912, weighing 97,260 lb. The shipments in question took place some four years ago, and as was stated by the applicant at the hearing the matter involved was simply a question of refund. There is no evidence that any application was made to the railway for a commodity rate from Welland, nor is the question of a commodity rate basis from Welland before the Board in the present application. It was pointed out in the judgment of the Board in the matter of through rates vs. combination of locals that "it is a fundamental proposition under the policy outlined by the Railway Act that when a rate, whether joint or whether limited to points situated on one line of railway alone, has come into force in conformity with the provisions of the Railway Act, it is the only legal rate in respect of the traffic mentioned and between the points mentioned." There is no question as to the rate from Welland having been the rate legally in force. The Board has no power to direct a refund, but it may by a declaratory order state what is the proper tariff of tolls applicable to a certain class of goods, although no consequential relief is granted the applicant. Grand Trunk and Canadian Pacific Ry. Cos., vs. Canadian & British American Oil Cos., 13 Can. Ry. Case, 201. The Board has thus power to declare what is the legal rate; and if the rate charged is in excess of what is declared to be the legal rate, it is open to the parties to obtain a return of the excess through appropriate legal process. In the present application,

there is no question as to what was the rate legally in force when the shipments moved, and so there is no justification for a declaratory order. The Board's power in the present application is limited to declaring what is a reasonable rate for the future; but no application for this is before it. The application should be dismissed. Reference may be made to memorandum re through rates on lumber exceeding the sum of the locals, file 24647, Oct. 20, 1914.

New York Central Rd., and Ottawa and New York Ry. Tariffs.

25257. Aug. 11. Re order 23831, Feb. 2, 1915, suspending certain tariffs published and filed by the New York Central Rd. and the Ottawa & New York Ry., in so far as they increase the rates charged from stations in Canada to stations in Canada. Upon its appearing that the said railway companies now desire to publish rates between points in Canada in accordance with the judgment in the Eastern Rates Case, it is ordered that order 23231 be rescinded; and that said railway companies be granted leave to publish tariffs as permitted by the judgment in the Eastern Rates Case.

Rates on Wood Pulp to Mechanicville.

25262. Aug. 16. Re application of West Virginia Pulp & Paper Co., for an order disallowing rates on pulp wood to Mechanicville published in C.P.R. Tariff, C.R.C. no. E-2847; also for the suspension on behalf of West Virginia Pulp & Paper Co. and New York & Pennsylvania Co. for suspension of Supplement 15, to C.P.R. Tariff, C.R.C. no. E-2847, issued to take effect Sept. 1. Upon reading what has been submitted on behalf of the applicants and upon it appearing that the applicants and the railways have been unable to arrange a settlement, it is ordered that the said Supplement be suspended pending hearing on a date to be fixed by the Board.

Rate on Dessicated Vegetables to Montreal.

General order 168. July 11. Re complaint of the Graham Co., Ltd., of Belleville, Ont., against the rates on dessicated vegetables: Upon reading what is filed in support of the complaint and on behalf of the Canadian Freight Association; and upon the report of the Chief Traffic Officer of the Board, it is ordered that the railway companies west of Montreal carry dessicated vegetables, in carloads, to Montreal for export, at the domestic rates to Montreal, with the additional of a terminal charge at Montreal not to exceed six-tenths of 1c per 100, whenever the said combination is less than the rate of the published tariff.

Grain and Lumber Stopped at Cartier and Sarnia Tunnel for Orders.

The Assistant Chief Commissioner, D'Arcy Scott, gave the following judgments Aug. 2:—I think the C.P.R. had the right to file supplement 11 to C.P.R. Tariff C.R.C. no. W. 2061, naming extra charges at Cartier, and the G.T.R. to file C.R.C. Tariff E. 3300 naming extra charges at Sarnia Tunnel. No previous order of the Board prevented them from filing these tariffs. From the action the Board has already taken with regard to stop-over charges on grain and lumber at Cartier and Sarnia Tunnel, I think the tariffs now in question should not be interfered with. I would advise Mr. Tilston and the two railway companies accordingly. Deputy Chief Commissioner Nantel agree with that judgment.

Commissioner McLean gave the following judgment Aug. 4:—Notwithstanding the powers possessed by the railways to put into force increased tolls, on statutory notice, the Board dealt with the Cartier situation as one where the increase had to be justified before being allowed to become effective. The charge sanctioned under order 24436 was concerned with an extra charge for detention of grain and grain products and was concerned with the conditions at Cartier alone. (XIX Can. Ry. Cas. 263.) Whether the same charges are justifiable or necessary in respect of lumber and because of the detention of that traffic does not appear. Nothing has been adduced to establish either the similarity or identity of conditions in point of detention of the two forms of traffic. There has been no investigation to show either the necessity or the reasonableness of the same charges on lumber at the other points concerned, and the burden of establishing this necessity or reasonableness seems to me, in view of the action in the Cartier case, to be on the railways.

Proposed New Freight Classification.

The Chief Commissioner gave the following judgment July 26: Proof copies of the proposed new Canadian Freight Classification 17 have been received by the Board. Not only do the changes in the classification ratings appear to be radical, but substantial changes are also made in the rules. Owing to the fact that the new classification contemplates a uniform classification for the whole country, and that different classifications have in the past obtained, the effect of the changes, both in the classification and rules, differs in the different districts, with the result that what would be a restriction of the mixing privileges in one means a more extended right to mix carload lots in the other. It is extremely difficult as the matter now stands for the Board; and it would seem to be impossible for the shippers to properly consider the effect of the new rules and the new classification without definite information as to all the changes sought, the injustice or difficulty suffered under the former regulations, and, speaking generally, the effect of the changes. This information the railways either have or should have. An order should go directing the railway companies to file with the Board and serve on the parties a statement showing, in the first instance, all changes made in the rules and the grounds on which the changes are sought to be justified, and showing the results the changes would make on traffic in Eastern and Western Canada respectively.

General order 169 was passed accordingly, July 27.

The Canadian Northern Ry. is building 2 car floats at Port Mann, B.C., for conveying freight cars across Patricia Bay, until the large car ferry which it has decided to build, is ready for service. They were designed by A. Angstrom, Naval Architect, C.N.R., Toronto, and will be 158 ft. long over all, 46 ft. beam over plating, and 48 ft. over wales, and 11½ ft. deep. They will each take 8 large size freight cars. The first one was launched in July. The C.N.R. has bought two whaling steamships, the s.s. Germania and a sister vessel, formerly owned by Canadian Northern Pacific Fisheries, Ltd., which are being changed to make them suitable for towing purposes, and which are to be renamed Chilliwack and Sumas.

Increase of Wages for C.P.R. Western Shop Employees.

It was announced in Winnipeg, Aug. 10, that a new schedule of wages for employees of C.P.R. shops on the western lines had been signed. Negotiations had been in progress for a couple of months between the company's representatives and representatives of the federated trades. The new agreement is to run to April 30, 1917, when it may be renewed.

The average increase in wages runs between 2 and 2½c an hour for all trades, the largest being a 3c increase for tubers in the boiler shops. This increase applies all along the line from Fort William to the coast, which comprises three divisions, one from Fort William to Broadview; the second from Broadview to Kamloops, and the third from Kamloops to Vancouver.

The rates in the first division in which the Weston (Winnipeg) shops are included, and third division are practically identical, while in the second division they are 2c higher, which is accounted for by the higher cost of living in that territory.

Machinists—	Old Rate	New Rate	Increase
Eastern	45½c	48c	2½c
Central	48	50	2
Western	46½	49	2½
Boilermakers—			
1st Class—			
Eastern	46½	48	1½
Central	48½	48	1½
Western	47½	49	1½
2nd Class—			
Eastern	43	45	2
Central	43	45	2
Western	44	46	2
Tubers, Ashpanmen, Gratemmen, etc.—			
Eastern	35c	38c	3c
Central	37	40	3
Western	34	37	3
Blacksmiths—			
Eastern	45	47½	2½
Central	47	49½	2½
Western	46	48½	2½
Specialists—			
Nine different trades increase 2½c per hour.			
Balance increase 2c per hour.			
Helpers—			
Increase 2c per hour.			
Sheet Metal Workers—			
Winnipeg	39c	41½c	2½c
Garden	(New Rate)	43½	
Tinsmiths—			
Eastern	37c	39c	2c
Central	39	41	2
Western	38	40	2
Moulders—			
Eastern	42	42½	2½
Central	44	46½	2½
Patternmakers—			
Eastern	44	46½	2½
Central	46	48½	2½
Pipefitters (coach and local)			
Eastern	37½ to 40½	39 to 42	1½
Central	39½ to 42½	41 to 44	1½
Western	38½ to 41½	40 to 43	1½
Steel Car Repairers—			
Eastern	29½	32½	3
Central	31½	34½	3
Western	30½	33½	3
All other car men—			
Increase 2c an hour.			
Electricians—			
Eastern	40	42	2
Central	42	44	2
Western	41	43	2
Rivet Boys	11	12	1
Apprentices—			
1st year	13	14	1
2nd year	17	18	1
3rd year	20	21	1
4th year	23	24	1
5th year	26	27	1

Several concessions that the men asked for have been granted to govern working conditions, the principal ones being as follows: All hours over those bulletined as working hours in which the men are required to work shall be paid for as overtime, time and a half being granted until midnight and double time after that. This is to cover occasions when the shops are put on short time and a few men are called in for special jobs. In

changing from night to day shift or vice versa, the first day shall be paid for at overtime rates. When working hours are to be reduced the company will give 24 hours notice of such intention and 48 hours notice shall be given to all men to be laid off. This is to give men receiving notice time to make inquiries as to the reason for such notice.

In all the agreement covers 13 articles, including craft rules, which are set out in great detail so as to avoid friction as far as possible between the men and officials in departmental work.

The Late A. B. Stickney.

Alpheus Beede Stickney, who was the first General Superintendent of the C.P.R. at Winnipeg, appointed on the organization of the company in 1881, died at his home in St. Paul, Minn., Aug. 9, after an illness of four weeks. He had been in declining health for several years. He was born at Wilton, Me., June 27, 1840, lived on a farm in Vermont with his parents, attending a village school until he was 18 years old, and then took up the study of law in Dexter, Me. He was compelled to give up for lack of money and became a country school teacher until he had saved enough money to return to study law. He was admitted to the bar in 1862. He moved to Minnesota, practising law there until 1869, when he took up his residence in St. Paul.

This was at a time when railway building was in its early beginnings in the Northwest, and his law practice turned in the direction of railway matters. He soon gave up his practice and engaged in organizing, first, construction companies, and later railways. His first large undertaking was the St. Paul, Stillwater & Taylor Fall Ry., which he served for several years as Vice President, General Manager, and Chief Counsel. He later superintended the construction of a portion of the St. Paul, Minneapolis & Manitoba Railroad. On the organization of the C.P.R. in 1881 he was appointed its first General Superintendent at Winnipeg, arriving there Feb. 28 and continuing until the end of 1881 when he was succeeded by W. C. Van Horne, who was given the title of General Manager.

In 1882 he became Vice President of the Minneapolis & St. Louis Rd. In 1884 he began the construction of the Minnesota & Northwestern Rd., which afterwards developed into the Great Western. He was President of this road until its consolidation with the Chicago, St. Paul & Kansas City, and then became President of the latter road. He held that office until 1892 when he became Chairman of the Board of Directors. In that capacity he reorganized the company as the Chicago Great Western Railway and continued to serve as Chairman until 1900. His next connection with the road was in 1908 and 1909, when he became its receiver.

During his railway career he acquired extensive outside interests, one of the chief of which was the St. Paul Union Stockyards and packing houses, which he built in 1882.

In 1909 he charged that the practice of rebating had been resumed by many railways under such subterfuges as that of allowing large claims for overcharges and damages presented by favorite shippers. His charges resulted in an investigation by the Interstate Commerce Commission, before which he laid a plan for revising the late laws to make such practices impossible. Since 1909 he has been living in retirement.

Electric Railway Department

Detroit's Interurban Electric Railway Service.

By A. D. B. Van Zandt, Publicity Agent, Detroit United Lines.

Appreciative of the many benefits that come to them by reason of the operation of interurban cars for passenger and freight purposes, the people of Detroit and the other territory served by the Detroit United Lines cannot understand the philosophy of opposition to such an undertaking in any progressive community. It is equally certain that any serious suggestion to put an end to such service into and out of Michigan's metropolis would meet with the vigorous protests of our patrons, both freight and passenger. I had, some few years ago, the pleasure of discussing in the American Academy of Political and Social Science Annals the presentation of interurban problems to the public, in which I pointed out as follows: "While the interurban railway builder and operator has been learning his lesson of cost, the benefits to the public served have grown apace. In the great interurban railway centres like Indianapolis, Toledo, Cleveland, and Detroit, the people, through the constant use of the country trolley for business and pleasure, have gained a better understanding of farm life. These men of the city do not look upon the farmer as the joke 'Hey, Rube,' but as the man who feeds us all. They do not look with pitying glances on the man with the hoe, but, rather, are envious of the man who with the modern machinery at his command has, as it were, but to press the button and watch the land come to life with the fruits of the soil. The farm is not the thing the city man wants to shun; it is the reverse, for deep in his heart is the hope that some day he, too, will be able to retire to his own acre of peace and plenty.

"Similarly those of the farm and village have been brought into close and kindly touch with the city. They know the stores, they know the parks, they are even not unacquainted with the latest play. The farmer is no longer obliged to spend two or three days of his own time and that of his team in the task of marketing his produce at a price unknown until delivery is made, but today, through the agency of the interurban trolley, that makes possible an extensive system of rural delivery of mail, he gets his daily newspaper, knows early the price he can get for his product, places it on an interurban express car, follows by passenger car, and in as many hours as formerly took days he makes his sales and his purchases.

"Much of the opposition to the interurban railway has come from the village under the belief that a frequent service would spell mercantile ruin and here and there this opposition still exists. I quote from a recent edition of the Birmingham, Mich., Eccentric to show the change: 'When the trolley was first established it was claimed it would ruin the smaller towns; the reverse is true. Look over the following census figures and you will note that every town in Oakland not reached by an electric road has been steadily on the toboggan for the past 20 years. On the other hand towns having an hourly service or less have held their own or shown only a slight increase, while the section served by the

Pontiac line, with its 30 and 20 minute service, has absorbed more than the actual net increase in the country.'

The truth is, the interurban line is not a deterrent, but an aid to the small town. It does not of necessity cause all towns to become manufacturing centres, but it does give them better facilities to become such. The interurban line modernizes the trading post, giving the country merchant the same ease in making his purchases as has the corner store keeper in the city, and the same privilege of making these purchases as he wants them and in the quantity he wants. There is no longer the necessity of stocking up for the winter because of impassable road conditions. Today the interurban grocery delivers to its customers strawberries just as early in the season as does the city grocery."

That tells the story in brief. To know that last year our interurban cars, inclusive of city service travel in some of the smaller cities, carried practically 30,000,000 day passengers is to know that the service is filling a great need. Growing from a humble and hazardous beginning we are today operating into and out of Detroit more than 600 interurban cars daily, and this is being done with a constantly increasing city service over the same tracks within the corporate limits.

The freight and express end of our interurban business also had its humble start. Historically it is known that the interurban companies did not desire to carry freight. It was forced upon them by the public. Like Topsy, it "just grew." The beginning was with merchants sending out into the country some package to the roadside farmer or to a small village dealer, while a few pounds of butter or some dozens of eggs found their way into the city. All this was through the kindness of the car crews of the passenger cars, a cheery word, a cigar, or occasionally a little farm produce being their remuneration for acting as messenger boys, with the companies not concerned in any way with the transactions.

The custom grew apace, and from time to time parcels became lost, and not infrequently the companies were blamed for this, and asked to make good for the result of their complimentary service. So burdensome did this free, handy, but often unsatisfactory method of delivery become that in defence combination cars were experimentally tried and for a charge packages were picked up en route and delivered direct to house or store adjacent to the tracks.

As I have said, all this was experimental; neither the public nor the operators knew how much of this form of trading was in sight, but as the business continued to grow it became a nuisance to both city and interurban riders—to the city car passengers by reason of holding back the city cars while the interurbans were loading and unloading their packages, while the interurban passenger desired to reach his destination in as short a time as possible and freight operation lengthened instead of shortened the running time.

The city did not wish to stop the transportation of freight, because of the benefits to the people, but neither did it want the streets used as a shipping yard, so the companies were told to get a freight depot, where the work could be done without discommoding the public. This was done, and the council adopted the necessary resolution to make the track connections. At approximately the same time the council adopted a freight regulatory ordinance beginning with this language: "Under and by virtue of the provisions of sec. 6456 of the compiled laws of 1897, consent, permission, and authority is hereby granted street railway companies lawfully operating street railways within the City of Detroit . . . to carry packages, merchandise and other light freight, milk, farm produce and garden truck. . . ."

This was in 1901 and since that time the freight business has developed wonderfully. The central freight depot has been outgrown, and plans are being rapidly completed for a new freight terminal necessitating an investment of a million dollars. In addition to the central depot there are also convenient unloading places in several parts of the city.

Handling express and light freight the equipment at the present time consists of 43 motor cars, 31 trailer box cars, a locomotive and 2 cabooses. There are daily 34 scheduled round trip runs and from 5 to 7 extras almost every day. The receipts last year from this traffic exceeded \$800,000.

Interurban passenger cars are recognized as such, and they operate within the city under the rules and regulations that apply to strictly city cars, though in some of the street railway settlement plans before the people distinction in operation has been made. None of these plans having been adopted, the interurbans continue to operate under the same rates of fare and the same transfer regulations as do the city cars, yet to a very marked degree the purely city riders refrain from using the interurbans, recognizing the real purpose of such cars is to get the people into and out of the city as comfortably and speedily as possible. While operating within the city the fares are collected for the company owning the city lines, and in return the interurban lines receive pay on the car mileage basis for the use of the cars. No money is paid by the interurban cars for the use of the tracks, nor are interurban cars charged with any portion of the maintenance of these city tracks.

In the matter of freight the state law permits of the operation of such cars during the night time into and through cities, towns and villages without local consent, while for day time operation this consent is necessary and has always been gladly given in recognition of the vital importance of the work.

There is no question that the interurban cars have played, and are playing, a highly important part in the development of Detroit. Many miles of track now within the city were constructed under interurban grants and with which the city had to deal only as it extended its corporate limits. These lines, on practically

all the main arteries, made it possible for the community to expand much more rapidly than would otherwise have been possible.

Naturally the interurban lines have had and have today the favorable support of our daily newspapers, which are themselves large users of these cars for the shipment of their editions out to the country and to the cities and towns served by us. So serviceable are these cars that on some of the lines they are used by newspapers for distributing their large Sunday editions. From the beginning of the interurban system our newspapers have seen the benefits of such service into and out of the metropolis. Two quotations of many years ago from one of our leading newspapers will suffice:

The Evening News of Sept. 20, 1895, said: "With the immense amount of street railway construction now going on in Detroit, and numerous trolley lines either finished or projected between Detroit and neighboring towns and villages, it would seem that the wants of the public for rural and suburban transportation were being largely discounted in advance, but the results thus far have gone to show that business increases with the facilities provided for it. . . . But the end is not yet—in fact there seems to be no end to electrical possibilities of affecting the welfare of Detroit and neighboring cities which will be brought into closer connection with the metropolis by means of rapid trolley lines."

On April 5, 1896, reviewing some 15 interurban roads built, building, or projected, the same newspaper said: "The future trade which shows through electric railway lines in and around Detroit marks in the most significant manner the progress of the city towards increasing size and importance. . . . The benefit of these lines, which, in a majority of cases, will run along established highways, cannot be over estimated. They will establish new social and commercial ties between town and country. . . . This work of laying out lots, obtaining franchises and negotiating with many men demands a high order of skill and diplomacy and is entitled to a fair reward and whoever institutes and builds a suburban railroad is entitled to the thanks of Detroit and its citizens. . . ."

Regina Municipal Ry. Earnings, Etc.

Following are statistics for July, compared with July 1915, and the total for seven months ended July 31:—

	1915.	1916.	
	July 1914.	July 1915.	Jan. 1 to July 31, 1916.
Total revenue ..	\$19,070.44	\$15,887.44	\$122,548.43
Expenses ..	14,319.35	15,018.87	114,235.74
Capital charges..	8,022.96	9,137.53	56,160.73
Operating surplus	4,751.09	868.57	8,312.69
Total deficit	3,271.87	8,268.96	47,848.04
Expenses per car power ..	13.34c	14.19c	16.24c
Expenses per car mile without with power	17.49c	18.37c	21.55c
Platform wages per car hour .	72.69c	75.97c	72.76c
Passengers carried	403,286	338,540	2,716,855
Expenses less capital charges, percentage . . .	75.01		
Expenses with capital charges, percentage . . .	117.15		

The Winnipeg City Engineer has been asked by the city council to report on the best means of lessening the noise caused by the operation of the Winnipeg Electric Ry. cars.

Montreal Tramways Company Annual Report.

Following is the report for the year ended June 30, submitted at the annual meeting, Aug. 1:—

Gross earnings	\$6,609,765.15
Operating expenses	3,707,053.04
Net earnings	\$2,902,712.11
From which deduct:—	
City percentage on earnings	\$418,083.90
Interest on bonds and loans	806,721.44
Interest on debenture stock	800,000.00
Taxes	93,600.00
	\$2,118,405.34
Net income	\$784,306.77
Dividends	323,871.25
Surplus	\$460,435.52
Less:—	
Transferred to contingent renewal account	\$275,000.00
War tax (2 years), 1915-16	74,013.17
	\$349,013.17
Transferred to general surplus	\$111,422.35

The gross earnings increased during the year \$84,533.48 or 1.30%, the operating expenses decreased \$6,943.40 or 0.19%, and the net earnings increased \$91,476.88 or 3.25%. The ratio of operating expenses to earnings is 56.08%, compared with 56.92% in 1914-15.

\$313,575.99 has been charged to contingent and renewal account during the year, representing expenditures made for special renewals. \$583,894.20 has been expended in maintenance of properties, plant and equipment, and charged to operating expenses. This amount, together with \$313,575.99 charged to renewal account, makes a total expenditure during the year on the upkeep of the properties of \$897,470.19. During the year there was expended on capital account \$320,872.17. The company under its trust indenture is entitled to issue bonds on its capital expenditure, equal to 75% thereof, and under this provision it is now entitled, when it shall so desire, to have bonds certified to an amount of \$963,485.55. During the year there have been redeemed and cancelled \$163,233.32 of underlying bonds. The amount redeemed to date is \$1,146,746.56.

The gross earnings increased during the latter part of the year, indicating a tendency to an improvement in the business conditions of the city. In connection with the underlying bonds purchased during the year, \$3,387.80, representing the difference between par value and the purchase price, has been credited to the general surplus account. Your directors, acting on the authority of the shareholders, issued 10,000 shares of common stock, which have been allotted to shareholders at par. During the year the company has, at great expense, completed the work of placing its overhead feeder wires in the municipal conduit (where provided) on St. Catherine Street, and is now proceeding with the same work on Bleury St. and Park Ave. The work in connection with the re-arrangement of the system of power distribution is being proceeded with and satisfactory progress has been made during the year. The company has accepted a contract for machining shells, and work in connection therewith is progressing satisfactorily. The property has been maintained in a high state of efficiency and is in excellent condition. Your directors desire to place on record their appreciation of the valuable and faithful services rendered by the officers and employees.

Gross earnings	\$6,609,765.15
Operating expenses	3,707,053.04
Net earnings	\$2,902,712.11

Expenses % earnings	56.08
Passengers carried	156,408,303
Car earnings per passenger	4.12c.
Transfers	55,512,897
Total passengers carried	211,951,200
Car earnings per passenger, total carried	3.04c.

Cost of road and equipment to June 30, 1915	\$37,222,513.92
New construction for the year	320,872.17
	\$37,543,386.09
Accounts receivable	\$459,592.66
Stores	436,684.26
Cash in bank and on hand	247,564.25
Underlying securities redemption fund	3,643.24
	1,147,484.41
Investments	318,887.50
	\$39,009,758.00

Capital stock	\$4,000,000.00
Less unpaid and subject to call	656,400.00
	\$3,343,600.00
Debtenture stock	\$16,000,000.00
First and refunding mortgage 5% gold bonds	13,335,000.00
Underlying bonds	3,273,253.44
Mortgages	16,863.00
	\$5,988,716.44
Accounts and wages payable	\$461,238.91
Accrued interest	230,872.00
Accrued tax on earnings	315,628.85
Employees' securities	20,965.58
Unclaimed dividends	1,956.57
Unredeemed tickets	237,214.71
Suspense	95,262.75
War tax (2 years)	74,013.17
Dividend payable Aug. 1	83,590.00
	1,520,742.54
Capital reserve	\$600,000.00
Contingent renewal reserve	111,323.22
Surplus	\$775,588.00
Discount on underlying bonds	3,387.80
	778,975.80
	1,520,299.02
	\$39,009,758.00

*This includes amount due on shares not yet exchanged.

The directors were re-elected for the current year, as follows:—E. A. Robert, President; J. W. McConnel, Vice President; F. H. Wilson, Hon. J. M. Wilson, W. C. Finley, J. M. McIntyre, G. G. Foster, K.C., W. G. Ross, Montreal, and P. J. McIntosh, New York.

A Hamilton, Ont., coroner's jury returned the following verdict, recently:—"We find that Clarence Wilson came to his death on July 8 while riding on a street car on Burlington St. E., which was taking a crossover switch at an excessive rate of speed. The motorman had not been informed of the crossover, and we find that the company was negligent in that he was not so informed. We recommend that in future flagmen be located at all crossover switches." The evidence showed that the order as to the crossover switches was posted in the company's office where the motorman should have seen it.

The Calgary, Alta., Municipal Ry.'s extension to the Sarcee military camp, according to a statement reported to have been made by Superintendent McCauley, has practically been paid for out of earnings. The receipts for freight alone during July are reported to have been \$1,700. Ten freight cars a day are operated, and about 50 passenger cars a day are run to and from the camp. The cost of labor on construction was about \$4,000, and the whole cost of the line did not exceed \$15,000. When the camp is abandoned the track and overhead material can be used elsewhere.

The Toronto Suburban Railway's Change of Gauge and Grade in Toronto.

The Ontario Railway and Municipal Board has given judgment on the Toronto Suburban Ry. Co.'s application for approval of its proposed change of gauge, change of grade where necessary, and renewal or tracks where necessary, within Toronto city limits, the following being a summary.—This is an application for approval of two plans, A and B respectively, A showing the company's tracks along Dundas St. from Lambton Mills through York Tp. and the City of Toronto to Keele St., with a spur southerly along Gilmour and Fairview Aves., also from Dundas St. northerly along Keele St. and the Weston Road south to the city limits, also extending easterly from Keele St. along St. Clair Ave. and Davenport Road to Bathurst St. and southerly along Bathurst St. to the C.P.R. It is proposed to change the gauge of the tracks from 4 ft. 10 $\frac{1}{4}$ ins. to standard, 4 ft. 8 $\frac{1}{2}$ ins. Plan B shows the tracks easterly along Dundas St. from the city limits at Runymede Road to Keele St. and northerly along Keele St. to the C.P.R. It is proposed to substitute girder rail for the T rail at present in use. While this is being done, permission is asked to lay and operate along portions of Keele St. and Dundas St. a temporary track. It is also asked that the City of Toronto contemporaneously repair and reconstruct the railway portion of the roadways covered by the agreement of Nov. 11, 1899, made with the town of Toronto Junction, now part of Toronto, which roadways include Dundas St. from the city limits easterly to Keele St., and northerly on Keele St. to the C.P.R.

The Board was advised that the City Engineer had no objection to the proposed change of rail and implied that the council's consent would be forthcoming. He also consented to the laying down of the proposed temporary track. York Tp. does not object, and the City of Toronto does not press its objection to the proposed change of gauge, and indeed objection from either quarter would be purely vexatious in view of the plain provisions of the agreement before mentioned. So far as York Tp. is concerned, there is complete concurrence with the company's proposals, but at this point the concurrence of the city ceases, and differences arise as to its rights and obligations under the agreement. The company alleges that the pavement along Dundas and Keele Sts., which will be torn up in making the changes, is worn out, and should under the agreement be replaced at the city's expense, as the city agreed to "construct, reconstruct and maintain in repair the street railway portion of the roadways traversed by the railway system." The city replies that the work must be done at the company's expense under a clause in the agreement providing that "in the event of the company desiring to make any repairs or alterations in the ties, stringers, rails, turnouts or curves in paved streets, the portion of the roadway torn up in so doing shall be repaved by the corporation but at the expense of the company."

Another question arises on the construction of the agreement, as to the incidence of the cost of the concrete base under the tracks, the company claiming that its cost, as coming under the description of substructure, is not properly chargeable to the company, or in the alternative, only the cost of the increased depth of concrete (6 ins. additional to the normal 9 ins.) necessitated by the tracks

should be charged to the company. The agreement places upon the corporation the burden of construction and repair of the street railway portion of the railway, and expressly excludes the tracks, substructure and superstructure required for the railway; it also places upon the company the duty of constructing the tracks and substructure from time to time, and the Board takes this to mean, both the initial construction and the maintenance in repair of the tracks and substructure. The agreement also declares that in the event of a paved street being torn up by the company for any of the purposes mentioned, the cost of repaving shall be paid by the company.

Dealing with the question of the incidence of cost of constructing the concrete base, it was found on examination by the Board's engineer, that the concrete base was in good, or fairly good condition, so that it follows, that if the company in tearing up the roadway injures or destroys the existing concrete base, it may be made good as a detail of the repairing by the corporation, but at the company's expense. As to portions of the streets in question which are now paved with tarvia, without concrete base, the corporation stated that it was the intention to lay a permanent pavement the width of the track allowance, which will require a concrete base. The plans submitted show a concrete base laid on the sub-base, 15 ins. thick, in which the wooden ties are embedded in such a way that the tops of the ties are flush with the upper surface of the concrete base, thus offering an even bearing on which the steel rails are laid. The pavement is then completed by laying blocks of granite or other suitable material, bringing the travelled surface flush with the top of the rail. A difference has arisen as to which of the parties shall bear the expense of laying the concrete base. The Board reached the opinion that the word substructure as used in the agreement includes the entire body of concrete which carries the rails. The company may take the ground, after conceding that the entire concrete base is substructure, that a different rule is applicable in the present case, holding that the company's obligation at the most is the replacement of the pavement destroyed by one of the same kind now used. The agreement, however, provides that work of this nature is to be done under the supervision of the City Engineer and to his reasonable satisfaction, and the city has sufficiently indicated that only a concrete base as shown in the plans will secure that reasonable satisfaction.

On the question of the corporation's maintenance of the pavement in repair, the city offered to pay the whole cost of paving that portion of Dundas St. now laid with tarvia, and of paving the remaining portion of Dundas St. and the portion of Keele St. in question, less such a sum as the Board might fix on the advice of its engineer, as representing the life of the pavement on those streets, which sum should be paid by the company, this pavement, as proposed by the city, to include the body of the roadway from the base to the top of the rails within the track allowance as already defined. This proposal was made on the understanding that any order based on it should not be made the subject of an appeal by the company, and in case of such appeal, the corporation would be free from any assumption of liability on its account. The Board accepted the pro-

posal with the reservation, and as in the absence of such a proposal, the Board would have felt constrained to hold the company liable for the whole expense of renewing the pavement torn up by it, there is no injustice to the company in adopting the proposal and making it a term of the Board's order.

Some discussion arose as to the change of site of the tracks on Dundas St., which is at present in the centre of the street, and the corporation desires that in the reconstruction proposed, the track should be laid a little off the centre of the street, so as to permit of the laying of another and parallel track when it becomes necessary to operate a double track railway. The city held that it could, under the agreement, require a relocation of the track in connection with the proposed reconstruction, but the Board could not adopt that view, as the location of the track on these streets referred to is the location when the undertaking was initiated, and the company has acquired a vested right in the site, which cannot be disturbed during the continuance of the charter, unless by forfeiture under some applicable provision of the agreement. Any change in location must be the subject of negotiation and agreement by the parties concerned.

The plans submitted will be approved and an order issued in accordance with the foregoing opinions. No question has been raised that the installation of the diamond and safety device at the intersection of the company's line with the Toronto Civic Ry. at the corner of Davenport Road and Lansdowne Ave., already ordered by the Board, should be done contemporaneously with the foregoing works, but as the interests of the parties will be best served thereby, the Board will so order. There will be no costs to either party but the company will pay \$30 for law stamps on the order.

Jitney Traffic Notes.

The Vancouver, B.C., City Council has put on a special motor cycle constable to look after jitney traffic.

A jitney service is being operated in Brantford, Ont., to the Terrace Hill district and residents are quoting its success as a reason why the municipal electric railway should be extended.

The Intermunicipal Industries Committee, representing South Vancouver and adjacent B.C. municipalities, is discussing the jitney question in detail, with a view to united action by suburban municipalities.

The Vancouver City Council has decided to examine all bonds offered by jitney owners, which have been rejected, and to investigate the standing of the companies offering them, and then to accept such as are satisfactory. The license inspector will be directed to thereafter prosecute all jitney men who have not registered bonds.

The Winnipeg Jitney Owners' and Drivers' Association has elected the following officers: J. Wilson, president; J. R. Wilding, vice president; J. Lamarre, secretary-treasurer. The members passed a resolution promising to make the jitney service in Winnipeg the best in Canada, and inviting the public to make suggestions which would tend to its improvement.

Lavatory Accommodation on Hamilton, Grimsby and Beamsville Electric Railway.

The Judicial Committee of the Privy Council has dismissed the Hamilton, Grimsby & Beamsville Electric Ry. Co.'s appeal against the decision of Appellate Division of the Ontario High Court of Judicature, confirming the Ontario Railway and Municipal Board's order whereby the company was directed to file complete plans and specifications for sanitary conveniences on its passenger cars and in its passenger station at Grimsby.

On Dec. 11, 1914, the Board dealt with a complaint by four residents of Grimsby relating to the lack of the accommodation mentioned, and after hearing evidence ordered that the plans and specifications named be filed within 30 days. The company appealed against this decision on the ground that the Ontario Railway and Municipal Board had no jurisdiction in the matter as the company's railway was, according to the Railway Act of 1888, sec. 306, under Dominion jurisdiction.

The appeal was heard Nov. 9, and unanimously dismissed with costs, the Board's order being confirmed, that is, the company's contention as to being under Dominion jurisdiction was not upheld. The appeal to the Privy Council followed, and the present judgment confirms the Ontario Court's judgment and the Board's original order.

This decision is of considerable importance, as it settles the question of jurisdiction which, owing to ambiguity in the Act, has caused considerable friction for many years. The reasons for the Privy Council's judgment have not reached us at the time of writing, but the Ontario Railway and Municipal Board's full judgment was given in Canadian Railway and Marine World for June, 1915. The issue for August, 1915, published the report of the Board of Railway Commissioners' expert in connection with the provision of lavatory accommodation on interurban and suburban cars, and comments of several companies thereon.

The Hamilton, Grimsby & Beamsville Electric Ry., which is a constituent of the Dominion Power & Transmission Co., has an extreme distance between terminals of 22.6 miles, practically all on, or along, the public highway and for a large portion of the way in front of residences and over city and village streets. Many objections to the use of car lavatories have been made by residents along the line. The company provides lavatory accommodation at Hamilton, Bartonville, Grimsby and Beamsville stations.

Sandwich, Windsor & Amherstburg Ry's Difficulties in Walkerville.

For a considerable time past there has been much friction between the town of Walkerville, Ont., and the Sandwich, Windsor & Amherstburg Ry., with respect to the service given. One of the matters in dispute has been the paving of the streets between the tracks, on such of the streets as are now unpaved, and it appears that the council has called upon the company to have this work done, but no steps have apparently been taken to comply with the direction. A second matter has arisen, viz., a direction by the council that the cars should stop at the near side of the street instead of the far side, as at present, and as is the case in Windsor.

There are other matters about which there is a difference, which has resulted in an endeavor being made to start a motor bus service in the town as a municipal enterprise. In reference to the latter, the council has prepared a bylaw to provide \$15,000 to equip a motor bus service, which is to be voted on by the ratepayers Sept. 2. In order to demonstrate what could be accomplished by such a service two cars of different makes were operated in the town from July 27 to 31, inclusive. The cars ran on a 15 minute schedule, cutting a figure eight through the town, running in opposite directions over a total distance of 5½ miles. No fares were charged during the demonstrations. They operated from 11 a.m. to 11 p.m. The two cars averaged about 80 passengers per round trip. The bylaw provides for the expenditure of \$15,000 to equip the service, and the municipal authorities claim that the revenue from the service will pay operating expenses, and provide a fund for extending the service.

The matter as to the stopping of the cars on the near side of the streets has reached the courts. On July 30, orders were given to the company by the council to have its cars stop at the near instead of the far side of street crossings in the town, and the Mayor is reported to have stated that unless the order was complied with, as well as the previous order respecting the paving between tracks on unpaved streets, steps would be taken to have the company ordered off the streets entirely. As the cars did not make the stop as required, but continued to stop at the far side of the crossings, the Mayor and officers of the council proceeded Aug. 1 to stop the cars running, and succeeded in holding up the traffic for some hours. On Aug. 2 the company obtained an interim injunction restraining the Mayor and Town Council from interfering in any way with the operation of the cars in the town, the allegation being that the Mayor "without color of right did impede the traffic to the annoyance and discomfort of passengers." The case was set down for argument in Toronto Aug. 10, but was adjourned, the interim injunction being continued.

Jas. Anderson, General Manager, is reported to have said Aug. 2: "We are quite willing to have the cars stop at the near side on paved streets, but changes like that cannot be put into effect abruptly. We have the comfort of the passengers to consider and if cars are stopped on the near side in Walkerville, in some places passengers would be forced to wade through mud on rainy days, as no crossing provision has as yet been made for them on that side of the street. The stopping of the street cars on Tuesday was a high-handed piece of work and the passengers on the cars held up and those who waited for hours for a car were the principal sufferers."

A circular was issued by the company Aug. 3, stating that the stops would be made on the near side of the streets on and after Aug. 5.

The Winnipeg Electric Ry., during August entertained several thousands of the children of the city under 12 years of age. The first of the excursions took place Aug. 1, when 10 carloads of children were collected in the north end of the city, taken to Assiniboine Park, and there given an afternoon's enjoyment, finishing up with refreshments and the return ride home. It was estimated that about 10,000 children would be thus entertained by the end of the month.

The Sudbury-Copper Cliff Suburban Electric Railway.

The construction of this railway was commenced July 12, 1915, and it was partly opened for traffic Nov. 11, 1915. The line extends from Sudbury, Ont., at Ramsay Lake, following John, Station, Durham, Cedar, Lisgar and Elm Streets, the last mentioned being the main street, to the outskirts of the town, and thence along the highway by the C.P.R., Sault Ste. Marie Branch, and the Canadian Copper Co.'s property, to Copper Cliff, 6.27 miles. In Sudbury, 0.73 mile of the line has been laid in a 6 in. cement base with vitrified brick on the bitulithic pavement built by the town. The line is laid with 80 lb. T rail on cedar ties at 20 in. centres. Three inch gravel ballast is used and the rails are electrically bonded. The maximum grade is 3¼% with practically no curvature outside the towns. There are no bridges and only three timber pile culverts of 15 ft. span. The line crosses the C.P.R. main line on Elm St., on the level, where two solid manganese steel diamonds have been inserted in the track, and gates and interlocking plant installed. The overhead construction in the towns is carried on tubular steel poles with cross spans, and in the country, on wooden poles with brackets. The trolley wire is 4-0 copper, and 600 volt d.c. power is used, being obtained from the Wanapitei Power Co. at 2,300 volt, 3 phase, 60 cycle a.c. The motor generator set at Ramsay Lake consists of one m.p.c. 6 300 k-720 r.p.m. 550/600 volt compound wound d.c. generator, 3 panel switchboard. The company operates three double truck cars, each with seating capacity for 50 persons. The cars are equipped with 4-80 G. E. motors, K6 controllers and Westinghouse air brakes, and are 42 ft. long, weighing about 22 tons.

A half hour service between Sudbury and Copper Cliff is given from 6 a.m. to 12.30 a.m., and a local car runs from Elm St. crossing to Ramsay Lake every 20 minutes. The Ramsay Lake & Copper Cliff fare is 15c. and tickets are sold at 8 for \$1. Workmen's tickets are sold in books of 60 for \$4.50, good on all cars at all times. The buildings on the line comprise the Copper Cliff station, 18 x 30 ft., and the car barn, with 2 tracks, 40 x 120 ft.

The directors of the company are, President, J. J. Mackey; Vice President, J. H. Morin; Secretary, M. J. Powell; Treasurer and Managing Director, L. O'Connor; and L. Laforest, C. McCrea, M.L.A., and T. E. Smith.

The Buzzer is the name selected for the bulletin being issued by the British Columbia Electric Ry., as a means of communication between the company and the public. Prizes were offered for suggestions and the winning name was sent in by 11 persons, who each received \$2. Nine persons each received \$1.50 for the suggestion Current Comments, and four persons each received \$1.25 for Between the Lines. W. G. Murrin, General Superintendent, selected the name, from 5,041 sent in.

British Columbia Electric Ry. Employees and the War.—Since the commencement of the war in Aug. 1914, 368 employees of the B. C. Electric Ry., and 80 employees of the Western Canada Power Co., have enlisted. Those who return from the front are reinstated as far as possible, and their applications for re-employment receive preference over all others.

Electric Railway Projects, Construction, Betterments, Etc.

Brantford Municipal Ry.—The residents of the Terrace Hill district have applied to the Brantford City Council to authorize the extension of the electric railway into that district. This extension was promised some years ago by the old company, but was postponed to permit of the building of the Holmedale extension. (May, pg. 200.)

British Columbia Electric Ry.—The New Westminster, B.C., City Council is regrading certain streets one of which is Sixth St., but has not come to an agreement with the B. C. E. Ry. respecting the cost of lowering that company's tracks at the street intersections at the corner of Sixth St. and Fourth Ave. The company claims the line is being operated at a loss, and that it should not be called upon to lower its tracks seeing that the work is to be done purely for the city's benefit.

The first part of the company's freight sheds at the New Westminster water front has been completed and the staff have moved into it. The old shed is to be torn down. It has not yet been decided when the second and final unit of the shed will be built. (June, pg. 242.)

Calgary Municipal Ry.—A proposition to extend the Sarcee military camp line for half a mile has not been approved by the Board of Commissioners. The following letter from T. H. McCauley, Superintendent, was subsequently received by the Commissioners: "As the city does not feel disposed to construct the half-mile loop to the guardhouse at Sarcee, the feeling being that it is too late in the season, I beg to submit to you the following proposition, as a guarantee of my confidence in the proposition, which was recommended for the convenience of the soldiers: I will construct the line immediately at my own expense, turn the operation over to the Returned Veterans' association, accepting 75% of the net profit over all operating expenses, they to receive as a contribution to the fund 25% until the 75% repays me for the cost of the line. After I have received the cost of the line I will then accept 50%, donating 50% to the Returned Veterans' association or club, all subject to the city having the right to take over the line at any time at cost, provided the city loans the extension 2 motors, 2 pairs of wheels and fittings from surplus stock on hand, and supplies power free, representing \$2 a day. There would be one fare charged on this and it would have no connection with the present system. This offer is made on behalf of the returned veterans and the soldiers at Sarcee, and considering the liability I am assuming I believe the city should grant the concessions asked, as it would be a feeder to the present line by permitting the soldiers transportation between these points, which they now have to walk, regardless of weather conditions."

Edmonton Radial Ry.—The Board of Railway Commissioners has authorized the Edmonton, Alta., City Council to build its electric railway across the Grand Trunk Pacific Ry. at the intersection of 27th St., between Armstrong and Cochrane Avenues, under the supervision of the G.T.P.R. engineer; and to insert a drawout there, the same to be protected by a half interlocking plant. The question of the maintenance of this plant is reserved for further consideration. (Jan., pg. 30.)

Hamilton, Grimsby and Beamsville Electric Ry.—At a special meeting of the Lincoln County Council, Aug. 11, F. H. Keefer, K.C., Thorold, Ont., was appointed as arbitrator between the county and company in connection with the request for the use of the Queenston and Grimsby shore road, the company's franchise over which expired in February. The county demands \$100 a mile through the townships of Clinton and North Grimsby, and \$400 a mile through the villages of Grimsby and Beamsville, on a 10-year franchise, but the company does not wish to pay this amount. The Ontario Railway and Municipal Board was unable to act as arbitrators in the dispute.

Lake Erie & Northern Ry.—The Brantford, Ont., City Council granted a permit, Aug. 11, for the erection of the new Union station, an illustrated description of which appeared in our June issue, pg. 240. The estimated cost of the building is \$25,000, the contractors being Schultz Bros., Limited. The work of putting in the foundations has been in progress for some time. The permit was issued subject to the company carrying out the Board of Railway Commissioners' award in reference to the transfer of certain lands to the city by the company. The station is to be used by the Hamilton and Brantford Ry. as well as by the L. E. & N. R.

The regular operation of trains on the line into Port Dover by electric power was started Aug. 1. At a meeting of the Port Dover Council, July 31, plans were approved for the bringing of the railway into the town by St. Patrick St. down to a point opposite the park, instead of the proposal of having a Union Station with the G.T.R.. The proposition is being discussed with the company. (Aug., pg. 338.)

London & Port Stanley Ry.—A press report states that plans are under consideration for making the line a double track one. This work and the necessary additional equipment is estimated to cost \$500,000. (Aug., pg. 338.)

London & Lake Erie Ry. and Transportation Co.—A press report of Aug. 16 stated that Canadian Northern Ry. officials were inspecting the company's terminals at London and Port Stanley, in connection with a proposal to take over the line. Another report says that while there are negotiations with the C.N.R., both the London St. Ry. Co. and the London Railway Commission operating the London & Port Stanley Ry. are considering the possibility of acquiring the line.

London St. Ry.—A bylaw approving of the arrangement between the city council and the company has been passed. The bylaw grants the company the privilege of operating its cars on Sundays, for one year, and the company agrees to double track the Dundas St. line, to extend the Hamilton Road line to West St., and to make other improvements. The double tracking and the extension are to be counted as new lines within the meaning of the agreement between the parties on the population requirements of the city. The additional works to be done include some pavements, but no other new pavement work is to be asked for this year. (July, pg. 299.)

Montreal Tramways Co.—A dividend of 2½% for the quarter ended June 30 was passed Aug. 1.

Ontario Hydro Electric Railways.—At an executive meeting of the Ontario Toronto, July 25, Sir Adam Beck, Chairman of the Hydro Electric Power Commission of Ontario, is reported to have said that Sir Robert Borden and three other Dominion Cabinet Ministers had assured him that the Dominion would subsidize at the rate of \$3,500 a mile, radial electric railways to be built in Ontario under the Commission's direction, provided that the province would give a similar subsidy.

The Ontario Government has passed an order in council authorizing the Hydro Electric Power Commission of Ontario to buy a right of way for a power transmission line from Toronto to Dundas. It will be 100 ft. wide, so as to be available for an electric railway also.

Saskatoon Municipal Ry.—Tenders are under consideration by the Saskatoon, Sask., City Council for the laying of 1,200 ft. of new double track on the provincial bridge at 25th St., the work to be done in conjunction with the paving of the bridge by the Saskatchewan Government, for which tenders are also under consideration. (Aug., pg. 338.)

The Sudbury-Copper Cliff Electric Ry. is considering the question of building two extensions, one from the Sudbury flour mill, which is the present eastern terminus of the line, to the Murray nickel mine, about 4 miles; the other to also start from the Sudbury flour mill and run to the Mond Nickel Co.'s plant at Coniston, about 19 miles. These proposed extensions are said to be principally for the purpose of facilitating accommodation for the employees of different mines so as to make it possible for them to live in Sudbury.

Winnipeg Electric Ry.—It was expected that the double track line from the northern terminus of the city lines to Kildonan Park would be completed and in operation by Aug. 31. The transfer point at the terminus of the city lines will still be maintained for Kildonan Park cars after the double tracking has been finished. Under an order of the Public Utilities Commissioner made about a year ago strip tickets of 4 are now sold on street cars to Kildonan Park for 25c. (Aug., pg. 338.)

Mainly About Electric Railway People.

R. F. Rankine, formerly Treasurer, International Ry., Buffalo, N.Y., died at Niagara Falls, N.Y., recently, aged 54.

Patrick Dubee, Secretary - Treasurer, Montreal Tramways Co., has completed 26 years service with this company and its predecessors.

E. R. Wood, President, Dominion Securities Corporation, Toronto, and a director, Canadian Northern Ry., has been elected President, Buffalo, Lockport & Rochester Ry.

L. McCutcheon, chief clerk to General Freight and Passenger Agent, British Columbia Electric Ry., has resigned to enter Canadian Northern Ry. service.

W. J. Carrique, General Manager Canadian Street Car Advertising Co., died at his summer home at Strathmore, Que., very suddenly, Aug. 14. He was engaged at business in the company's offices at Montreal all day, but had a hemorrhage

of the stomach after returning home and died in the course of the night. He was born in Halton County, Ont., Aug. 19, 1872, and entered the advertising business, serving as advertising manager of the Hamilton Herald and subsequently of the Ottawa Citizen. He subsequently started the Canadian Street Car Advertising Co., which now controls nearly all the street car advertising in Canada.

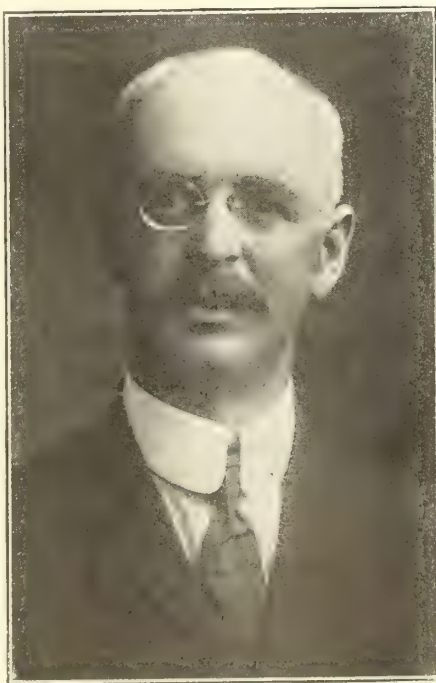
E. P. Coleman, whose election as President, Canadian Electric Railway Association, was announced in our last issue, was born at Taunton, Mass., June 14, 1867, and educated at the public schools there. He was from Feb. 9, 1885, to Feb. 9, 1896, in the Huber Printing Press draughting room at the shops of the Taunton Locomotive Manufacturing Co., with which his father and grandfather had been associated for many years; Jan. 1, 1896, to Sept. 1, 1900, Treasurer and General Manager, Attleboro Steam and Electric Co., Attleboro, Mass.; May 5, 1898, to Mar. 31, 1899, in U. S. service during the Spanish War as Second Lieutenant and Battalion Adjutant, 5th Massachusetts Infantry; July 1, 1899, to Sept. 1, 1900, General Manager, Plymouth Electric Light Co., Plymouth, Mass.; Sept. 1, 1900, to June 1, 1905, Vice President and General Manager, Consolidated Lighting Co., Montpelier, Vt.; June 1, 1905, to Mar. 1, 1907, in practice as consulting engineer, general, electric light, power, railway and quarry work, and Treasurer and Manager, Wetmore and Morse Granite Co., Montpelier, Vt.; Mar. 1, 1907, to Jan. 1, 1909, General Manager, Great Northern Power Co., Duluth, Minn.; Mar. 1, 1909, to Oct. 1912, Manager of Railways, and since Oct. 1912, General Manager, Dominion Power and Transmission Co., Hamilton, Ont. He has been a member of the executive committee of the association for several years, and was Vice President for 1915-16.

The Ontario Government and Hydro Railway Construction.

Some dissatisfaction is apparent among the member municipalities of the Hydro Electric Radial Railway Association, regarding the delay in preparation for the construction of radial electric railways, for which municipalities have already voted and entered into agreements with the Hydro Electric Commission of Ontario, to build. The executive committee of the association communicated with the Ontario Premier on the subject recently as follows:

"Railway Bill 167, of 1916, has one commendable feature in clause 4, in which the municipal corporations are prohibited from selling publicly owned railways, but outside of this and the legalization of agreements as between the municipalities and the Commission, the act seems to have been entirely uncalled for. While we agree with you that under the present conditions of labor and prices of materials it would be impossible actually to construct railways at this time, we believe, from personal investigation, that there could be no better time to purchase rights of way and complete surveys. It would appear to us that the general effect of the above bill and of other legislation enacted at the last session has been completely to paralyze, for the time being, the hydro electric railway programme, thus not only holding up the project temporarily, but completely defeating the wishes of the Ontario municipalities as evidenced by

the tremendous numbers representing these municipalities on the deputation, the enormous majorities piled up in favor of the agreements with the Commission, and the widespread interest and enthusiasm shown on every platform throughout the Province. We would especially call your attention at this time to the many resolutions, memorials and petitions presented to your honorable council during the last two or three years, asking for immediate action in regard to this project. We believe that, while nothing should interfere with the bending of every energy to the successful conclusion of the present war, we should still, at this time, have an eye to the future needs of the Province and prepare for the time when peace is finally concluded. We feel that this can be accomplished in no better way than by the passing of railway bylaws for such lines as the Commission assures us would be profitable, complete the surveys and purchase the rights of



E. P. Coleman
General Manager, Dominion Power and Transmission Co. Ltd., and President, Canadian Electric Railway Association.

way for same so as to be ready to commence construction as soon after the close of the war and the return of our soldiers as may be deemed expedient."

It is held that though the Commission has full power to deal with the matter of right of way purchase, it is necessary for an order in Council to be issued before such matters can be financed, and that the Government has indicated that nothing of this kind will be done until the conclusion of the war. The Attorney General stated Aug. 16, that in his judgment, a section of the act permits the Government to authorize the Commission to purchase right of way and do the necessary financing, but if there is a technical defect regarding the issue of bonds by the Commission, to cover the purchase, it would be easy to remedy it by the issue of a special warrant.

London & Port Stanley Ry. Operating Results, Etc.

Sir Adam Beck, speaking at the Irish Benevolent Society's dinner at Port Stanley on Aug. 16, gave the following comparative figures of the operation of the

London & Port Stanley Ry. for July 1915 and 1916 respectively:

Passenger revenue	\$12,365.95	\$24,000.00
Freight and miscellaneous revenue	11,076.00	17,000.00
Incline railway earnings ..		7,000.00
	\$23,441.95	\$42,700.00
Operating expenses	\$14,659.27	\$18,000.00
Fixed charges	5,340.00	7,000.00
	\$19,999.27	\$25,000.00
Net earnings	\$3,442.68	\$17,700.00
Passengers carried	63,739	165,074

Sir Adam also made the following statements:—The rates of fare in July, 1916, were 22% lower than in July, 1915, and the rate of wages has been increased 12%. The Pere Marquette Rd., during its last year's lease of the L. & P. S. R., carried 132,699 passengers, while the London Railway Commission for the 12 months just closed carried 548,316. At the January elections the people will have to decide whether they will proceed with the recently evolved plan to double track 12 miles of the road, in order that the greater traffic that is constantly coming to it may be accommodated. More equipment, including motor cars and trailers, are also required. The commissioners propose to erect before next summer a large modern bath-house at Port Stanley, out of surplus earnings. Further lavatory accommodation will be provided on the hill, and refreshment booths, under the road's management, will provide for the people at prices that will protect pleasure seekers from being fleeced. Sir Adam is in favor of building a large grain elevator at Port Stanley.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry., and allied companies:—

	June 1916	June 1915	June 30, 1916	June 30, 1915
Gross	\$ 529,078	\$498,093	\$6,602,624	\$7,306,563
Expenses	472,679	494,315	5,748,842	5,994,212
Net	56,399	3,778	853,782	1,312,351

The percentage paid to the City of Vancouver, on the gross earnings there during July, was \$3,473.68, a decrease of \$645.42 as compared with July 1915. The number of passengers carried was 2,242,448X against 2,325,686 in July 1915.

London Street Ry.—

	June 1916	June 1915
Gross	\$40,164.22	\$33,301.11
Expenses	28,335.93	23,473.71
Net	11,828.29	9,827.40

Toronto Ry., Toronto and York Radial Ry., and allied companies.—

	June 1916	June 1915	June 30, 1916	June 30, 1915
Gross	\$884,491	\$787,558	\$5,335,199	\$4,810,063
Expenses	436,635	388,013	2,735,760	2,540,137
Net	447,856	399,545	2,599,439	2,269,926

Toronto Ry.—

	1916	City percentage	1915	City percentage
Jan.	\$473,784	\$68,847	\$471,226	\$70,486
Feb.	470,764	70,614	440,313	66,047
Mar.	518,555	97,237	488,468	93,141
Apr.	496,172	99,234	467,701	93,540
May	500,314	100,063	468,953	93,790
June	467,086	93,417	450,582	90,116
July	469,845	93,969	449,108	89,821

\$3,396,521 \$623,381 \$3,236,351 \$596,941

In accordance with the terms of the trust deed, 79 currency bonds of \$1,000 each, issued under the first mortgage, Sept. 1, 1892, were recently drawn for redemption at par with interest to Aug. 31.

Winnipeg Electric Ry.—

	June 1916	June 1915	June 30, 1916	June 30, 1915
Gross	\$254,686	\$255,549	\$1,701,474	\$1,852,256
Expenses	167,115	170,904	1,070,966	1,130,612
Net	87,571	84,645	630,508	721,644

Answers to Questions on Electric Railway Topics.

Following are some questions sent to the American Electric Railway Association's question box, with replies thereto, contributed by Canadian electric railway officials.

Snow Plough Operations.—An unusually heavy fall of snow during the past winter along our lines (interurban) has brought out forcibly certain defects in our snow fighting methods and apparatus. We are anxious to discover how other companies meet similar situations. (a) How should the mould boards of ploughs be designed so as to lift the snow high enough to throw it over the banks that form on the sides of the track? (b) Should not the frames of trucks on snow ploughs be above the journals instead of below? (c) What is the proper clearance for motors on snow ploughs and how is it possible to give such clearance as will avoid impeding the progress of the plough? (d) Has any substitute been found for the rattan, commonly used in sweepers? (e) How can the bottom of the scoop, surrounding the fan in a rotary plough, be prevented from riding on packed snow and so almost lifting the trucks from the rails and stalling the plough. (f) Can a rotary plough be used with thawing snow? We found under these conditions that the fan was not able to throw out the damp snow and consequently stalled until the snow was shovelled away. (g) Have any member companies used apparatus equivalent to the flangers used by steam railways? If so please describe and give details.

M. W. KIRKWOOD, Superintendent, Galt, Preston & Hespeler St. Ry.—(a) Our experience has been that the nose of a plough should have a long gradual slope so as to lift the snow well up before attempting to throw it, otherwise the snow is merely pushed out. (b) We believe the frame of the truck should be above journal boxes rather than below. (c) The motor should be at least 3 to 4 ins. above the top of rail and we allow the bit of snow plough to go within 1 in. of top of rail. This height is governed by 1 in. renewable wearing shoe attached to the under side of the plough bit and allowed to slide on the rail except at frogs and switches. (d) Our experience has been with rattan only, and we are not familiar with any substitute. (e) Do not allow snow to pack above top of rails. (f) Have not had experience with rotary snow ploughs. (g) We have used a flanger similar to the Ray snow flanger, manufactured by Railway Appliance Co., Chicago, with very satisfactory results.

(Considerable information previously sent in response to these questions, by W. G. Murrin, General Superintendent, British Columbia Electric Ry., Vancouver, was reproduced in our August issue, pg. 334.—EDITOR.)

Designation of "One Man" Cars.—It seems desirable that some other term than "one man cars" be used to designate this class of rolling stock. Have members any suggestions?

A. GABOURY, Superintendent, Montreal Tramways Co.—Would suggest "front end" car, signifying that entrance, exit, payment and employe are at that end. Another suggestion may be "pay front" for one man car, the regular car being known as near side car.

Classification Lamps.—Have any member companies used electrically lighted classification or marker lamps? If so,

are the lamps lighted from the trolley circuit or a storage battery or a combination of both? When electrically lighted markers are used, is it necessary or desirable to carry an oil lamp in addition?

A. GABOURY, Superintendent, Montreal Tramways Co. Have not used electrically lighted lamps, but would consider oil lamps an essential addition for use in emergency.

Car Mileage Registration.—Have any member companies considered the use of a mechanical device, similar to automobile odometers, for the registration of car mileage? Is such a device desirable?

A. GABOURY, Superintendent, Montreal Tramways Co. Have not used considerable instruction of car men so as to ensure cutting out of the car barn or yard mileage, or pull-in mileage. Clerical labor compiling totals would be as great as in present method, or possibly greater.

Code of Conduct for Platform Men.—Have any member companies prepared anything of this kind to supplement the book of rules, or do they think such a book feasible?

A. GABOURY, Superintendent, Montreal Tramways Co.—We issue a little telling them what the company expects of them as regards discipline, personal appearance and courtesy. This is followed up by personal letters to our men's homes, and periodical talks to them in their stations on the same subjects and on their relations to the public as representatives and salesmen of company.

Electric Railway Notes.

The Guelph Radial Railway, which is owned by the City of Guelph, Ont., has advanced conductors' and motormen's wages 1c an hour, making the minimum wage 23c.

The Sandwich, Windsor and Amherstburg Ry. has recently received 2 single end, single truck city cars, each 21 ft. long, similar to those already in service, from the Preston Car and Coach Co.

The Quebec Ry. Light, Heat & Power Co., during the exceedingly warm weather, gave free rides round the city and out of it towards Sillery, to mothers and children from the congested districts of the city.

The Dominion Power and Transmission Co. has recently received 10 single end, double truck city cars, similar to those already in operation on the company's lines in and about Hamilton, from the Preston Car and Coach Co.

Winnipeg, Man., Electric Ry. employes who have been in the service for 10 years and over, held a "special car" picnic to Selkirk, July 27. There are said to be over 300 of these veteran employes.

The Winnipeg Electric Ry. has agreed with the St. Vital Council that for the future one fare only will be collected from any point in the city to the terminus at St. Vital Road, instead of the double fare heretofore charged.

The Port Arthur Electric Ry. is experimenting with a one-man operated car on its Arthur St. run, with a view to its permanent adoption. The problem is to find out how to get the best service, consequently several different plans for routing the car are being tried.

The London and Port Stanley Ry.'s freight traffic is reported to be steadily increasing. An average of 30 cars a day is being handled from the Marquette and Bessemer car ferry landing at Port

Stanley, Ont., and an increasing traffic is being handled from the Michigan Central, Pere Marquette, and Wabash railroads.

Montreal and Toronto people have acquired the controlling interest in the Algiers Ry. and Lighting Co., a subsidiary of the New Orleans, Southern and Grand Isle Ry., Louisiana, U.S. The company's franchise and property was sold under an order of court, the concern being in the hands of a receiver.

The Sarnia, Ont., St. Ry. is arranging a new contract for hydro electric power with the city. It is said that under the new contract, which will be for an increased quantity, the company will pay a higher rate, but there will be a reduction in the amount to be paid for changing plant. Under the existing contract the company was to provide \$20,000 for changing machinery.

Montreal Tramways Mutual Benefit Association.

Following are extracts from the report for the year ended April 30:

SUMMARY OF RELIEF WORK.	
Members disabled through sickness or injury	1,306
Visits made by physicians to disabled members	639
Consultations given by physicians to disabled members	8,301
Prescriptions issued	6,096
Paid for sickness and injury	\$12,548.10
Paid for medicine	1,973.33
Paid for pensions	1,350.00
Paid for withdrawals	668.95
Paid for death and burial insurance	9,233.35

Twenty members died, 1 Mechanical Superintendent, 2 clerks, 1 inspector, 6 conductors, 7 motormen, 1 storage battery attendant, 1 foreman and 1 hillman.

The committee reports the expression of gratitude from the beneficiaries of deceased members for the prompt payment of the death and burial benefits.

During the year 3 members requested to have their benefits commuted, which, was agreed to by the committee.

The committee gratefully acknowledges having received from the Montreal Tramways Co. \$14,255.73, which added to the fees and dues received from the members, viz., \$16,849.50, and the interest received on investments and bank deposits, amounting to \$9,258.37, made a total revenue for the year of \$40,363.60, the expenses being \$35,210.71, leaving a surplus of \$5,152.89.

Montreal Tramways Co's Franchise.

A report upon the recent proposal submitted to the Montreal City Council by E. A. Robert, President Montreal Tramways Co., prepared by city officials was said to be ready for presentation to the Board of Control at the regular meeting, Aug. 21. A bare quorum was present at the meeting, and the report was not brought up. It was decided to ask the company to send representatives to the Board meeting on the following day. On Aug. 22, E. A. Robert, President, and J. L. Perron, Solicitor for the company, were present. When the matter came up it was decided to begin the discussion Aug. 29, and to carry it on every Tuesday and Thursday until completed. \$1,000 was voted for a stenographic report of it. The city's traffic engineer was instructed to produce all plans and reports on the tramway situation made in 1914 and 1915; and all public bodies and private individuals interested in the matter were invited to send in suggestions which might help in reaching a solution.

Marine Department

Dominion Government Dredge for St. Lawrence Ship Channel.

The Marine and Fisheries Department is having constructed a twin screw, self propelling centre ladder, combined hopper and barge loading dredger for service on the St. Lawrence ship channel below Quebec. The principal dimensions are as follows:

Length between perpendiculars	284 ft.
Length overall	292 ft.
Depth moulded	20½ ft.
Mean draft with hoppers full	16½ ft.
Dredging depth	57 ft.
Angle of bucket ladder	45 degrees
Angle of discharge chute	25 degrees
Capacity of hoppers	30,000 cu. ft.
Dredging capacity per hour	1,500 tons
Speed per hour	10 knots

The vessel, which will be the largest of its kind in Canada, will be capable of dredging and discharging into steam hopper barges on either side, or into its own hopper, 1,500 tons of material an hour when working at a depth of 57 ft.

The propelling and dredging machinery will consist of 2 sets of triple expansion, inverted, direct acting, surface condensing engines, each with one high pressure and one low pressure cylinder, working on three cranks and each driving a line of propelling shafting or dredging gear as required, fitted with steam reversing gear and all necessary accessories. The dimensions are as follows:

H. p. cylinders	17 in. dia.
I. p. cylinders	27 in. dia.
L. p. cylinders	43 in. dia.
Stroke	27 in.
Two independent air pumps	
..... 18 in. dia. x 10 in. stroke	
Two vertical single direct acting feed pumps, 9½ in. steam cylinder 7 in. water cylinder, 18 in. stroke.	
Two independent centrifugal circulating pumps..	
..... 7 in. bore	
One duplex bilge pump	6 in.
steam cylinder, 6 in. water cylinder, 6 in. stroke	
Two duplex general service pumps .7 in. steam cylinder, 4½ in. water cylinder, 8 in. stroke	

Two marine cylindrical horizontal single ended boilers will be installed, working at a pressure of 180 lbs. a sq. in., each having 4 furnaces and of the following dimensions:

Diameter inside	15 ft. 6 in.
Length of ends at top	11 ft. 6 in.
Furnaces inside dia.	3 ft. 6 in.
Tubes outside dia.	¾ in.

The furnaces will be of the Morison suspension type.

Each boiler will be fitted with a patent temperature balance. All doors on man-holes will be of patent design. The usual water gauges, steam gauges, salinometer cocks, scum pans, safety valves and zinc slabs are fitted in each boiler. An ash ejector of the latest type will be fitted and worked in connection with the general service pump.

The dredging machinery will be of the most improved design and construction, the gear in the engine room being fitted with 2 speeds working from either propelling engine. All wheels will be of cast steel with double helical teeth machined on points and edges. All gearing shafts will be of the best forged steel with large bearing surfaces and collars to prevent lateral motion. The tumblers will be of cast steel, the top one having 5 sides and the bottom one 6. Patent protection boxes will be fitted to the bottom tumbler shaft and special oil connections installed. The rollers will be of cast iron, chilled on the outside having forged steel spindles covered by manganese steel sleeves. The bucket backs

will be of cast steel specially designed and constructed. The capacities of the 2 sets will be 30 cu. ft. and 54 cu. ft. for clay and soft material respectively. The shells will be of mild steel and the lips for the smaller bucket will have four teeth. The links will be of forged steel made reversible, and hunting links will be supplied of similar design. The bucket pins will be of forged manganese steel, the heads being square and recessed into side of back. The hoisting gear for the bucket ladder will consist of 2 blocks, each having 5 sheaves 5 ft. in diameter and steel wire rope. Two sets of triple purchase blocks and 6-inch manilla rope falls with all necessary shackles, etc., will be supplied for emergency use. The hoisting engines will be of the vertical double cylinder high pressure type, having cylinders 13 ins. in diameter by 13 ins. dia. by 15 in. stroke geared, to allow for hoisting the ladder at a speed of 10 ft. a minute with steam at 90 lb. pressure. Two powerful mooring winches will be fitted on board, one forward and one aft. These winches will have plain drums for the head and stern wires, and whelped drums for the port and starboard chains arranged to work independently by friction clutches. The hopper space will be divided into 10 divisions each being fitted with a door constructed of white oak, and protected by steel plates, and operated by a heavy winch of the usual hopper door winch design. The lifting gear will consist of chain of heavy scantlings, working over pulleys, fitted on hopper beam and connected to door by eye plates. The hoppers will be fed by two chutes, one forward and one aft, on both sides, each division being filled by the shutting of its directing door which will be of heavy design.

A complete system of electric light will be provided, each room being supplied with the usual fittings and all deck clusters navigating and dredging lights being of the usual requirements. The generating set will be in duplicate, coupled to high speed enclosed forced lubrication compound engines, developing 43 b.h.p. at 50 r.p.m. There will be 2 dynamos, each capable of generating an output of 25 k.w. at 110 volts. The steam steering gear will be in the engine casing and connected to steering column on bridge by chains and controlling rods. The engine will be of the combined hand and steam type. The navigating and dredge masters' bridges will be on main and fore framing respectively, each being fitted out complete with steering column, compass, engine room dredging and winch telegraphs.

The accommodation for officers and men will be very complete, the former being located on the bridge deck, the latter on the lower deck. Each officer will have his own room with the usual fittings in a vessel of this class. The bathrooms, galleys, messrooms, and pantries will be on the bridge deck and all fitted out with due regard to the service intended. The crew will be divided into separate rooms for seamen, firemen, oilers, etc., each room being fitted up with the usual beds, seats, lockers, etc.

A large crane capable of lifting the lower tumbler, or one of the buckets,

will be fitted on the forecastle deck so as to be available for overhauling purposes. A large cold storage room will be fitted up with all necessary fittings for the preservation of supplies.

The hull structure will be in excess of Lloyd's requirements for the 100 A.1 class in which the vessel will be registered, and nothing is being spared to add strength and rigidity to the vessel, to resist the heavy stresses which will be brought to bear on the various members during dredging operations. The vessel will be divided into 14 watertight compartments, each being pumped by a separate steam suction. Protection to the shell will be by 2 large fenders extending round the vessel and having vertical fenders between and chafing posts in way of barge moorings. The sanitary, steam heating and water systems will be complete in all details, each room being supplied with all necessary accommodation. The life saving appliances will be in accordance with the latest rules of the Canadian Steamship Inspection Act, and will include 2 life boats, an anchor boat and a dinghy. The fire service will be complete in all details, with full amounts of hose, buckets, hatches, fire extinguishers, etc.

The dredge, the completion of which has been delayed owing to war conditions was designed by Charles Duguid, naval architect, Marine and Fisheries Department is in an advanced stage of construction at the Canadian Vickers works, Montreal, and is expected to be launched during the autumn so that dredging operations can be commenced in the early spring of 1917.

Shipping Documents and Censorship Delays.

Owing to complaints which have been made as to the delay caused by postal censors in dealing with shipping documents passing through the mails, the Port and Transit Committee, Admiralty House, London, Eng., has issued a notice as follows:—"Difficulties are being caused in arranging the removal of goods from docks, wharves and warehouses, by the late delivery of shipping documents, necessary for customs clearance, sent through the post and therefore passing through the Postal Censors' department. This committee has been in communication with the authorities of the Postal Censors' department, and has arranged, in consultation with them, that if such documents are posted in envelopes distinctly marked as containing shipping documents only, the staff of the Postal Censors' department will endeavor to deal with them with special expedition. Envelopes containing these documents should be clearly marked 'Shipping Documents' by means of a rubber stamp and not by handwriting. Shipping documents are defined to be,—bills of lading with or without drafts, invoices, manifests, parcel receipts and certificates of origin or destination. The enclosure of other correspondence in an envelope so marked is forbidden, and it is essential that this restriction be strictly observed. Any departure from this rule will assuredly cause greater delay."

The Panama Canal Act and Steamboats with Canadian Connections.

The Interstate Commerce Commission has dealt with a number of applications under the Panama Canal Act, covering the operation of certain steamboat lines controlled by railway companies, for extensions of time under which the railway companies can continue to operate or control the steamboat lines, and for declarations that such operations are not in contravention of the Panama Canal Act. Among these companies, are the following, which have connections, directly or indirectly, with Canadian points.

Delaware and Hudson Boat Lines.—The Delaware & Hudson Co. operates a railway between Rouses Point, N.Y., and Wilkes-Barre, Pa., with branch lines into the Adirondacks and elsewhere. It controls the Champlain Transportation Co., through the ownership of practically the whole of the capital stock, and indirectly controls the Lake George Steamboat Co., the former maintaining a service on Lake Champlain, and the latter on Lake George. The Champlain Transportation Co. operates three steamboats, Chateaugay, Ticonderoga and Vermont, all being too large to permit of passage out of the lake by canal, and are primarily engaged in passenger transportation, of which a large proportion consists of tourists, a full service being given during June, July and August. By means of these vessels, the D. & H. Co. competes to some extent with the Rutland Rd. and the Central Vermont Ry. on the east side of the lake, and neither of these companies has asked for through rates and joint rates, and the transportation company has intimated that should either of them ask for such routes and rates, it would be the policy of the company to grant them on a reasonable basis. The freight handled by the vessels may be regarded as negligible. Considered by itself, the operation of the steamboats is not financially successful, and last year they were run at a loss. The facts show that the company's operations are purely incidental to its real relation to the D. & H. Co., which is to provide an alternate route for summer tourists travelling over its rail lines, and are simply a means by which the company is enabled to enlarge its passenger traffic between New York and Montreal and intermediate points. The Lake George Steamboat Co. has three steamboats, Horicon, Mohican and Sagamore, and the passenger traffic there is purely of the summer tourist variety. In the course of the hearing some reference was made to some apparent irregularities in a local rate tariff, involving preference to four individual shippers, and the company undertakes to correct this. The company had doubts as to the Commission's jurisdiction over the Lake George Steamboat Co., on the ground that Lake George is wholly within New York State, but it appeared to be obvious that the company was engaged in interstate business, and apart from that the wording of the Panama Canal Act left no room for controversy on that point. The extension was granted.

Central Vermont Transportation Co.—

The Central Vermont Ry. owns the entire stock issue of this company, and over 70% of the C.V.R. stock is owned by the G.T.R. The C.V.R. operates railway lines from St. John's, Que., and Rouses Point, N.Y., through Vermont, Massachusetts and Connecticut to New London, where connection is made with the C. V. T. Co.'s boats for New York City. Some years ago the C.V.R. desiring to build a line

from Palmer, Mass., organized the Southern New England Rd. Corporation and the Southern New England Ry. Co., and holds the entire stock of these two corporations. It also caused the C. V. T. Co. to increase its capital stock from \$200,000 to \$1,000,000, and to have built two combination passenger and freight steamships for operation between New York and Providence. It further guaranteed the principal and interest of \$1,000,000 5% gold bonds issued by the C. V. T. Co., of which it has already paid \$350,000. The C. V. T. Co. now operates between New York and New London two freight steamers, and has docked at New London, awaiting the completion of the Palmer-Providence line, the two new steamers referred to. For the purposes of this investigation the existing and the proposed boat services may be considered as though operated or proposed to be operated directly by the C.V.R., for while the C. V. T. Co. is a distinct legal entity and has an organization, it has several officers in common with the railway, does no transportation business in its own name, files no tariffs, issues no bills of lading, solicits no traffic, and receives none except such as is delivered to it by the petitioner, and handles no funds, its accounts being kept and expenses paid by the railway. It is apparently allowed only sufficient divisions to cover expenses. No dividends have been declared on its stock. The C.V.R. leases pier 29, East River, and pays all of the expenses in connection therewith, and also of solicitation. The traffic handled by the C. V. T. Co. from June 28, 1909, to Feb. 28, 1916, was:—

	From New York Tons	To New York Tons
June 28, 1909, to June 30, 1910..	273,228	85,196
Year ending June 30—		
1911	244,582	88,666
1912	260,660	69,065
1913	288,214	57,375
1914	331,590	58,766
1915	332,623	47,491
Differential	165,673	37,890
July 1, 1915, to Feb. 7, 1916.....		
Total	1,896,570	444,449

The proportion of this traffic which originated at or was destined to points on the C.V.R. is not shown, but a large portion of it was interchanged with the G. T. R. The decrease in the tonnage to New York is explained to be the result of the cancellation in Sept., 1911, of joint rates, which have been republished since the hearing, between New York and points on the Boston & Maine Rd. This cancellation, it was claimed, caused a loss in revenue of over \$100,000 a year, due to the diversion of traffic to other routes. The rates of the water-and-rail route of the C.V.R. and G.T.R. from New York to Chicago, Ill., and other central freight association points were, prior to the recent general increase, lower than the all-rail rates by the following differentials:

Class	1	2	3	4	5	6
Differential	10	8	6	4	4	3

Between C.V.R. stations and New York there are no differentials in favor of the rail-and-water routes. The C.V.R. participates in through routes and joint rates between New York and points on its line in connection with the B. & M. Rd. from South Vernon, Vt., to Springfield, Mass., and the N. Y., N. H. & H. Rd., between the latter point and New York, and to a limited extent in connection with the latter to and from New London. From points south of Brattleboro, Vt., there are no joint rates to or from New York in connection with the New Haven except on

such traffic as cannot, because of its nature, move by boat. On forest products and other heavy low grade traffic the C. V. R. also participates in through routes and joint rates from points on its line to New York in connection with the N. Y. C. & H. R. and West Shore Rds. and intermediate carriers. The testimony is that all traffic which can be economically and satisfactorily handled by a rail-and-water route is routed in connection with the boats of the C. V. R. Co. unless specifically directed to the contrary by shippers. At four points on its line the petitioner meets competition from the New Haven, which has both all-rail and rail-and-water routes to New York, and at Norwich, Conn., from the Norwich & New York Propeller Co., an independent line operating a triweekly service in each direction between New York and Norwich and New London. A number of shippers from points on the C.V.R. testified as to the reliability and generally quick and satisfactory character of the service furnished by it. There was no testimony by shippers or others in opposition to the application. There are now two boat lines between New York and New London in addition to the one under consideration. One, operated by the New England Steamship Co., a subsidiary of the New Haven, furnishes a daily service, and, with the other water lines operated by that company and also by the Hartford & New York Transportation Co., another subsidiary of the New Haven, is now the subject of an investigation upon an application under the Panama Canal Act. The other, known as the Chelsea line, is the one above referred to, operated by the Norwich & New York Propeller Co.

The President of the C.V.R. testified that it was its purpose to complete as soon as practicable the line from Palmer to Providence, on which more than \$6,000,000 has been expended. Since Aug., 1913, when work was resumed after an interruption, due, it is claimed, to financial difficulties, the expenditures on the portions in Massachusetts and Rhode Island have amounted to \$2,612,870.89 and \$1,206,642.14, respectively. Providence is now served by three steamer lines to New York, namely, the New England Steamship Co., the Hartford & New York Transportation Co., and a line independent of railway control, the Colonial Navigation Co. The wharves of these three lines are on the east side of the harbor, and the boats of the transportation company will land on the west side. While ordinarily there might be some question as to the wisdom of passing upon an application for permission to install a water service in a case where the date of its inauguration is so uncertain, the Commissioners think that the circumstances and conditions here appearing justify action at this time on that portion of petitioner's application. Upon the inauguration of the New York-Providence service there would seem to be no question but that the petitioner might, in connection with either of its steamer lines, compete with the other, for it would have two rail-and-water routes between New York and points on its own line and on the G.T.R. and its connections. The Commissioners therefore deem it unnecessary to enter into a discussion as to whether or not petitioner does or may compete with the C. V. T. Co. under present conditions. However, in order to maintain a satisfactory route from New York to the west at rates substantially lower than those ap-

plicable via the all-rail routes, it would seem to be necessary for the C.V.R. which serves no large city with its own rails, to operate, or control the operation of, boats between New York and New London; and, if the extension of the rail line to Providence is to have the effect of increasing the value of the route of the C.V.R. and the G.T.R. between New York and the west as a competitive force, it would likewise seem necessary for the petitioner to operate, or control the operation of, boats between New York and Providence. The application was granted.

Boston and Maine Rd.—This application covered the operation of the s.s. Washington on Lake Winnepesaukee in New Hampshire. The traffic carried on is purely a summer one and local. On account of its size, the vessel cannot serve more than 6 of the 32 landing places on the lake, the balance being covered by other independent companies. The company has offered to sell the vessel, but makes a stipulation that the service is to be maintained at its present efficiency for the summer residents. The company also owns the s.s. Lady of the Lake, operating on Lake Memphremagog, situated partly in Vermont and partly in Quebec. This vessel, which is registered in Canada, touches at one port only in the U.S. The B. & M. R., in connection with the C.P.R., publishes a joint fare of \$1.75 between Newport and Magog at the head of the lake in Canada, the rail distance being 59 miles. The distance by water is approximately 30 miles and the fare is 85c. There is a competitive company, the Memphremagog Navigation Co., which also serves Newport. No request has been made to the B. & M. R. for through routes and joint fares in connection with that company, and it was intimated that if such request were made, it would be granted. The B. & M. R. has endeavored to sell the vessel, and would do so now, if a purchaser could be found. It was decided that so long as the vessels were operated as at present, they were in the public interest, and the application was granted.

Maine Central Rd.—The company operates a steamboat service from Mount Desert Ferry, Me., to various points on Mount Desert Island and on Frenchmen's Bay, and a similar service from Rockland, Me., to various points in Penobscot Bay, and between Bath and Woolwich on the opposite sides of the Kennebec River. The operation of vessels on the last named route are possibly within the Panama Canal Act technically, but as their continued use by the Maine Central violates none of the provisions, it need not be further considered. The Mount Desert line is run chiefly for the benefit of summer traffic, as is also the Penobscot Bay service, both of which, by themselves, were operated at a loss during 1915. The Eastern Steamship Co., an independent line, runs vessels through Penobscot Bay, calling at the same ports, and it was shown that all the traffic could not be handled by the vessels of either company alone, and that the Eastern Steamship Co.'s service has not been modified since the B. & M. service was inaugurated. The application was granted.

During the continuance of the war, the regulation of the internal traffic in Halifax harbor is under the direction of the Department of Naval Service, as represented by the Captain Superintendent of H. M. C. Dockyard. All masters of vessels, pilots and all other persons concerned must obey the instructions issued by him or his representatives.

The Submersible Vessel Deutschland.

The recent arrival and departure of a German submersible vessel at Baltimore, Md., have occupied considerable space in the daily press, and comments thereon have in many cases been made in sheer ignorance as to the actual value to be placed on such trips. The whole matter should be viewed in its true perspective, and neither magnified into an abnormal achievement, nor minimized into something of no account. If it was intended to prove that it was possible for a vessel to cross the Atlantic under water, then the trip failed, as it was not claimed that the trip was made under water for the whole way, somewhere about one third of the distance being accomplished under water. Apart from this, it is claimed in England with some show of authority that submersible vessels had already crossed the Atlantic, from Canada to England, last year, without fanfare of trumpets. Again, if it is intended to show that blockade running can be successfully carried out by the Germans, the success achieved so far is infinitesimal, and at a really prohibitive cost. Information which has been made public, as to the cargo and of the vessel itself is vague and contradictory, so that it is not possible to build correctly on what has been obtained. Some calculations have been undertaken by Engineering, London, Eng., with the information it had at hand, and these show that submarine navigation with vessels of the type used is a commercial and financial impossibility. Assuming a surface displacement of 2,000 tons, with a length of 300 ft. and 30 ft. beam, with a collective b.h.p. of 2,600, the surface speed would be 14 knots an hour. With these dimensions a deadweight cargo capacity of 800 to 1,000 tons is impossible, and under the most favorable conditions regarding disposition of weight in the vessels and her machinery and stores, a greater cargo than 350 tons could not possibly be carried by a submersible vessel of 2,000 tons surface displacement. The hull, including the ballast keel, water and air service, auxiliaries, electric cables, fittings, etc., will weigh about 1,100 tons. There is of course a difficulty in determining exactly the electrical equipment for propulsion when submerged, and the power available and the speed obtained when submerged, but there is room only for a slight percentage of error. The captain stated that he proceeded 90 miles under water without requiring to charge his accumulators, so that his radius of action is provided by his storage batteries. The machinery, including the main Diesel engines, electric motors, storage batteries and lubricating oil, would approximate 260 tons. The capacity of the fuel oil tanks has been stated as 190 tons. The crew, fresh water, provisions and other stores cannot be put at less than 60 tons. The remaining weight, including trimming ballast, gun and ammunition, which it is stated were carried for protection, may be taken as 30 tons. The total of the weights as given, shows that out of a 2,000 ton surface displacement, there is left only 350 tons as cargo deadweight carrying capacity. The weights allowed give an approximate radius of action of 4,500 nautical miles at 14 knots an hour, and 6,650 nautical miles at 11½ knots. Assuming the reserve buoyancy as 55% of the surface displacement, the displacement when submerged would be about 3,100 tons.

Stranding of the s.s. Arachne Investigated.

An investigation into the causes of the stranding of the British s.s. Arachne, near Point Plate, Miquelon Island, June 20, was held at Quebec, Que., recently, before Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Commander E. G. V. Elliott, R.N.R., and Lieutenant J. A. Murray, R.N.R., as nautical assessors. The Arachne was bound from Montreal with a cargo of wheat in bulk and bags. The master, G. R. Sargent, stated that the weather was thick intermittently, and he was on deck continuously, with the officers of the various watches. He believed he heard the horn at Point Plate, but did not know it to be that horn, taking it to come from a sailing vessel, and believing he was on a right course, there was no influence to cause him to go in a different direction. The telegraph remained at full speed until the time of the stranding, but verbal instructions were given to ease off steam, which was done. On seeing a dark shadow ahead, he gave orders for full speed astern, but the vessel grounded. After this orders were given to launch the boats, and soundings were taken when it was shown in his estimation that the vessel had run about one third of her length on the rocks. He came to the conclusion that she could not be refloated without assistance, and proceeded to St. Pierre. On his return 800 tons of grain were jettisoned and 1,200 tons put into lighters, and with the assistance of other vessels his vessel was released eight days after she struck. Evidence of the other officers shows that they accepted the courses given to them by the master, and did not verify them by consulting the chart.

The court decided that in view of the master's conduct, and taking into consideration his long service without accident, also his frank confession of the facts as they occurred, without any attempt at prevarication, it would show its appreciation of such evidence and his long good record, by not retaining his certificate, but censuring and reprimanding him severely for the non-accomplishment of simple navigation principles, which, although ordinary, are necessary. The court also had in mind the scarcity of experienced masters occasioned by the abnormal conditions existing. The court also cautioned the master that he should see that his officers have sufficient ambition to ascertain for themselves that the courses given them are right, for the benefit of all concerned. Regarding the first and second officers, J. E. Turner and E. Evans, who are men of long experience in sailing and steam vessels, the court was astonished to note the lack of ambition displayed on their part, in accepting the information conveyed to them by the officer being relieved, as to the course, without ascertaining if it was one which would carry them safely through the watch, and in view of this lack of interest, they were warned and reprimanded severely. The conduct of the engineers was beyond reproach.

The Robert Reford Co. has been appointed agent for the Compagnie Generale Transatlantique, at Halifax, N.S., in place of S. Cunard & Co., whose shipping agency business there has been taken over.

The British s.s. Athos, which grounded near Trepassey, Nfld., recently, was temporarily repaired there, and then taken to St. John's, where she was docked for overhauling and complete repairs.

Rebuilding the s.s. W. C. Moreland.

There is proceeding at Superior, Wis., a combined new construction and repair job of unusual character. The salvaged stern section of the s.s. W. C. Moreland, wrecked and sunk nearly six years ago, is being repaired at the same time that a new forward end is being built. The two sections will be joined and the rebuilt 600 ft. vessel completed in time to enter the autumn lake trade. The after end was raised five years ago and after fruitless efforts were made to sell it, was again sunk. The same conditions which operated to recall to salt water service many hulks that had apparently sailed for the last time, also gave renewed value this year to this wreck, as it rested on the bottom of Lake Huron. The assurance of an enormous freight movement in 1916, culminating in the autumn when grain shipments begin their eastward journey, resulted in the stern again being raised. After being sold twice, it was placed in drydock at Superior under rush orders to rehabilitate the vessel and to commence the immediate construction of a new bow. The W. C. Moreland was launched originally July 27, 1910, at Lorain, Ohio, and was built for the Johns & Laughlin Steel Co., Pittsburg, Pa. Her original dimensions, which she will maintain in her reconstructed form, were 600 ft. over all, 580 ft. keel, 58 ft. beam and 32 ft. deep. Her carrying capacity was 12,000 tons.

The wreck which condemned her to almost six years of idleness, occurred on her maiden trip. Down bound with a cargo of 10,700 tons of iron ore, she stranded on the rocks at Eagle Harbor, Lake Superior, Oct. 18, 1910. The site of the accident is one of the most dangerous on the lakes, owing to its exposed position. Wreckers were immediately ordered to her, but heavy weather prevented work and she was abandoned by her owner as a constructive total loss on Nov. 2. At the time of the accident, she was the largest vessel ever lost on the lakes. She was broken into three parts. Breaks in the hull occurred at hatches 12 and 24. Following repeated efforts, the Reid Wrecking Co. raised the after portion of the vessel in the autumn of 1911. After being successfully bulkheaded, it was towed to Detroit, in Sep., 1912. The salvaged section was 292 ft. long. Unsuccessful efforts were made to sell the recovered section. With steel selling at the comparatively low prices of 1912, it was cheaper to build a new boat. The wreck, therefore was sunk in shallow water where she rested until last spring. The great increase in steel prices, with consequently higher costs for new vessels, coupled with the enormous demand for tonnage to move the record breaking 1916 freight, united to enhance the value of the salvaged section. R. M. Wolvin, Winnipeg, purchased her and she was raised and placed in drydock at Detroit. A few weeks ago she was towed through Lakes Huron and Superior, past the scene of her wreck, to Superior, Wis., and was sold to Canada Steamship Lines, Ltd. When completed she will sail under Canadian register.

Work on the new bow was begun in February and this section was expected to be launched in August. Work is being pushed on the after end. Both sections is expected to be ready to be placed in drydock at once, when the work of joining them will be started. Every effort is being made to complete the work in time to permit the vessel to participate in the heavy freight movement, and it is expected that she will leave Superior

on her initial trip late in September. The refitting of the stern presented some unusual problems in ship yard work, all of which were successfully met. The entire bottom of the after end from frame 125 to the engine room, about 165 ft., including the whole inner bottom construction as well as the hopper sides, was cut out completely. One arch beam or division between hatches was cut out and replaced.

All electrical equipment was replaced, the after deck house was almost completely rebuilt and all woodwork in connection with the cabins was renewed. While about two thirds of the ballast piping in the after section was utilized, it was necessary to remove practically all of it in order to permit reconstruction work on the hull. Most of the plumbing and steam pipes were renewed, the steering engine was overhauled and the steering chains and cables renewed. The boilers and engines were found to be in fairly good condition, but a great amount of overhauling was necessary.

Furness Withy and Co.'s Report.—The report for the year ended Apr. 30, shows profits, including amount brought forward, of £1,528,406 1s 4d., an increase of £743,529 4s 1d over the previous year. The half yearly dividend on the preference shares was paid Nov. 1, and three quarterly dividends of 10% per annum, free of income tax, have also been paid, leaving an available balance of £346,531 1s 4d. Of this amount, £350,000 has been transferred to depreciation account, and £300,000 has been allocated to a trade contingency fund, bringing this fund up to £500,000. This fund was inaugurated to strengthen the company's position and in order to meet any competition which may arise after the war. A further £20,000 was appropriated for division among the masters, officers and engineers of the company at the end of the war, and it was decided to pay a bonus of 10% free of income tax on the ordinary shares. After the payment of the foregoing, £395,281 1s 4d was carried forward to the current year's accounts.

Claims re Loss of s.s. Titanic.—Final judgment was delivered in the Federal District Court, New York, July 31, disposing of all the claims against the Oceanic Steam Navigation Co., in connection with the loss of the s.s. Titanic, Apr. 15, 1912. The original claims were about \$15,000,000, but were eventually reduced to about \$3,000,000. The liability of the company was limited under U.S. statute, to the amount of freight and passenger money collected for the last voyage, and for the value of the lifeboats' salvage. This was estimated by the company to be \$117,101, and this was deposited in court. A settlement was subsequently arrived at by which the company paid about \$665,000 in settlement of all claims. The judgment held the company guiltless of any privacy or knowledge as charged against it, and not liable to any extent for loss arising out of the collision.

The International Mercantile Marine Co.'s earnings for six months ended June 30 were \$33,400,000, the earnings for June being \$6,900,000. These figures represent the net operating revenue and do not cover the amounts for war tax, interest and depreciation. The war tax for the six months was approximately \$12,400,000. The balance is equivalent to \$40.50 a share on the \$51,730,000 of preferred stock, or at the rate of \$81 a share for the year. The accumulated dividends on the preferred stock amount to \$82 a share.

Purchase of St. Lawrence and Chicago Steam Navigation Co. Approved.

At a special meeting of shareholders of Canada Steamship Lines, Ltd., at Montreal, July 27, the purchase of the St. Lawrence & Chicago Steam Navigation Co.'s stock was formally approved. J. W. Norcross, Vice President and General Manager, stated that the opportunity of purchasing the controlling interest in the St. Lawrence & Chicago Steam Navigation Co. presented itself some time ago, but because they could not obtain complete control, the governors of the Canada Steamship Lines' guarantee fund declined to sanction the purchase. Later, a syndicate made up of directors of Canada Steamship Lines, purchased the stock and now proposed to turn over to the company 9,664 shares of the St. L. & C. S. N. Co. at \$187.75 a share. In addition to this amount, which represents the purchase price of the shares, the syndicate will receive an amount equal to the net earnings of the St. L. & C. S. N. Co. between Apr. 20 and July 31, the period when the property was in its hands.

A letter was read from E. H. Mussen, Toronto, protesting against the purchase on the ground that although Canada Steamship Lines had just passed through two years of the most profitable period in the history of navigation, it had only been able to pay one dividend, and that if there was any money to be expended, the shareholders should get some benefit from it. It was explained that the purchase was not being made out of earnings, but on capital account, the money at present being held by a board of governors, it having been received as insurance on lost vessels. Included in the transfer was cash to the extent of \$400,000.

Suggested Underwriters' Agent for Newfoundland.—A Newfoundland shipmaster, said to be holding a Government position, has written to a New York shipping paper relative to the desirability of the underwriters appointing an agent in the colony, so as to be in a position to act quickly in case of a wreck. The usual method appears to be to wait the arrival of a surveyor from New York before commencing salvage operations. In many cases the vessel begins to break up before he arrives, and this delay is responsible for the large proportion of total losses along the coast. Naturally, if there was a resident agent with authority to begin salvage operations whenever such are deemed advisable, a material reduction would be experienced by the underwriters in the amounts they would be called upon to pay for total losses.

The s.s. Pere Marquette No. 5, formerly owned and operated by Pere Marquette Line Steamers, Manistee, Mich., has been sold to William N. MacDonald, Sydney, N.S. She is a freight and passenger vessel and was built at West Bay City, Mich., in 1890. She is of oak with diagonal strapping on frames, bow strengthened for ice, wooden arches, bottom sheathed with iron for winter service, windlass between decks with no efficient bulkhead abaft same, complete electric light plant, triple expansion engines with cylinders 19, 30 and 52 ins. diam., by 40 ins. stroke, 1,000 i.h.p. at 84 r.p.m., and supplied with steam by two Scotch boilers 11½ by 11 ft. at 150 lbs. Her dimensions are, length 226 ft., breadth 38 ft., depth 26 ft.; tonnage 1,722 gross, 1,296 register.

Depreciation of Vessel Property

At a meeting of the executive committee of the Dominion Marine Association, at Toronto, recently, consideration was given to the Business Profits War Tax Act of 1916, and recommendations were made and forwarded in the form of a letter to the Minister of Finance. These recommendations dealt with the uniformity in returns filed under the act, with particular reference to deductions for depreciation, and the following schedule was suggested:—

- | | |
|---|---|
| (a) For steel built steam lake freighters | 3% per annum on the original cost of new vessels, including only structural additions |
| (b) Steel built barges | 5% " |
| (c) Composite steamers and barges | 5% " |
| (d) Wooden steam freighters | 7½% " |
| (e) Wooden barges, including schooners | 10% " |
| (f) Passenger boats, wooden or steel | 7½% " |
| (g) Steel tugs | 5% " |
| (h) Wooden tugs | 7½% " |

The resolution points out that this schedule is submitted as a suggestion of what vessel owners consider fair, having due regard to the many conditions governing, and that the association is fully representative of the tonnage on the inland waters of the Dominion, and is actuated by no desire to reduce unduly the contributions its members should make under the act.

Mainly About Marine People.

Aubrey McElhinney, dentist, who died in Ottawa recently, was the second son of the late Capt. M. P. McElhinney, who was on the Marine Department's staff for many years.

Capt. Gow, heretofore Marine Superintendent, Dollar Steamship Co., is reported to have been appointed Superintendent of Loading, Canadian Pacific Ocean Services, Ltd., Vancouver, B.C.

W. H. Fogg, heretofore secretary to Manager, and Stationery Agent, Grand Trunk Pacific Coast Steamship Co., Vancouver, has been appointed chief clerk in Manager's office, with duties as hitherto.

R. Richardson, who has been appointed a sub-lieutenant in the naval motor boat patrol, and has left for England, is a son of H. W. Richardson, of J. Richardson and Son, Kingston, Ont., vessel owners, and Vice President Great Lakes Transportation Co.

Robert D. Keay, General Manager, Yarrows, Limited, Esquimalt, B.C., who died recently, was appointed to that position when the company purchased the B. C. Marine Railways Co., about two years ago. He had been connected with the Yarrows company in England for 18 years prior to that.

Capt. Nilson, who has been appointed Marine Superintendent Coastwise Steamship and Barge Co., Vancouver, B.C., has been with the company since its incorporation in 1912. He was master of the s.s. Amur for some time, and on the company purchasing the s.s. Turret Crown, he was given command of her during her Atlantic coasting charter, and on the completion of that he sailed her to the British Columbia coast, by way of the Panama Canal.

Capt. Hiram Rowe, who died at Colingwood, Ont., Aug. 5, aged 72, was born at Welland, and at an early age took up sailing on tugs and barges on the old

Welland Canal. In 1869 he went to Georgian Bay in charge of the tow barge Ontario, in 1870 was appointed mate of the tug Wales, and in 1871 was mate on the s.s. Chicora, which was then sailing on the upper lakes. He subsequently acted as master of a number of tugs and retired in 1875.

Caution to Navigators re Quebec Bridge Construction.—During July the construction of two heavy steel apparatus, which will be suspended from the outer or river side ends of each of the cantilever arms of the uncompleted Quebec Bridge, was begun by the contractors. These apparatus are to be used in connection with the guiding and lifting of the centre span from scows in the river below, which operation is expected to be completed some time before the close of navigation. The maximum clear distance between the north and south apparatus when in vertical position is 636 ft. These apparatus will be a menace to navigation, as they will extend vertically from the ends of the cantilever arms to about 20 ft. above high water. The lower end of each will be marked with a red light, visible from all points of approach, and they will be suspended from the bottom end of the construction as it progresses. The main portion of this apparatus, when completed, will be drawn up shoreward close to the bottom of the cantilever arm, in which position there will be a clearance of 100 ft. above high water. During fog, vessels are specially cautioned to avoid colliding with the above apparatus, which will be supported from the extreme end of each cantilever arm.

Proposed Further Diversion of Water from the Great Lakes.—The Rivers and Harbors Bill, which among other things contained an amendment approving of an expenditure of \$5,000,000 by the State of Illinois in connection with the canal from Lake Michigan towards the Mississippi River, and restricting the amount of water to be taken from the Great Lakes, to the amount fixed by the Secretary of War in 1912, came before a joint committee of Congress at Washington, D.C., recently. The committee could not agree as to the restriction of water to be taken, and all reference to it was struck out of the bill, which leaves the matter as it was, except that the Secretary of War has had the matter brought prominently to his attention, and is likely to take steps to prevent the use of more water than was permitted in 1912.

Applications for Power Development in the St. Lawrence River.—The Dominion Marine Association's executive committee, at a recent meeting, passed a resolution calling attention to the application of the Beauharnois Light, Heat & Power Co., for approval of plans for development of power on a large scale in the St. Lawrence River, and to the association's attitude as expressed in previous resolutions that no further power concessions in the St. Lawrence be granted until the whole matter of power development be dealt with, with due regard to the requirements of navigation, and that the association be given an opportunity to consider such plans in detail, and make proposals. Copies of the resolution were forwarded to the Premier and the Minister of Public Works.

The Hudson's Bay Co. has placed its steamship Discovery, which was specially built for Antarctic exploration, at the disposal of the Admiralty, free of all cost, for the rescue of the Shackleton party who were left on Elephant Island.

Canada Steamship Lines Notes.

The s.s. Strathcona, which was in collision with the s.s. Glencoe in British waters recently, has been repaired at Middlesbrough, and is now running on charter between United Kingdom and continental ports.

The s.s. Christopher, owned in Chicago, collided with, and sank the s.s. Topeka, owned in Milwaukee, in the Detroit River, near Sandwich, Aug. 15. The wreck is lying in 30 ft. of water on the Canadian side of the river.

A dividend of 1¼% on the company's preference stock was paid Aug. 1, and it is stated that an additional 1¼% will probably be paid Nov. 1, clearing up the arrears of dividend, and that a full payment of the 7% dividend for the current year will also be made.

The steamship which is under construction for the company at Detroit, Mich., some details of which have already been given, is to be named Sir Trevor, after Sir Trevor Dawson, a member of the company's advisory board in London, England, and who is also associated with Furness, Withy & Co., and Vickers, Ltd.

In commenting on the acquirement of the St. Lawrence & Chicago Steam Navigation Co.'s vessels, By-Water Magazine states that the "Haggerty, Hostler, Matthews and the Iroquois will carry the C. S. L. flag after Aug. 1." The names of the vessels acquired are, J. H. G. Hagarty, E. B. Osler, W. D. Matthews and Iroquois, respectively.

Some figures relative to the recent record cargo of 490,720 bush. of grain brought down from the head of the lakes by the s.s. W. Grant Morden, show that with an average yield of 17 bush. to the acre it would take 28,886 acres to grow the amount, which if all turned into flour would produce approximately 109,050 barrels. In turn, if this flour was made into bread it would make approximately 21,809,000 loaves of 24 oz. each.

The company's new steam tug J. R. Binning arrived in Montreal harbor at the end of July. She was built at the company's yards at Sorel (Sorel Shipbuilding & Coal Co.), and was launched at the end of June. The hull is of oak and the superstructure of pine, and she has accommodation for a crew of eight. Her dimensions are, length 66 ft., breadth 16 ft., depth 10½ ft. She has speed of 11 miles an hour, and is named after the Manager of Furness Withy & Co. at Montreal, who is also a director of Canada Steamship Lines, Ltd.

The Playter Transportation Co., Ltd., has been incorporated under the Ontario Companies Act, with \$40,000 authorized capital and office at Owen Sound, to carry on a general steamship and navigation business. The company's officers are:—Morley Lemon, Owen Sound, President; W. T. Moore, Meaford, Vice President; J. G. Telfer, Owen Sound, Secretary-Treasurer; and J. C. Butchard and G. Cleland, and latterly by the Georgian Bay Navigation Co., Owen Sound. She was built at Benton, Mich., in 1889, and was named Mabel Bradshaw. She is of steel, of the hurricane deck type, with dimensions, length 137 ft., breadth 25 ft., depth 16 ft., tonnage 500 gross, 296 register, and she is equipped with fore and aft compound engine with cylinders 16 and 28 ins. diam., by 26 ins. stroke, 250 i.h.p. at 105 r.p.m., and supplied with steam by a boiler of the firebox type, 8 x 12 ft., at 125 lbs.

Canada West Coast Navigation Co. Limited.

Some details of the incorporation of this company and its programme have already been published in Canadian Railway and Marine World. It was incorporated under the Dominion Companies Act with a capital of \$2,500,000 and office at Vancouver, B.C. Among those interested are, Jas. Carruthers, J. W. Norcross, Sir Trevor Dawson and M. J. Haney, all connected with Canada Steamship Lines, Ltd.; J. F. M. Stewart, of Lake Commerce Ltd., Toronto; R. M. Wolvin, Winnipeg, and H. W. Brown, formerly associated with the Pittsburg Steamship Co., Pittsburg, Pa. R. M. Wolvin has been elected President, J. F. M. Stewart, Vice President, and H. W. Brown has been appointed General Manager.

The incorporation of the company is an outcome of the British Columbia Government's recent act for aiding shipping and shipbuilding within the province, which, among other things, provides for the payment of a subsidy to the owner of any vessel, or vessels, to the number of 25, built in the province, and operated from any port therein, and returning to any port in the province for re-loading. The subsidy is payable in ten annual instalments, the first to be in respect of the first year after the declaration of peace in respect of the present war, and so computed as to bring the net earnings of the ship for the year in respect of which the subsidy is payable, up to 15% on the actual cost thereof, but the actual subsidy payable must never exceed an amount equal to \$5 a ton of deadweight cargo capacity in any one year. The subsidy is payable to the bona fide owner of the vessel, or to his assigns who actually operate the vessel, and the subsidy is not liable to attachment or any process of execution, and in the event of conflicting claims, the decision of a commission set up under the act, is binding, and without appeal.

This company has so far placed contracts for the building of eight vessels, six being built at the Wallace Shipyards, North Vancouver, and two by the Cameron-Genoa Mills Shipbuilders, Ltd., Victoria. They are wooden auxiliary motor ships, five masted, and known as the bald headed schooner type, that is, they do not carry any top sails. They will be equipped with two 160 h.p. Bolinders semi-Diesel engines, driving twin screws. The dimensions will be, length over all 255 ft., length of keel 225 ft., depth

moulded 21 ft. 4 ins., breadth extreme 44 ft. Their gross tonnage will be about 1,500 tons and their deadweight capacity about 2,500, with a lumber carrying capacity of about 1,500,000 ft. b.m. They will follow the latest and best practice of the builders of United States schooners designed primarily for the lumber trade, and will be of very heavy construction. The plans have been approved by Lloyd's Register of Shipping and they are to be given the highest rating, A.1 for 13 years. This, we are advised, is the first time that Lloyd's have classed any vessels of this type on the Pacific coast. The vessels will be provided with two large hatches and four cargo winches of the latest type, designed for rapid handling of cargo. Vessels of this type carry approximately 50% of their cargo on deck, and they are designed chiefly for the off shore lumber trade. The cost of these vessels complete will be about \$175,000. The keels of four of them were laid at North Vancouver recently, and two of them are now in frame. It is expected that the first will be launched about Dec. 1, and completed about six weeks after. Following this, it is expected that they will be turned out at the rate of one each month, the last to be ready for sea by July, 1917. Three of the vessels have been named respectively, Mabel Brown, Geraldine Wolvin and Jessie Norcross. The vessels were designed by J. H. Price, who designed and built the vessel City of Portland, a large auxiliary motor ship, at St. Helens, Ore., which attracted a great deal of attention in marine circles.

Stranding of the s.s. Haulwen

The enquiry into the cause of the stranding of the British s.s. Haulwen in Montreal harbor, June 14, was held at Montreal, Aug. 4, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. F. Nash and J. O. Grey, as nautical assessors. The court found that the vessels' officers were altogether blameless in the matter and that the pilot was solely at fault, as there appeared to be no interference on the master's part. The court expressed the opinion that the grounding of the vessel, which caused no damage, was due to an error of judgment, but not a culpable one. The pilot was therefore censured for not adopting a proper course in anchoring his vessel in such a narrow channel with the current then running, by dropping the starboard anchor instead of the port one when he found the vessel going in the opposite direction to the one in which he wanted her

Atlantic and Pacific Ocean Marine.

The Dollar Steamship Co. has leased the Great Northern dock at Vancouver, B.C., for handling its trans-Pacific traffic.

The Cairn Line s.s. Fremona ran ashore on Anticosti Island, Aug. 1, and was released Aug. 21 and taken to Montreal.

The name of the s.s. Strathhardle, acquired recently by the Dollar Steamship Lines, Ltd., Victoria, B.C., has been changed to Harold Dollar.

Furness Withy & Co. are reported to have ordered six cargo steamships, each with a dead weight carrying capacity of 8,000 tons, for early delivery.

The s.s. William P. Edwards, until recently operated on the Great Lakes, which has been fitted for ocean service, is loading lumber at Montreal, for Ireland.

The Allan Line steamships Ionian and Scotian, which were requisitioned by the Admiralty in the early part of the war, have been released, and have returned to the Canadian service under Canadian Pacific Ocean Services, Ltd.

The s.s. Minnesota, owned by the Great Northern Pacific Steamship Co., is reported to have been sold to the United States Steamship Co., of which C. W. Morse, at one time President, Eastern Steamship Co., is President.

The New Zealand Shipping Co. has established a service between Wellington, New Zealand, and London, Eng., via the Panama Canal. This company, which also operates to Montreal, formerly ran its vessels round Cape Horn.

The White Star-Dominion Lines' steamships Canada, Northland and Southland, which were requisitioned by the Admiralty in the early stages of the war, for transport service, have been released, and have resumed service on the Canadian route.

A press report from London states that Furness, Withy & Co. has secured a majority interest in the Prince Line, Ltd., of Newcastle-upon-Tyne. The company owns 40 vessels ranging from 2,000 to 6,000 tons each, trading in various parts of the world.

The s.s. Matatua, which was in trouble on Mar. 12 and 13, at St. John, N.B., when fire broke out among her cargo, ran ashore in St. Mary's Bay, Newfoundland, towards the end of July. She is owned by Shaw, Savill and Albion Co., London, Eng., and is under charter by H. R. Goodday & Co., for a cargo of deals from Quebec to England.

List of Steam Vessels Registered in Canada During July, 1916.

No.	Name	Port of Registry	Where and When Built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
129491	A.E. McKinstry	Montreal	Glasgow, Scotland... 1910	250 4	42 7	18 3	1964	1203	150 sc.	Canada Interlake Line, Toronto
126199	E.A. Shores, Jr.	Windsor, Ont.	Cheboygan, Wis.... 1892	162 0	34 0	11 0	593	310	70 sc.	J. G. Mullen, Amherstburg, Ont.
119615	Meaford	Toronto	Wallsend, Eng.... 1903	248 9	42 0	20 6	1889	1210	225 sc.	Farrar Transportation Co., Toronto

List of Sailing Vessels and Barges Registered in Canada During July, 1916.

No.	Name	Port of Registry	Rig	Where and When Built	Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
139243	Asquith	Lunenburg, N.S.	Schr.	Bridgewater, N.S.... 1916	126 4	31 4	11 5	271	Asquith Shipping Co., Ltd., Lunenburg, N.S.
137842	Atanara	"	"	Mahone Bay, N.S.... 1916	102 6	26 2	10 2	96	J. Ernst & Son, Ltd., Mahone Bay, N.S.
137885	Doris L. Corkum	"	"	Shelburne, N.S.... 1915	109 0	26 2	10 6	99	Harold Corkum, LaHave, N.S.
118877	Donnacona Cornwall	Sydney	"	Burgeo, Nfld. 1901	105 0	25 6	10 4	129	Robert Moulton, Ltd., St. John's, Nfld.
138202	Edith M. Cavel	Shelburne	"	Shelburne, N.S.... 1916	107 2	26 2	10 4	134	George Penny, Ramea, Nfld.
138222	J. G. Rene	Montreal	Barge	Sorel, Que.... 1916	197 5	36 7	15 2	870	A. A. Larocque, Montreal.

The s.s. Glenellah, formerly operated on the Great Lakes, and which is now running in trans-Atlantic service, under the management of Furness, Withy & Co., sailed from Quebec about the middle of August, for England, with a cargo of 2,500 tons of Canadian whiskey.

The repairs carried out on the British s.s. Arachne, which ran ashore on Miquelon Island recently, and which were carried out at Levis, are reported to have cost \$55,000. The chief damage was in holds 1 and 2, where 72 plates were renewed.

A Vancouver press report states that Canadian Pacific Ocean Services, Ltd., has chartered the British s.s. Moskwa for service between Vancouver and Vladivostok. Considerable traffic is taking place between these two ports, and it is stated that the C.P.O.S. has under charter the steamships Unkia Maru 5, Strinda and Arabien, for this service.

The Japanese s.s. Kenkon Maru 3, which was floated off the Belle Chain reef, Mayne Island, recently, after being wrecked there, Jan. 12, was saved by the Vancouver Dredging and Salvage Co., and towed to Esquimalt for examination. The contract for repairing the vessel has been awarded to a Seattle firm, who have sublet it to one of the yards at Portland, Ore. The cost of the repairs is stated to be \$170,000, the work to be completed in 65 days. Temporary repairs to the hull were made at Esquimalt, and the vessel sailed for Portland, Aug. 2.

Canadian Pacific Ocean Services Ltd. has recently added a motor lifeboat of novel design to the life saving equipment of one of its steamships. It is 30 ft. long by 9 ft. broad by 4 ft. deep, and has a double skin of diagonal planking. The space below the water line is filled with air tanks, and extra buoyancy is obtained by means of a cork fender, while a cast iron keel makes the boat self righting. The engine is of the three cylinder type of 22½ h.p. developed on petroleum, and 25 h.p. on petrol. It can be started on paraffin and changed to petrol, or started on petrol and changed in three minutes to paraffin. All controls are led to a position aft of the watertight engine housing, and it can be operated by one man. A speed of 8 knots an hour can be obtained and there is a margin of power for towing other life boats.

12, was floated off on the following day, and sailed into Sydney under her own steam. She had a cargo of 10,000 tons of iron ore, a portion of which was jettisoned before she could be refloated.

A three masted schooner of 350 tons was launched at Lunenburg, N.S., at the end of July, for the Hillcrest Shipping Co. She is said to be the largest vessel of this type to be built in the neighborhood, and is to be engaged in the foreign shipping trade, under the management of Zwicker & Co.

The steamboat Mary Jane, which is being offered for sale, is owned by I. H. Mathers & Son, Halifax, N.S. She was built at Noank, Conn., in 1890, and is screw driven by engine of 10 n.h.p. Her dimensions are, length 49.8 ft., breadth 14.6 ft., depth 6.4 ft.; tonnage, 29 gross, 20 register.

The Department of Naval Service received tenders recently for the purchase of the three masted schooner Burleigh. She was built at Shelburne, N.S., in 1904, and is equipped with a 40 h.p. auxiliary gasoline engine. Her dimensions are, length 101 ft., breadth 25½ ft., depth 10 ft. 8 ins.; tonnage, 149 gross, 130 register.

The s.s. Lintrose, formerly owned by the Reid Newfoundland Co., and operated on the Sydney and Port aux Basques route, and which was sold to the Russian Government about a year ago, is reported to have been lost last winter in the White Sea. It is said that she ran on a rock, and when pulled off, sank in 18 fathoms of water.

The lightship on Lurcher Shoal, off Yarmouth, N.S., was removed during August for repairs. Pending their completion the station has been marked with a combined gas and whistling buoy, painted red, with an occulting white light, and a submarine bell buoy painted red. It is expected that the lightship will be replaced during September.

The s.s. Samuel Blandford, en route from New York to St. John's, Nfld., with coal, struck on the Main Keys at Cape St. Marys, Nfld., in a dense fog, early in August and became a total wreck. She was built at Quebec in 1872, as a private yacht for the Allan Line, and was later engaged in the mail service between

Halifax and St. John's, and again in the local seal fishery. About two years ago she was used in the coal trade, and was later acquired by Job Bros. & Co., and repaired and refitted for seal fishing.

The Montreal Transportation Co.'s s.s. Stormount, which stranded on Gull Ledge, near Marie Joseph, June 20, when en route from Philadelphia to Sydney, N.S., under charter to the Dominion Coal Co., has been abandoned, all efforts to release her having failed. She was built at Dumbarton, Scotland, in 1907, and was screw driven by engine of 202 n.h.p. Her dimensions were, length 249.1 ft., breadth 42.6 ft., depth 20.6 ft.; tonnage, 1,955 gross, 1,231 register. The Wreck Commissioner's judgment in the investigation relative to her loss was given in our last issue.

The Halifax Graving Dock Co.'s report for 1915 show a gross profit of £23,877 18s 6d, and there is an available balance of £21,669 5s 2d after providing for London office expenses, accrued income tax, etc. The balance has been disposed of as follows,—Depreciation £797 3s 7d, deferred maintenance £2,000, machinery renewal fund £1,000, provision for current income tax £2,049 7s. 2d. 7% debenture interest £9,141 13s 8d, mortgage debenture stock redemption fund £6,681 0s 9d. The report states that owing to the dock having been continuously occupied during the year, it was not possible to carry out certain repair work. They have therefore reserved out of the profits £2,000 for deferred maintenance. The negotiations with the Dominion Government concerning extensions to the property have been suspended owing to the war.

The Norwegian s.s. Borghild, which arrived at Halifax, N.S., Aug. 14, with the crew of the fishing schooner Oriole, which she sunk in collision, has been libelled by the owners of the schooner, and separately by the crew and the captain, on claims of \$26,000, \$10,000, and \$770 respectively, for loss and damages. Relatives of three members of the crew, whose lives were lost, also claim \$22,000.

The s.s. City of Ghent, registered as owned by W. A. Beattie, Pictou, N.S., is reported to have been sold to British parties for £700 more than she originally cost. She was built at Great Grimsby, Eng., in 1871, and is screw driven by en-

Maritime Provinces and Newfoundland.

An order in council has been passed approving amendments to the bylaws of the pilotage district of Miramichi, N.B., relating to pilotage dues.

The Maritime & Newfoundland Steamship Co. has libelled the s.s. Arachne, which stranded recently at Birds Rocks, Little Miquelon, for \$75,000 for salvage services.

The Reid Newfoundland Co., which is now operating the s.s. Sibyl on the Cabot Strait route, has had her equipped with wireless telegraphy, so that she will be able to carry passengers as well as mails and freight.

The Cupica Co., organized recently in St. John's, Nfld., has purchased the Norwegian auxiliary vessel Cupica, which is 226 ft. long, 36 ft. wide and 23 ft. deep, with a deadweight carrying capacity of 1,900 tons. She is equipped with twin cylinder auxiliary engine.

The Norwegian s.s. Sandefjord, which ran ashore at Sydney Mines, N.S., Aug.

Saulte Ste. Marie Canals Traffic.

The following commerce passed through the Saulte Ste. Marie Canals during July.

ARTICLES		CANADIAN CANAL	U. S. CANAL	TOTAL
Copper.....	Eastbound	Short tons 2,063	11,684	14,047
Grain.....	..	Bushels 7,092,623	6,256,490	13,349,113
Building stone.....	..	Short tons 508,750	964,471	1,473,221
Flour.....	..	Barrels 1,801,188	7,770,986	9,572,174
Iron ore.....	..	Short tons ..	2,800	2,800
Pig iron.....	..	.. ft. b.m. 483	52,604	53,087
Lumber.....	..	Bushels 12,899,570	19,008,233	31,907,803
Wheat.....	..	Bushels 7,384	37,009	44,393
General merchandise.....	..	Short tons 4,021	3,059	7,080
Passengers.....	..	Number ..	..	..
Coal, hard.....	Westbound	Short tons 9,780	157,180	166,960
Coal, soft.....	..	.. 170,080	6,190,882	2,360,962
Flour.....	..	Barrels 12,960	1,550	12,960
Grain.....	..	Bushels ..	19,266	19,266
Manufactured iron.....	..	Short tons 836	1,008	11,872
Iron ore.....	..	Short tons 10,894	75,482	86,376
Salt.....	..	Barrels 10,500	137,653	148,153
General merchandise.....	..	Short tons 58,320	3,551	61,871
Passengers.....	..	Number 3,892	..	3,892
SUMMARY		.....	.....	.....
Vessel passages.....	.....	Number 1,000	1,000	3,938
Registered tonnage.....	.....	Net 1,969,736	8,318,783	10,278,519
Freight—Eastbound.....	.....	Short tons 2,376,833	8,701,618	11,078,451
Westbound.....	.....	252,606	2,717,347	2,969,953
Total freight.....	.....	2,629,439	11,418,965	14,048,404

gine of 40 n.h.p., and her dimensions are, length 135.9 ft., breadth 20.4 ft., depth 9.7 ft., tonnage, 199 gross, 119 register. She has been lying idle at Halifax for about three years.

Province of Quebec Marine.

Work at the Davie dry dock and shipbuilding plant at Lauzon, was suspended, Aug. 16, owing to a strike of workmen, who demanded an increase of 5c an hour. The present rate of pay is 30c an hour.

The St. Charles Navigation Co., Ltd., has been incorporated under the Quebec Companies Act, with \$10,000 authorized capital and office at Quebec, Que., to own and operate steam and other vessels and to carry on a general navigation business.

The Quebec Shipbuilding & Repair Co., Ltd., has been incorporated under the Dominion Companies Act, with \$40,000 authorized capital, and office at Montreal, to carry on the business of shipbuilders, and in connection therewith to build, own and operate steam and other vessels, etc.

The Upper Ottawa Improvement Co.'s paddle wheel steamboat G. B. Greene was burned at her dock at Quyon, Que., July 27, four of the crew losing their lives. She was built at Quyon in 1896, and was equipped with engine of 125 n.h.p. Her dimensions were, length 142 ft., breadth 44.8 ft., depth 8 ft.; tonnage, 225 gross, 218 register.

The Dominion Government s.s. Montmagny, which was sunk in the St. Lawrence River, near the Isle of Orleans, about a year ago, has been sold by public tender, as she lies under water, to the St. Charles Navigation Co., incorporated recently at Quebec, for \$25,000. The Levis Wrecking Co. had a contract to raise the vessel some time ago, but the attempt was unsuccessful. When built, the Montmagny was valued at \$100,000.

Ontario and the Great Lakes.

The Dominion Public Works Department will receive tenders to Sept. 8, for repairs to the east pier at Port Burwell.

The Farrar Transportation Co., Ltd., Toronto, paid on Aug. 1 a special dividend of 20% from its operations to July 1.

The A. B. Mackay Steamship Co., Ltd., has been incorporated under the Ontario Companies Act, with \$40,000 authorized capital, and office at Hamilton, to take over two steamships acquired recently by A. B. Mackay, Hamilton.

A. B. Mackay, formerly of R. O. & A. B. Mackay, steamship owners, Hamilton, has purchased the s.s. Natironco, formerly Pioneer, built at Detroit, Mich., in 1892. She is equipped with engine of 146 n.h.p., driving a screw. Her dimensions are, length 225 ft., breadth 35 ft., depth 13.7 ft.; tonnage, 1,079 gross, 542 register. She was owned by the National Steamship Co., associated with the National Iron Works, Ltd., Toronto, but has been operated under Canada Steamship Lines management for some time.

The Lake Simcoe Navigation Co.'s s.s. Otonabee was burned and became a total loss, at Barrie, Aug. 15, when a considerable amount of damage was also done to the wharf and nearby buildings. The company owns and operates the steamboats Monarch and Otonabee, between Barrie and Peninsular Park, on Lake Simcoe. The Otonabee was built at Peterborough in 1907, and was screw driven by engine of 21 n.h.p. Her dimensions were, length

111.2 ft., breadth 24 ft., depth 5.6 ft., tonnage, 136 gross, 87 register. She was formerly owned by the Peterborough Navigation Co., Peterborough.

The U. S. Federal Court at Chicago, Ill., on Aug. 18, issued a temporary restraining order to prevent the sale of the nine vessels comprising the Great Lakes and St. Lawrence Transportation Co.'s fleet to the French Government. The complaint, on behalf of the Scranton Coal Co., stated that it was announced that five of the vessels were at Montreal waiting clearance papers for Havre, property of the French Government, and if this were permitted, the complainant would be without means to ship its coal. The company owns nine steel vessels, named A. D. Davidson, Albert M. Marshall, George G. Howe, H. G. Dalton, John Crerar, John Lambert, J. S. Keefe, Robert Wallace, and S. N. Parent.

It is announced that salvage work on the s.s. Charles S. Price, one of the steamships which was lost in Lake Huron in the great storm of Nov., 1913, has been definitely abandoned. It is stated that the man in charge of the preliminary operations has said that after having thoroughly explored the hull he was convinced that it would be impossible to float it without spending a very large amount, and there would be nothing but scrap to show for it. The interior of the vessel looks as though the boiler had exploded, the aft bulkhead is pushed forward and the machinery is wrecked and pushed towards the stern. The aft section is so badly damaged that it would be impossible to make any repairs under water. The aft and forward cabin sections are flat, and part of the machinery is resting on the lake bottom.

The Northern Navigation Co.'s s.s. Saronic was completely burned at Cockburn Island, Lake Huron, Aug. 21, when bound to Port McNicoll with a cargo of wheat. The crew escaped from the vessel in two boats. The Saronic was built at Sarnia, Ont., in 1882, and was formerly known as United Empire. The hull was of oak, and she was of the awning deck type, with two watertight and two non-watertight bulkheads, wooden arches, bow sheathed for ice, windlass between decks with no efficient bulkhead abaft same, and fitted with electric light. She was equipped with fore and aft compound engine with cylinders 34 and 60 ins. diam. by 42 ins. stroke, 1,200 i.h.p. at 75 r.p.m., and supplied with steam by two Scotch boilers 12 by 12 ft., at 100 lbs. Her dimensions were, length, 245 ft., breadth 36 ft., depth 23 ft., tonnage, 1,960 gross, 1,296 register.

The Plunkett Navigation Co., the incorporation of which was announced in recent issues, is operating the s.s. James W. Follette, formerly owned by W. H. Follette, Tonawanda, N.Y. She is in charge of Capt. Harry Redfern, with John McFaul as chief engineer. The officers of the company are: President, A. J. Plunkett; Vice President, G. J. Plunkett; Secretary-Treasurer and General Manager, G. J. Madden, Cobourg, Ont. The s.s. James W. Follette was built at Gibraltar, Mich., in 1881, and is of wood, with well deck, diagonal strapping on frames, wooden arches, iron lined boiler house, and was originally named Jesse H. Farwell. Her dimensions are, length 212 ft., breadth 35 ft., depth 12 ft.; tonnage, 756 gross, 538 register. She is equipped with fore and aft compound engine with cylinders 27 and 44 ins. diam. by 40 ins. stroke, 600 i.h.p., at 72 r.p.m., and supplied with steam by boiler of the firebox type 10 by 16 ft., at 125 lbs.

British Columbia and Pacific Coast.

The C.P.R. s.s. Princess Sophia has been overhauled and some general hull and engine room repairs made.

The C.P.R. s.s. Princess Victoria was docked at Esquimalt recently and thoroughly cleaned and painted and had a number of miscellaneous repairs carried out on her hull and engines.

The Pacific Coast Steamship Co.'s steamships Governor and President, which were withdrawn from service recently owing to the longshoremen's strike, resumed their calls at Victoria during August.

The contract for the construction of a concrete lighthouse tower, fog alarm building and dwelling house, at Triple Island, Brown Passage, is reported to have been awarded by the Marine Department to Snyder Bros. and Brethour, Vancouver.

The C.P.R. s.s. Princess Maquinna, which was docked at Esquimalt recently for survey and temporary bottom repairs, due to touching ground at the mouth of the Skeena river, has had a complete overhauling and two propeller blades replaced, and has returned to service.

The s.s. Turret Crown, owned by the Coastwise Steamship & Barge Co., Vancouver, and in operation between Tacoma, Wash., Vancouver and Anyox, was formerly owned by Mackenzie, Mann & Co. interests at Toronto, and was operated for some years in the lake trade, and latterly in the St. Lawrence and coast coal trade. She was delivered to her present owners at Quebec in Nov., 1915, and was then overhauled and equipped as an oil burner at Perth Amboy, N.J. Before going to the Pacific coast she was under charter in the sugar trade between New York and the West Indies. She was built at Sunderland, Eng., in 1895, and is screw driven by engine of 250 n.h.p. Her dimensions are, length 253 ft., breadth 44 ft., depth 19.4 ft.; tonnage, 1,827 gross, 1,142 register.

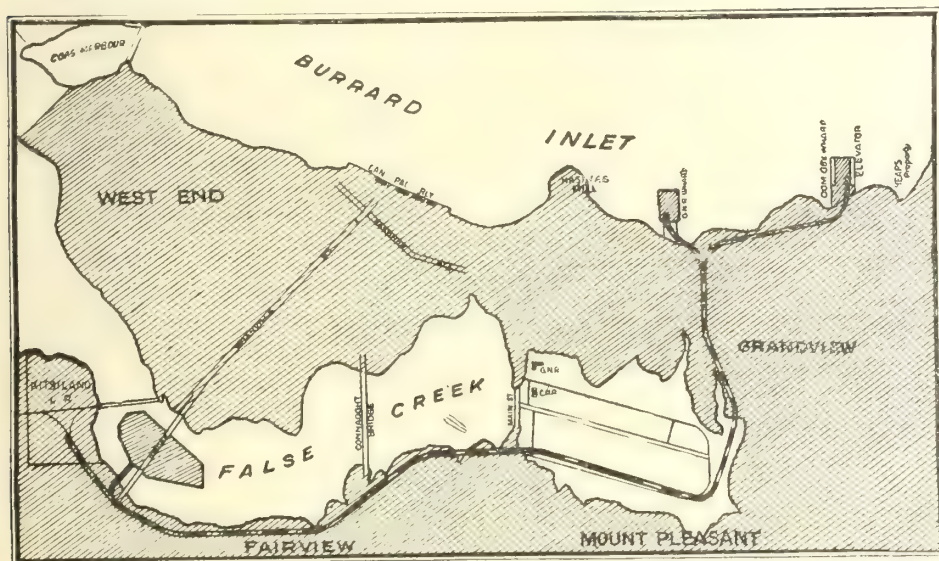
It is reported that such progress has been made on the outer harbor works at Victoria, that it is probable the work will be completed by the end of the year. Divers are working on the submarine foundations of the last length of 85 ft. of the breakwater. The construction of the pier to the westward of the breakwater, at Ogden Point, is also being hurried along. Of the total of 53 crib sections required for this structure, 42 have been laid, and the remainder, it is expected, will be laid by the end of October. Within the next few weeks the construction of the superstructure on piers 2 and 3 will be commenced, and the piers will probably be completed early in the new year. The contractors for the breakwater are Sir John Jackson (Canada) Ltd., and for the piers, Grant Smith & MacDonnell Ltd.

Vessels Turning in the Rivers at Fort William.—This matter, reference to which was made in our August issue, has been followed up by the Dominion Marine Association, with the view of showing that the order compelling vessels to go into one of the turning basins at Fort William, when making a turn, works an unnecessary hardship on canal sized vessels, without corresponding advantage. The question is being considered by officers of the departments concerned, but for the present they have recommended that the regulation stand unchanged, so that all steamships over 200 tons must go to the turning basins.

Harbor Improvement Scheme at Vancouver.

The Vancouver Harbor Commissioners have outlined a scheme of improvement for Vancouver harbor, extending over five years, at an estimated expenditure of \$5,000,000. Among the properties which it is stated it would be necessary to acquire to carry out the scheme, are, the Kitsilano Indian reserve, 80 acres, \$700,000; property at Port Moody, 88 acres, \$550,000; the Heaps property on Burrard Inlet, 16½ acres, \$650,000; right of way for a harbor terminal railway from the Kitsilano Indian reserve to the Heaps property, \$1,552,861; a portion of the Pacific Great Eastern Ry. right of way, \$516,627; and wharf property and warehouses owned by the Great Northern Ry., and the waterfront property immediately east of the G.N.R. property, \$1,800,000. The approximate total cost of the property thus to be acquired is \$5,769,128. It is expected that the Harbor Commissioners will be able to effect exchanges for other lands which they hold, thus reducing the cost to approximately \$2,448,834. By the issue of \$5,000,000 bonds, it is es-

The Harbor Commission was incorporated May 16, 1913, with jurisdiction over the harbor, which includes Burrard Inlet, with the North Arm and Port Moody, False Creek and English Bay, and all other tidal waters east of a line drawn from the Point Atkinson lighthouse southerly to the most westerly point of Point Grey. The commission consists of C. Carter-Cotton, Chairman, formerly editor of the News-Advertiser, salary, \$2,000; J. A. Fullerton, formerly in C.P.R. service in connection with its trans-Pacific steamships; and S. McClay, interested in the stone business, salary, each, \$1,500. Early in 1914, the commission's bylaws were approved by the Governor General in council. They authorized the commission to make certain charges against vessels using the port. Prior to this, Vancouver had been practically a free port, apart from certain charges claimed that they had no prior knowledge of the charges to be imposed, nor



Map of Proposed Terminal Railway for Vancouver Harbor.

timated that approximately \$1,500,000 will be available for the development of the harbor properties and the provision of facilities. The proposal and plans were submitted to the Marine Department and the scheme has been recommended for approval, and the commissioners are confident that it will be self supporting from the start. Some opposition to the scheme has developed, it being urged that the commissioners have not given the public necessary information, nor the time to think over the proposal. On behalf of the opposition, which consists chiefly of the Board of Trade, the Manufacturers Association and the shipping interests in general, it is urged that it will impose a heavy burden on the port and that it will not pay, and that the prices mentioned for the properties proposed to be acquired are far too high. The commissioners argue that each unit of the scheme will be revenue producing, that the project will not come on the port, that the prices quoted for properties are maximum estimates, and that actual prices paid will be lower. The accompanying plan shows the route of the proposed harbor terminal railway along the front connecting the Kitsilano reserve with the Heaps property.

any opportunity to express their views thereon. The charges for the port of Vancouver are as follows:—

Pilotage in and out \$1 per ft. and 1c. a ton; sick mariners' dues at 1½c. a net registered ton, five times a year; harbor dues 3c. a net registered ton, five times a year.

These rates worked out for a specific vessel, show charges of \$239 for Vancouver, and the following for two other Canadian ports and three U.S. ports,—Quebec, \$354.94; Montreal, \$479.94; San Francisco, \$625.20; Portland, Ore., \$483.20, and Seattle \$455.95.

Some figures as to the tonnage handled at Vancouver show that for the year ended Mar. 31, the total tonnage paying wharfage was somewhat under 300,000 tons, compared with about 500,000 tons for the year ended Mar. 31, 1913, and that on the 1916 figures the commissioners are not justified in proceeding with such a large scheme. The commissioners are firm in the idea that they should plan for the future, and that in a short time sufficient shipping will come through the port to justify new piers and warehouses, and also that the provision of cheap industrial sites will attract manufacturers, all of which will be in the interests of the port.

Stranding of the s.s. Tyne.

An investigation into the causes of the stranding of the British s.s. Tyne on Twelve Foot Patch, Old Proprietor Island, Grand Manan, N.B., July 23, was held at St. John, N.B., recently, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. A. J. Mulcahy and Jas. Hayes, as nautical assessors. The court found that the master, H. W. Robson, did not adopt all the prudence required in navigating his vessel, taking into consideration the fact that he was a stranger to those waters and that he sailed from a port outward bound with a state of atmosphere which prevented him from seeing a very great distance and, owing to the direction of the wind, he should have anticipated that it would become denser. He committed two grave errors of judgment, first, left port without streaming his log, no matter what its condition, and second, in assuming that he was a mile or mile and a half off Ile Haute when he passed it. Some time before the stranding, a cast of the lead showed 100 fathoms, a few hours later 27 fathoms were found, and the vessel proceeded at half speed until another cast of the lead showed 8 fathoms, when she was stopped although the engines were not reversed. The master erred greatly in not going full speed astern the moment he found 27 fathoms, which indicated that the water was shallowing rapidly. It was felt that the master's certificate should be dealt with, but after taking into consideration the honesty displayed in giving his evidence, as it was quite apparent that he did not endeavor to hide any particulars or any of his shortcomings, and the able manner in which he succeeded in getting his vessel off the rocks, from which few vessels have hitherto escaped after striking, and also considering the shortage of masters and officers under present conditions, the court thought the justice of the case would be met by reprimanding and severely censuring the master for failing to adopt the precautionary measures mentioned, and did not attach any blame to the officers.

Stranding of the s.s. Middleham Castle.

The stranding of the British s.s. Middleham Castle on Matane reef, Que., July 27, was enquired into at Montreal, Aug. 3, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. F. Nash and J. O. Grey, as nautical assessors. After hearing the evidence the court expressed itself as handicapped, owing to existing conditions, in dealing with the certificate of the master, J. A. Kelly, with the severity the case demanded, and concluded the judgment as follows:— "Here we have a master ordered to come to Canadian waters, which are absolutely unknown to him. He stopped at Sydney, where he endeavored to secure some charts, but obtained for navigating his ship up the River St. Lawrence a chart of American publication. Without any sailing directions, not conversant with the tides and currents prevailing in this river, he ventured to sail his vessel within ¼ mile of head lands, which are really low points of land the same as other points along his course, which the court considers a foolhardy operation, and otherwise termed too close sailing. This ship is ready to sail, in fact, the sailing date has been delayed for this investigation to be held. If the court carried out its impression it would suspend the mas-

ter's certificate for two months for this reckless navigation; but by doing so it would expose the vessel to some delay in obtaining another master, and it would appear that the masters available today may not think fit to take command of this vessel, which is bound to a place in Europe with a cargo consigned to the Admiralty, containing provisions or ammunition for the Allies. This peculiar position prevents the court from acting as it would otherwise do, and therefore it will meet the situation as it is by severely censuring the master for venturesome navigation in unknown waters, without having first surrounded himself with the necessary information. The Third Officer, who was on the bridge at the time, is exonerated from all blame, as he took the courses from the master. The court has noted that the log books have been well kept, and noticed as well that the compass was increasing its error on the courses being steered, for some time past, which should have awakened the master to the necessity of giving the coast line on these courses a wider margin. With this reprimand goes the caution to the master to be more prudent and not hazard property entrusted to his care in the manner in which he did in this instance."

Telegraph, Telephone and Cable Matters.

The Great North Western Telegraph Co. has been ordered by the Board of Railway Commissioners to restore telegraph tolls charged prior to July 1, from Pas, Man., and to file amendment to its tariff accordingly.

The Marconi Wireless Telegraph Co. has established a school of wireless telegraphy at Montreal, equipped with a complete dummy system arranged for a radius of 400 miles. It is in charge of D. P. R. Coats, who has had considerable experience as a Marconi operator.

The Western Union Telegraph Co.'s new cable repair vessel, Lord Kelvin, was at Halifax, N.S., recently, on her first trip to that port. She is of the most modern type for her class of work, burns oil fuel, and is equipped with the most up to date machinery for locating, raising and testing cables.

The arbitration board appointed to deal with the Great North Western Telegraph Co.'s operators' application for increases of wages of about 15%, is as follows:—Judge C. T. Snider, chairman; F. H. McGuigan, Toronto, formerly Vice President, G.T.R., representing the company, and D. Campbell, Winnipeg, on behalf of the operators.

A. C. Fraser, Superintendent of Telegraphs, Eastern Lines, C.P.R., who was in Halifax, N.S., recently, is reported to have stated that the C.P.R. had completed a new copper line to the Marconi station at Louisburg, thus giving the company a new line for Marconi business. from Louisburg to Montreal, the one used previously for this traffic being released for other business.

It is reported that the Dominion Government has engaged P. E. Edelman, St. Paul, Minn., to prepare plans for wireless telephone and telegraph systems to secure communication with the Dominion parks in the west. The installations will, it is said, be the first of their kind, and a new application of radio communication, the equipment being of a special design adapted for the difficult mountain service.

The Great North Western Telegraph Co. has opened offices at Little Metis Beach, Manoir Richelieu, Pointe au Pic,

and Perthuis, Que.; Barriefield Camp, Bobcaygeon, Chaffey's Locks, Dwight, Grimsby Beach, Kemptville, Lake Joseph, Milford Bay, Muskoka Lakes, Petewawa Camp, Rosseau, Royal Muskoka Hotel and Sparrow Lake, Ont., and Sangudo, Alta. The offices at St. Andre de Kamouraska, Que., Colebrook, Ont., and Brule Lake and Cardiff, Alta., have been closed.

A. G. Saylor, General Manager, Eastern Division, Western Union Telegraph Co., New York, New York, who retires Sept. 1, on pension, was born at Bloomfield, Ont., June 11, 1859, and entered Dominion Telegraph Co.'s service at 10 years of age, as a messenger at Ingersoll, Ont. Two years later he was appointed operator at Walkerton, Ont., and after a year of service with the Montreal Telegraph Co. at the Parliament Buildings and at the Montreal main office, he was appointed night operator, G.T.R., at Portland, Me. He subsequently entered the Atlantic & Pacific Telegraph Co.'s service, and later joined the Western Union Telegraph Co., and remained there until his retirement. He was appointed General Superintendent, Eastern Division, Mar. 1, 1910, and the title was shortly after changed to General Manager.

Marconi Wireless Telegraph Co's Annual Meeting.

The report for the year 1915, presented at the recent annual meeting in London, Eng., showed that there was no change in the capital stock since the previous year. Bills payable and sundry creditors showed a reduction of about £8,000 and £16,000 respectively, and the general reserve account stood at £967,530 0s 6d, an increase of about £100,000. Other increases were, cash at bankers, £20,000; investments and temporary loans, £173,500; sundry debtors, debit balances and expenditures on foreign developments, £23,000; shares in associated companies and patents £23,000. The shares appear in the balance sheet at cost, but have a par value of £2,484,369 14s 10d. The profit and loss account shows the balance of contracts, sales and trading account, to be some £210,000 more than in the preceding year, and the net profit £377,817 12s 1d, an increase of some £145,000. The amount written off for depreciation of exchanges and investments was £53,000. Business during the year can scarcely be considered as normal. A considerable amount of work should have been undertaken in various parts of the world, but for the war, but against this

there were many additional orders from British and allied countries. On account of the war, the associated companies have not been able to make the progress which they otherwise would have done. The trans-Atlantic service with the United States, which was ready for working when war commenced, has had to continue idle, the British stations remaining under Government control. The programme in connection with the Canadian company has had to remain in abeyance. During the war, the British Government has made considerable use of the company's patents, compensation for which will be matter for negotiation, as also will be compensation for the use of stations and the system generally.

During the year, G. Marconi, G.C.V.O., has been engaged in research work in Italy, where he carried out some important improvements and tests. The results obtained were far reaching and directly concerned with the future practice of wireless telegraphy and wireless telephony over long and short distances, no matter whether conducted by means of ordinary sparks, quenched sparks or continuous waves, and it is believed that results hitherto impossible will be obtained. It was officially announced that in the near future he will introduce a new, independent and very simple installation, to be worked from the bridge of a ship, which will put an end to all danger of collision at sea in darkness or fog.

A dividend of 5% less income tax was declared payable on ordinary shares, Aug. 1, to shareholders of record on June 29.

Transportation Conventions in 1916.

- Sept. 5 to 8.—Traveling Engineers' Association, Chicago, Ill.
- Sept. 12-14.—Master Car and Locomotive Painters' Association of United States and Canada, Atlantic City, N.Y.
- Sept. 12-14.—Railway Signal Association, Mackinac Island, Mich.
- Sept. 19-22.—Roadmasters and Maintenance of Way Association, New York.
- October 3-5.—Railway Fire Protection Association, New York.
- Oct. 9-13.—American Electric Railway Association, Atlantic City, N.J.
- October 10.—Association of Manufacturers of Chilled Car Wheels, New York.
- Oct. 17, 18.—American Association of Passenger Traffic Officers, Washington, D.C.
- October 17-19.—American Railway Bridge and Building Association, New Orleans, La.
- October 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Philadelphia, Pa.
- Oct. 18-20.—Society of Railway Financial Officers, Washington, D.C.
- Oct. 19-21.—American Association of Dining Car Superintendents, New Orleans, La.



Showing the construction of our geared jacks.

Celebrated "H & E" Lifting Jack

Our Patent Ball-Bearing Geared Jacks are Ideal in Railroad and Heavy Construction Work.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

SHERBROOKE, QUE.

Sole Agents for Brakeshoes for Canada outside of B.C., Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for B.C., The B.C. Equipment Co., Vancouver, B.C. Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.

High Grade Electric
STEEL CASTINGS
MANGANESE STEEL
For Crusher Jaws and Heavy
Wear Parts

BRONZE

M.C.B. Standard Journal Bearings and Engine Bearings

Improved Reinforced Steel-Backed

BRAKESHOOES

Locomotive Driver and Truck Shoes. Freight and Passenger Car and Electric Car Shoes.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated:

Canadian Car Service Bureau—W. J. Collins, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.

Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Associations—E. de la Hooke, London, Ont.

Dominion Marine Association—F. King, Counsel, Kingston, Ont.

Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.

Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.

Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.

Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.

International Water Lines Passenger Association—M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee—James Morrison, Montreal.

Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.

Quebec Transportation Club—A. F. Dion, Quebec.

Shipping Federation of Canada—Thos. Robb, Manager, 42 St. Sacramento Street, Montreal.

Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.

Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.

Transportation Club of Vancouver—H. W. Schofield, 553 Granville St., Vancouver, B.C.

Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.

Western Canada Railway Club—Louis Kon, Box 1707 Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Winnipeg Traffic Club—James Gehrey, Bannatyne Avenue, Winnipeg, Man.

Wartenfels-Lucille M. Schnare Collision.—At the recent investigation at Quebec, Que., into the collision between the British s.s. Wartenfels and the schooner Lucille M. Schnare, near Cape Pine, Nfld., June 18, Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Commander E. G. V. Elliott, R.N.R., and Lieutenant J. A. Murray, R.N.R., found, after a careful analysis of the evidence, that there was no cause for condemning either side, and that the collision was, under the circumstances, unavoidable, and no blame could be attached to anyone for its happening.

CANADIAN PACIFIC RAILWAY CO.

Notice to Shareholders.

The Thirty-fifth Annual General Meeting of the Shareholders of this Company, for the election of Directors to take the places of the retiring Directors and for the transaction of business generally, will be held on Wednesday, the fourth day of October next, at the principal office of the Company, at Montreal, at Twelve o'clock noon.

The Common Stock Transfer Books will be closed in Montreal, New York and London at 3 p.m. on Friday, the first day of September. The Preference Stock Books will be closed in London at the same time.

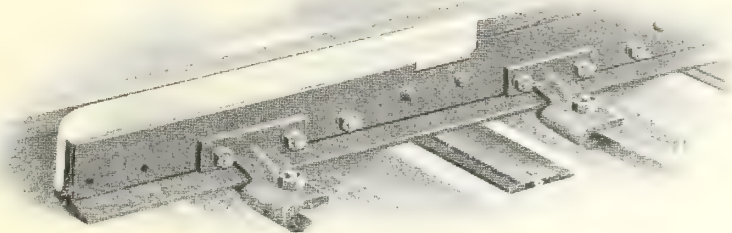
All books will be re-opened on Thursday, the fifth day of October.

By order of the Board,

W. R. BAKER,

Secretary.

Montreal, August 14th, 1916.



Ramapo Manganese Reinforced Switch Point

Note that the Switch Rail is continuous to the end of the Switch, leaving no joint to work loose. This construction in hard service will outwear all rail point five to one.

Canadian Ramapo Iron Works Limited

NIAGARA FALLS

ONTARIO

“Claude” Oxygen Oxy-Acetylene

WELDING AND CUTTING PLANTS

MADE IN CANADA

All large railway shops are applying our systems to numerous uses. Welding frames, building up tires, boiler patches, welding flues. Also for cutting up scrap.

Cut out coupon for interesting booklet.

L'Air Liquide Society

Three Canadian Distributing
Stations

26 Boler Street, West Toronto
325 William Avenue, Winnipeg
Maisonnette, Montreal

L'Air Liquide Society, Maisonneuve,
MONTREAL, P.Q.

Gentlemen,—Will you please send, without obligation to me, postpaid, your New Booklet?

Name

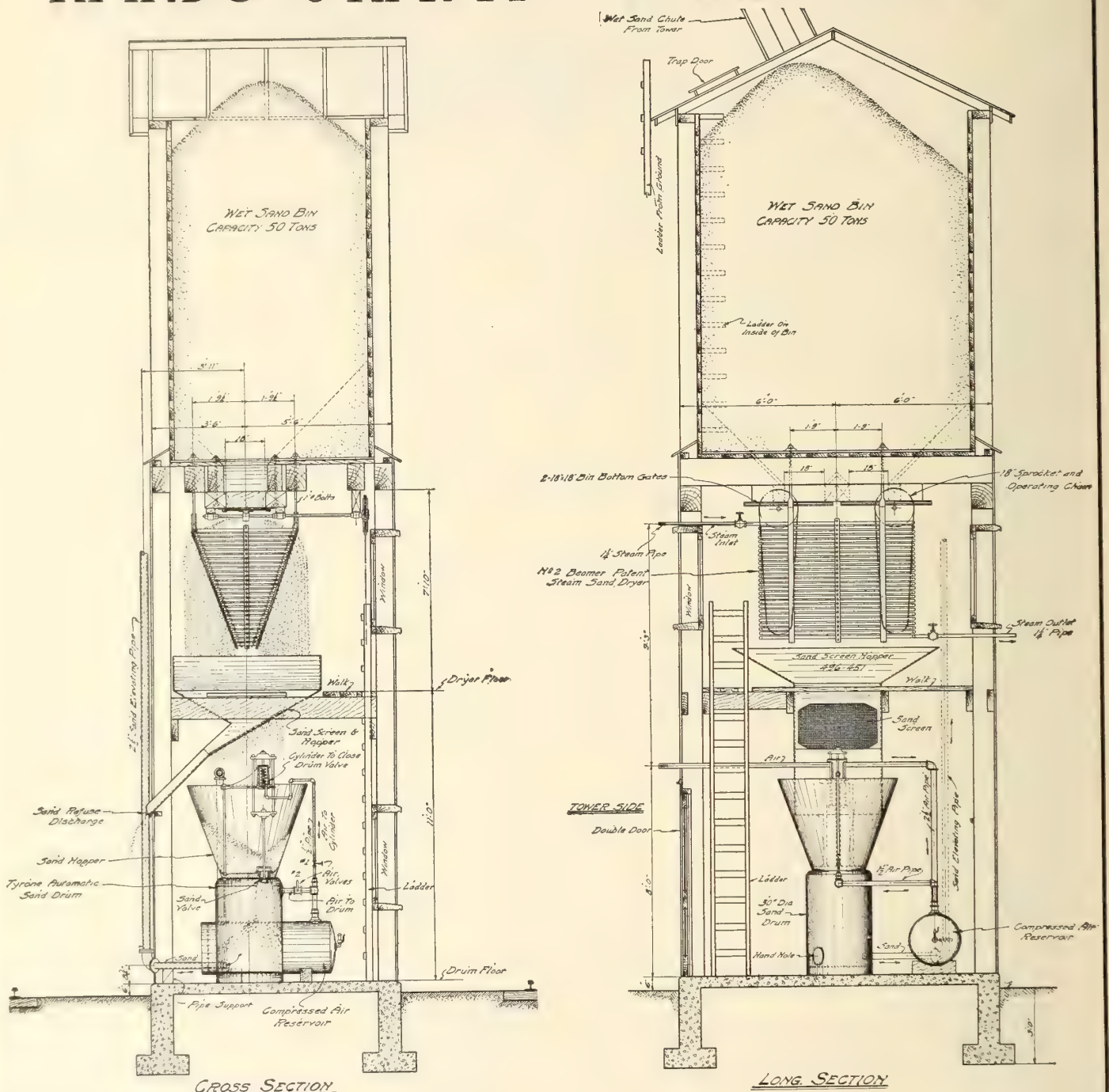
Address

Province Date

Business

R & M

RANDS GRAVITY SAND PLANT



Design copyrighted Feb., 1915.

Occupies area 9 ft. x 12 ft. and may thus be installed between receiving track and coaling track of the Coaling Plant. Green sand is dumped in receiving hopper in the same manner as coal and hoisted in elevating bucket and discharged direct by gravity into a 50-ton wet sand bin. Green sand then flows direct to "Beamer" Patent Steam Sand Dryer, which will hold damp sand but will not hold dry sand. By our system sand is dumped, elevated, stored, dried, dry sand elevated and placed on locomotives without being touched by hand or shovel. Eliminating labor greatly reduces cost of handling per ton. Investigate the "Beamer" Sand Dryer.

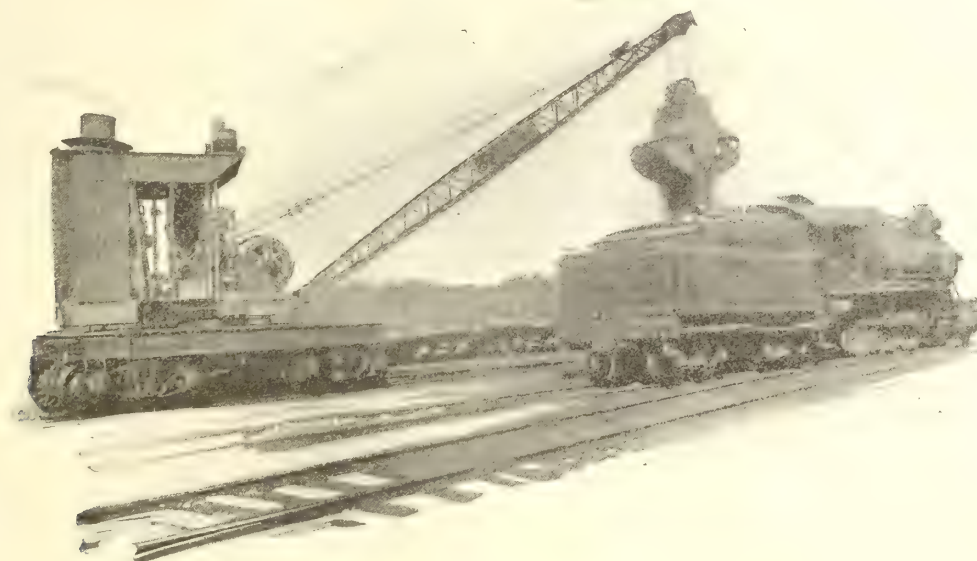
ROBERTS AND SCHAEFER CO.

ENGINEERS AND CONTRACTORS
CHICAGO, U. S. A.

"Fulfill the Contract"

"Satisfy the Client"

BROWNHOIST



A Saving of \$2400 a Year

THE men on one of the large railroads wanted a locomotive crane at their terminal. They wanted this crane to coal their locomotives, load the cinders and handle the stationary coal. This work was being done by hand, and the engines were being coaled from a mechanical chute. This road uses Brownhoist Locomotive Cranes at several points and the operating men knew just what it would cost to do their work with a Brownhoist Crane. And they also knew what it was costing to do the work in the old way. The following are the railroad's figures:

Yearly cost for doing the work in the old way	- - -	\$6885.65
Yearly cost for doing the work with Brownhoist Crane		\$4430.00
Saving	- -	\$2455.65

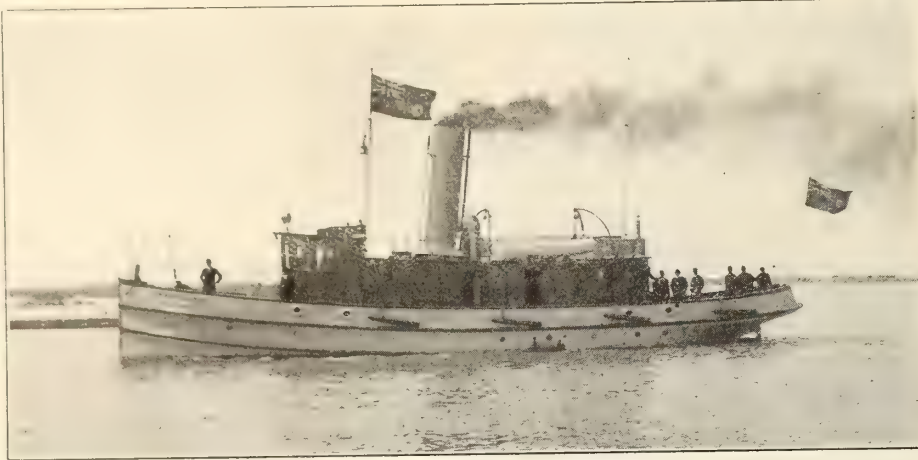
What a Brownhoist Locomotive Crane will do and where it is being used are shown in our Catalog I. This catalog will be sent to any one upon request.

The BROWN HOISTING MACHINERY Co.
CLEVELAND, OHIO

MONTREAL OFFICE, 145 St. James Street

STEEL SHIPBUILDERS

Engineers and Boilermakers



Steel Tug "Fredericton" built for the Dominion Government, 80 feet length, 20 feet breadth, 10 feet draught, compound marine engine, 12 x 26 x 18, clyde boiler 10 feet x 11 feet, 145 lbs. steam.

Dredges, Hydraulic
and Dipper Type;
Steel Steamers, full
Canal Size; Tugs,
Barges and Scows.

Marine Engines
and Boilers,
all Sizes

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto

RESULTS COUNT

That's Why 480 Railroad Shops Are Using Thermit

Thermit offers the only sure and reliable repair for locomotive frames and other heavy sections.

The superheated liquid Thermit steel is produced in bulk and poured all at once into a mold surrounding a broken section, resulting in the perfect amalgamation of the Thermit steel with the parts with which it comes in contact. The fact that those parts are first preheated, makes the weld doubly sure.

The operation of welding locomotive frames is easily accomplished, without removing the frame from position, and with very little dismantling, no matter if the frame be broken in the splice, jaw, next to the cylinder saddle, or at any other point. The engine is returned to service in from ten to twelve hours.

Hundreds of thousands of pounds of Thermit are being used annually by railroad companies in the United States and Canada.

There is only one reason for this, and that is that Thermit produces results and we all know that "results count."

Our pamphlet No. 2144 will be of interest.

All Thermit and Thermit appliances are made in our Canadian shops.

GOLDSCHMIDT THERMIT COMPANY

103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco. Equitable Bldg., 120 Broadway, New York

7300 So. Chicago Ave., Chicago



Brake Shoe Scrap Reduced To The Absolute Minimum



The Reinforced Brake Shoes here pictured were all worn down practically to the steel back.
 The average weight of 100 shoes taken at random from this pile was about 5½ lbs.
 The roads using these shoes received about twice as much brake shoe service as could have been gotten from ordinary unreinforced shoes. It paid them and it will pay your road to use Reinforced Brake Shoes.

Manufactured in Canada.

Dominion Brake Shoe Company, Limited

350-356 St. James Street, MONTREAL

The Holden Co., Ltd., Agents



"You Get The Job"

"We've been watching you, young man. We know you're made of the stuff that wins. The man that cares enough about his future to study an I. C. S. course in his spare time is the kind we want in this road's responsible positions. You're getting your promotion on what you *know*, and I wish we had more like you."

The boss can't take chances. When he has a responsible job to fill, he picks a man *trained to hold it*. He's watching *you* now, hoping you'll be ready when the opportunity comes.

The thing for you to do is to start today and train yourself to do some one thing better than others. You can do it in spare time through the International Correspondence Schools. Over 5000 men reported advancement last year as a result of their I. C. S. training.

The first step these men took was to mark and mail this coupon. Make *your* start the same way—and make it right now.

I. C. S., Box 8408, Scranton, Pa.



"MR. OWNER," said the Architect to his client, "the walls and floors of this building of yours will be concrete—and they will be waterproof, too. I have specified

R.I.W. TOXEMENT
 REMEMBER IT'S WATERPROOF
 PATENTED

R.I.W. Toxement is a dry powder, added in small quantities to the Portland Cement. It lubricates the concrete and waterproofs it against the fiercest driving storms—even against water pressure. It waterproofs reinforced concrete factories, piers, bulkheads, chimneys, tanks, dams, bridges, walls, etc., etc.

Those interested in any form of concrete construction should read our "Toxement Booklet." Address Dept. 56.

Manufactured in Canada by

**R. I. W. DAMP-RESISTING PAINT CO.
 TOCH BROTHERS**

Gerrard St. and Carlaw Ave.
 TORONTO, ONTARIO, CANADA

INTERNATIONAL CORRESPONDENCE SCHOOLS Box 8408, SCRANTON, PA.

Explain, without obligating me, how I can qualify for the position, or in the subject, before which I mark X.

- | | |
|--|--|
| <input type="checkbox"/> Locomotive Engineer | <input type="checkbox"/> R. R. Agency Accounting |
| <input type="checkbox"/> Locomotive Fireman | <input type="checkbox"/> R. R. Genl. Office Accounting |
| <input type="checkbox"/> Traveling Engineer | <input type="checkbox"/> Bookkeeper |
| <input type="checkbox"/> Traveling Fireman | <input type="checkbox"/> Stenographer and Typist |
| <input type="checkbox"/> Air Brake Inspector | <input type="checkbox"/> Higher Accounting |
| <input type="checkbox"/> Air Brake Repairman | <input type="checkbox"/> Mathematics |
| <input type="checkbox"/> Round House Foreman | <input type="checkbox"/> Good English |
| <input type="checkbox"/> Trainmen and Carmen | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> Railway Conductor | <input type="checkbox"/> Advertising Man |
| <input type="checkbox"/> Mechanical Engineer | <input type="checkbox"/> Civil Service |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> Railway Mail Clerk |
| <input type="checkbox"/> Machine Shop Practitioner | <input type="checkbox"/> Electrical Engineer |
| <input type="checkbox"/> Boiler-Maker or Designer | <input type="checkbox"/> Electrician |
| <input type="checkbox"/> Steam Engineer | <input type="checkbox"/> Electric Wiring |
| <input type="checkbox"/> Steam-Electric Engineer | <input type="checkbox"/> Electric Lighting |
| <input type="checkbox"/> Civil Engineer | <input type="checkbox"/> Telegraph Expert |
| <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> Mine Foreman or Engineer |
| <input type="checkbox"/> R. R. Constructing | <input type="checkbox"/> Metallurgist or Prospector |
| <input type="checkbox"/> Bridge Engineer | <input type="checkbox"/> Chemical Engineer |
| <input type="checkbox"/> Architect | <input type="checkbox"/> Agriculture |
| <input type="checkbox"/> Architectural Draftsman | <input type="checkbox"/> Spanish |
| <input type="checkbox"/> Contractor and Builder | <input type="checkbox"/> Poultry Raising |
| <input type="checkbox"/> Structural Engineer | <input type="checkbox"/> Automobiles |
| | <input type="checkbox"/> French |
| | <input type="checkbox"/> Auto-Repairing |
| | <input type="checkbox"/> Italian |

Name _____
 Occupation _____
 & Employer _____
 Street _____
 and No. _____
 City _____ State _____
 If name of Company, give full name of Company and address.

Thor

Reversible, Pneumatic Wood-Boring Machines

Three sizes—with capacity up to 4". This is size AW boring $3\frac{1}{4}$ " holes for car floor washers. These Drills are also successfully used by shipyards for all wood-boring and general timbering about the stocks or launching ways.

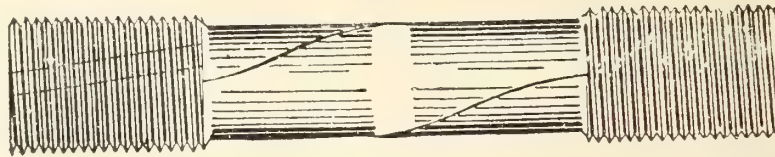
SHIPPED ON TRIAL—FREE.

Independent Pneumatic Tool Company
334 St. James St., Montreal, Que.



American Flexible Staybolts

Manufactured in Montreal

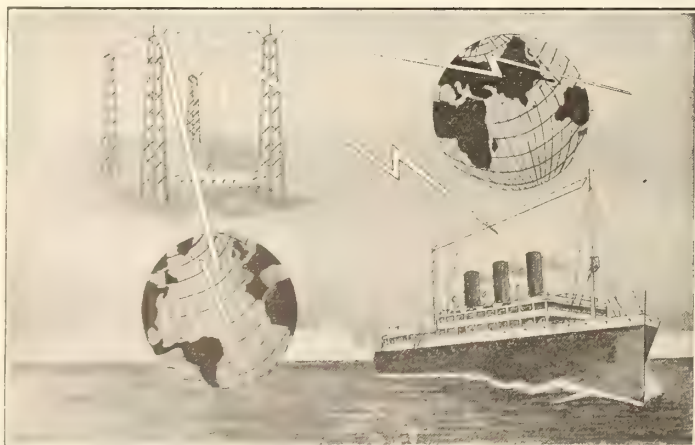


Made of the best standard staybolt iron, adding flexibility by process of making as shown above---closely approximating a rope structure.

Write for booklet on subject.

TAYLOR & ARNOLD, Limited
MONTREAL WINNIPEG

CONSULT "MARCONI"



THE WORLD WIDE WIRELESS

MARCONI WIRELESS

A Wireless Equipment on your vessel is a safeguard against **LOSS OF LIFE, PROPERTY** and **TIME**.

THE CHEAPEST FORM OF MARINE INSURANCE

We maintain an expert organization of engineers and operators who are at your service.

Consult us on all matters pertaining to wireless.

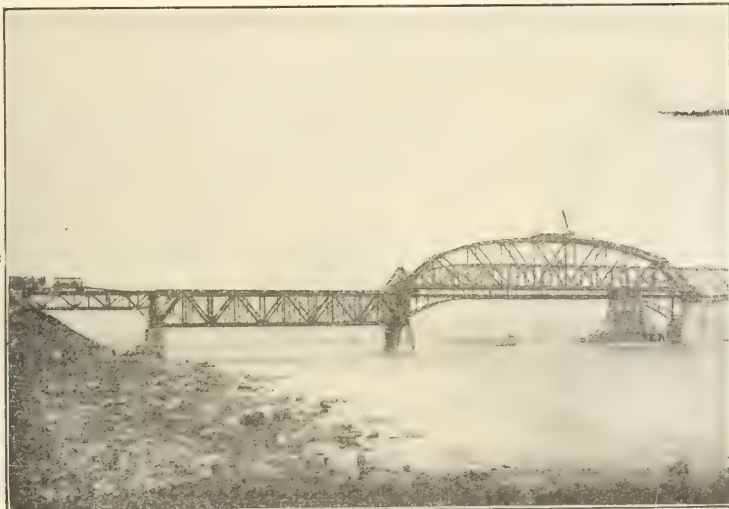
Canadian Marconi Company

137 McGill Street, MONTREAL

Dominion Bridge Company, Limited

Head Office and Works,
MONTREAL, P.Q.

Branch Offices and Works,
TORONTO, OTTAWA and WINNIPEG



Lachine Bridge

Engineers, Manufacturers and Erectors of Steel Structures.
CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

Large Stock of Standard Structural Material at all Works.

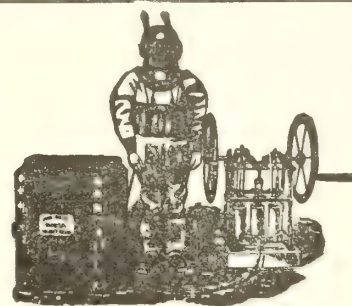
John Morrow Screw & Nut Co.,
Limited.

BUSINESS AS USUAL

Set Screws
Cap Screws
Nuts, every variety
of finish
Twist Drills, etc.

Customers are requested to place their specifications with us as far ahead of their actual needs as possible so that we may give them good service.

INGERSOLL - ONTARIO



JOHN DATE

Manufacturer of

Diving Apparatus

For Sale or Hire

Brass Founder and Coppersmith
13-15 Concord St., Montreal

Which Method

prevails in your plant? Does it take two men to do one man's work.

Why don't you replace that old antiquated tool with a new up to date

Reece's New Screw Plate

These pictures do not exaggerate conditions as you can actually see them, if you will visit Machine Shops throughout the country.

Lessen your cost by giving your mechanics a REECE'S NEW SCREW PLATE.

Butterfield & Co., Inc.
Rock Island, Que.



Insist on having

DREWRY'S
American
STYLE RICE
BEER

The best beer—
without exception

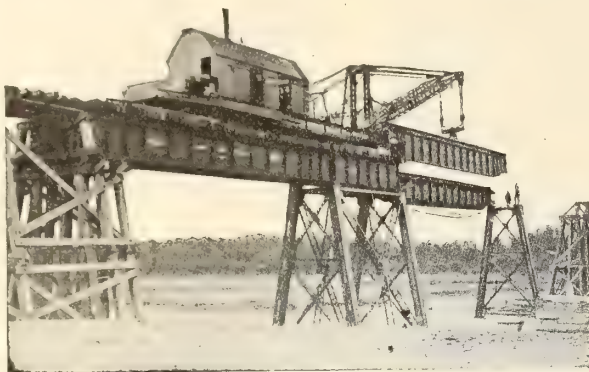
E. L. Drewry, Ltd., Winnipeg

**FOR TICKET CASES AND
COMMERCIAL FURNITURE**

of all descriptions to stock
or special design, apply to
The Canadian Office and School Furniture Co.
Limited
Preston - Ontario

"BEATTY" HOISTS

For situation where the work is severe and the service exacting—"a Beatty always fills the bill"



Derrick car engined with an 8 x 12 four drum Beatty Hoist placing an 80 foot deck plate girder span in Skugog River Bridge.

Let us know your requirements for
Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

We will gladly send full information.

M. Beatty & Sons Limited - Welland

Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg, Winnipeg.

Hunt-Spiller Gun Iron

IN

Locomotive Castings

SAVES MONEY

INCREASES: Engine Efficiency—Engine Mileage.

DECREASES: Engine Failures—Engine Repairs.

MADE ONLY BY

Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.

J. G. Platt,
Sales Manager.

Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.

The Ottawa Car Manufacturing Co., Limited

Builders of

Electric Cars, Snow
Sweepers and Plows

Also

Producers of Brass
Castings of Every
Description.

Slater Street - Ottawa

Ontario Jockey Club TORONTO

Autumn Meeting

September 23rd to 30th

Racing Steeplechasing

General Admission \$1.50

JOS. E. SEAGRAM W. P. FRASER
President Sec'y-Treas.

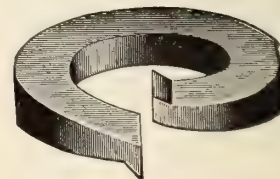
Electric Railway Supplies

Detroit Controller Checks.
Peerless Check Valves.
Hollis Safety Fender.
Bakalite Arch-leaves, Brush holders
Yokes and Rods.
Bakalite Washers and Asbestos
Board.
Gongs, Bells and Air Whistles.

Allen General Supplies, Ltd.
205 Yonge Street Toronto

The Positive Lock Washer

is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks

The Positive Lock Washer Co.
Sole Mfrs., Newark, N.J.

F. H. HOPKINS & CO., Agents, Montreal

Engineers and Contractors

THE ARNOLD COMPANY

ENGINEERS—CONSTRUCTORS.
ELECTRICAL—CIVIL—MECHANICAL
REPORTS, DESIGN AND CONSTRUCTION
Complete Railway Shop and Terminal Properties—
Electrification of Steam Railroads.
OUR EXPERIENCE COVERS THIRTY-FIVE PLANTS
Chicago, Illinois.

ANGUS SINCLAIR, C.E.

Railway Contractor

Office: Imperial Bank Building,
King and Sherbourne Sts., Toronto.

Locomotive COALING STATIONS

ROBERTS AND SCHAEFER CO.

ENGINEERS AND CONTRACTORS
CHICAGO, U.S.A.

Edward F. Terry
President

Frederick Tench
V. P. & Treas.

The TERRY & TENCH CO., Inc.

Bridge Builders

General Contractors, Engineers and Designers
Grand Central Terminal NEW YORK

Patent Solicitors

PATENTS

HERBERT J. S. DENNISON

Mechanical Engineer, Patent Attorney and Expert.
Patents, Trade Marks, Designs, Copyrights, and
Infringements. 20 Years experience in Patents
and Practical Engineering.

Star Building, 18 King Street West, Toronto
WRITE FOR BOOKLET.

PATENTS SECURED OR OUR FEES RETURNED.

Being next door to the Patent Office; we have personal interviews with Examiners, thus earlier allowance of your Patents. We have access to all Records and solicit the business of Manufacturers, Engineers and others who realize the advisability of having their Patent business transacted by Experts.

HAROLD C. SHIPMAN & CO.
Reg. Patent Attorneys. Ottawa, Canada

**CANADIAN PACIFIC RAILWAY CO.
Dividend Notice.**

At a meeting of the Board of Directors held today the following dividends were declared:

On the Preference Stock, two per cent. for the half year ended 30th June last;

On the Common Stock, two and one-half per cent. for the quarter ended 30th June last, being at the rate of seven per cent. per annum from revenue and three per cent. per annum from Special Income Account.

Both dividends will be paid on 30th September next to Shareholders of record at the closing of the books in Montreal, New York and London at 3 p.m. on Friday, 1st September next.

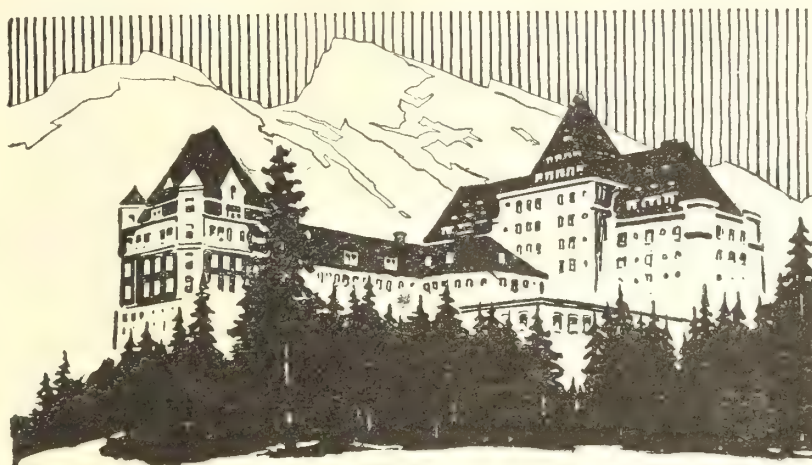
All books will be reopened on Thursday, 5th October next.

By order of the Board,

W. R. BAKER,

Secretary.

Montreal, 14th August, 1916.



Minarets and Mountain Peaks

at luxurious Banff—in the very heart of the

Canadian Pacific Rockies

At Banff are all the fine touches of social life, good table, good service, every possible comfort at moderate cost. From the stone pillared verandah or from the wide windows of the hotel, lies spread the great panorama of Alps and river.

Reached only by the world's greatest transportation system—the

Canadian Pacific Railway

which maintains hotels at Banff, Lake Louise, Field, Glacier, Balfour.

Everything Canadian Pacific Standard—None Better.

For further information apply to
any Canadian Pacific Ticket
Agent or W. B. Howard, District
Passenger Agent, Toronto.



ROBERT W. HUNT
THOS. C. IRVING JR.

CHARLES WARNOCK
JAS. W. MOFFAT

Robert W. Hunt & Co., Limited

**Consulting and Inspecting Engineers
Chemists and Metallurgists**

Expert examination and tests of all steel and metal products;
Bridges, Buildings, Cement; Electrical and Mechanical Plant
Equipment; Rails and Fastenings; Cars; Locomotives; Pipe;
Castings; Forgings; Lumber; Paving Materials.

Resident inspectors at all important manufacturing centres in
Canada, the United States and Great Britain.

REPORTS ON PROPERTIES AND PROCESSES.

Head Office and Laboratories:

McGill Building,

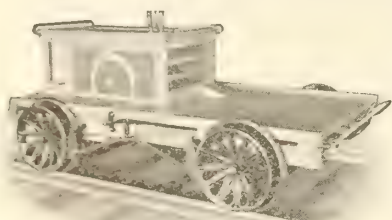
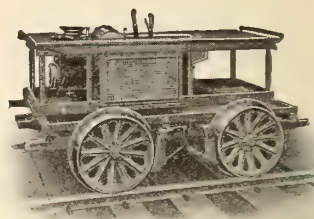
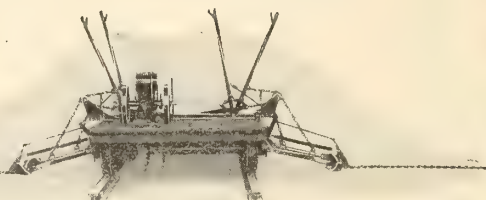
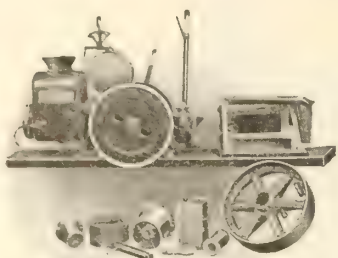
MONTREAL, QUE.

Branches: TORONTO

VANCOUVER

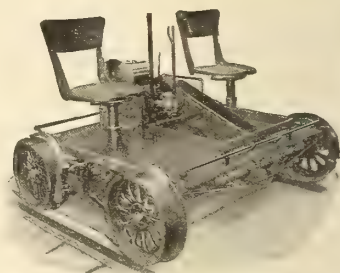
LONDON, ENGLAND

FAIRMONT WINS GOLD MEDAL



The excellence of FAIRMONT Railway Motor Cars is attested by their receiving the highest competitive award, a gold medal, at the Panama-Pacific International Exposition, San Francisco.

Years of good service on Canadian railroads has proven the justice of this award. When you need a motor car, specify "FAIRMONT". Installation terms to private buyers.



FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

Formerly Fairmont Machine Co.

445 N. MAIN ST., FAIRMONT, MINNESOTA, U.S.A.

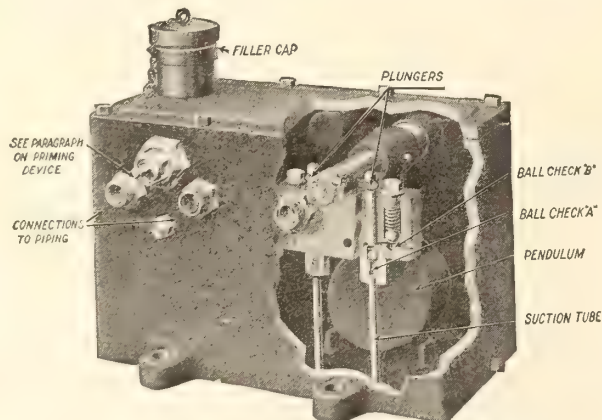
A PROPHECY

"Experience indicates that the delivery of a proper lubricant to the flange will reduce the wear of both flange and rail."

That was the prophesy of the Flange Committee of the M.C.B. in 1911.

FULFILLED

Experience secured by a large number of railway officials through the installation of the



Detroit Automatic Flange Lubricator (Pendulum Type)

has fulfilled this prophesy made over five years ago, and demonstrated that the Detroit Automatic Flange oiler gives efficient flange lubrication just when needed. These men know what this has meant to their roads, in greater tire mileage and reduced danger of derailment.

Booklet FO-75 will show what it will mean to you. Send for it today.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.

WALKERVILLE, ONT.

Makers of the Stewart Carburetor.

Rails, Cars, Locomotives

and Contractors' Equipment

IMMEDIATE
SHIPMENT

John J. Gartshore
58 Front St. West
TORONTO

Consolidated

The ORIGINAL electric heater. Patented ventilated core. Glazed. Patented return lead with connections at one end. Light pressed steel construction. Rust-proofed. In use on 70,000 out of 90,000 cars now operating.

Consolidated Car-Heating Co.
New York — Albany — Chicago
DAWSON & CO., Agents, MONTREAL

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies.

AERATED WATERS

E. L. Drewry
AIR BRAKES AND FITTINGS
 Canadian Westinghouse Co.

AXLES

E. L. Drewry
ANGIE BARS
 Steel Co. of Canada

AUTOMOBILES

Preston Car & Coach Co.

AXLES

Nova Scotia Steel and Coal Co.
 Jas. W. Pyke & Co.
 Steel Co. of Canada.

BATTERIES, DRY

Canadian National Carbon Co.

BATTERIES, SIGNAL

Canadian National Carbon Co.

BATTERIES, STORAGE

Canadian National Carbon Co.

BATTERIES, TRACK

Canadian National Carbon Co.

BATTERY SUPPLIES

Canadian National Carbon Co.

BOILER COMPOUND

Dearborn Chemical Co. of Canada

BOILERS

M. Beatty & Sons
 F. H. Hopkins & Co.
 Polson Iron Works

BOILERS, PORTABLE

Polson Iron Works

BOILERS, STATIONARY AND MARINE

Polson Iron Works

BOILERS, STEAM

Polson Iron Works

BOILERS, WATER TUBE

Babcock & Wilcox

BOLTS AND NUTS

Steel Co. of Canada

BOLTS, TRACK

F. H. Hopkins & Co.
 Nova Scotia Steel & Coal Co.
 Steel Co. of Canada

BORERS, CAR WHEEL

John Bertram & Sons Co.
 Canada Machinery Corporation

BRAKE BEAMS

Buffalo Brake Beam Co.

BRAKE SHOES

Canada Iron Foundries
 Canadian Brakeshoe Co.
 Dominion Brakeshoe Co.

BRAKE SHOES, LOCOMOTIVE DRIVER

Canada Iron Foundries

BRIDGE BUILDERS

Terry & Tench Co.

BRIDGE NUMBERS

Acton Burrows, Limited

BRIDGES

Canadian Bridge Co.
 Dominion Bridge Co.

BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION

Canadian National Carbon Co.

BUCKETS, COAL, ORE AND CONCRETE

M. Beatty & Sons
 Brown Hoisting Machinery Co.
 F. H. Hopkins & Co.

BUILDINGS, STEEL

Canadian Bridge Co.
 Dominion Bridge Co.

BUMPING POSTS

F. H. Hopkins & Co.

CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED

Standard Und. Cable Co. of Can.

CARBONS, ARC LAMP, FLARE ARC AND PHOTOGRAPHIC

Canadian National Carbon Co.

CARBON SPECIALTIES

Canadian National Carbon Co.

CAR CLEANER

Allen General Supplies, Ltd.

CAR SIGNAL SYSTEMS

Ohio Brass Co.

CARS

Eastern Car Co.
 Hart-Otis Car Co.
 National Steel Car Co.
 Ottawa Car Mfg. Co.
 Preston Car & Coach Co.

CASTINGS, BRASS

Canada Iron Foundries
 Canadian Bronze, Limited

CASTINGS, CAR

Canada Iron Foundries
 Dominion Brakeshoe Co.

CASTINGS, IRON

Canada Iron Foundries
 Hunt-Spiller Manufacturing Corp.

CASTINGS, IRON AND STEEL

Dominion Brakeshoe Co.
 Dominion Steel Foundry Co.

CASTINGS, MALLEABLE

Taylor & Arnold

CASTINGS, MANGANESE STEEL

Canadian Steel Foundries, Ltd.

CASTINGS, STEEL

Dominion Steel Foundry
 Joliette Steel Co.

CATENARY MATERIALS

Ohio Brass Co.

CHAINS

B. J. Coghlin Co.
 F. H. Hopkins & Co.

CLOSETS, CAR

Dunier Co.

COAL

Nova Scotia Steel and Coal Co.

COAL CHUTES

Roberts & Schaefer Co.

COAL DOCK BRIDGES

Roberts & Schaefer Co.

COAL MINING AND WASHING PLANTS

Roberts & Schaefer Co.

COALING STATIONS

Roberts & Schaefer Co.

COMPRESSORS, AIR

Canadian Ingersoll-Rand Co.

CONCRETE MIXERS & ROCK CRUSHERS

F. H. Hopkins & Co.

CONTRACTORS' SUPPLIES

F. H. Hopkins & Co.

CONVEYORS, COAL AND ASH

Babcock & Wilcox

COPPER, RODS AND WIRE

Standard Und. Cable Co. of Can.

COUPLERS, CAR & LOCOMOTIVE

Canadian Steel Foundries, Ltd.

CRANES

Ohio Brass Co.
 Taylor & Arnold

CRANES, ELECTRIC

Babcock & Wilcox
 Dominion Bridge Co.
 F. H. Hopkins & Co.

CRANES, TRAVELLING

F. H. Hopkins & Co.

CROWBARS

B. J. Coghlin Co.

CULVERTS

Pedlar People, Ltd.

CURTAINS AND FIXTURES, CAR

Du Pont Fabrikoid Co.
 Preston Car & Coach Co.

CUTS

Acton Burrows, Limited

DERRICKS

M. Beatty & Sons
 F. H. Hopkins & Co.

DIES

Butterfield & Co.

DITCHERS

M. Beatty & Sons
 F. H. Hopkins & Co.

DIVING OUTFITS

John Date
 F. H. Hopkins & Co.

DOOR SIGNS

Acton Burrows, Limited

DRAFT GEAR

Standard Coupler Co.

DREDGES

M. Beatty & Sons
 F. H. Hopkins & Co.
 Polson Iron Works

DRILLS

Canadian Ingersoll-Rand Co.
 John Morrow Screw & Nut Co.

DRILLS, AIR

F. H. Hopkins & Co.
 Independent Pneumatic Tool Co.

DRILLS, RADIAL

Canada Machinery Corporation

DRILLS, VERTICAL

Canada Machinery Corporation

DRILLS, WELL

F. H. Hopkins & Co.

DUMP CARS, CONTRACTORS'

Hart-Otis Can. Co.

DYNAMO AND ELECTRIC CASTINGS

Dominion Brakeshoe Co.

ECONOMIZERS

Babcock & Wilcox

ELECTRIC CAR ROUTE SIGNS

Acton Burrows, Limited

ENAMELED IRON SIGNS

Acton Burrows, Limited

ENGINEERS

Arnold Co.
 Roberts & Schaefer Co.
 Angus Sinclair & Co.

ENGINES, AUTOMATIC

Polson Iron Works

ENGINES, HOISTING

M. Beatty & Sons
 Canadian Ingersoll-Rand Co.

ENGINES, STATIONARY AND MARINE

Polson Iron Works

EXPRESS OFFICE SIGNS

Acton Burrows, Limited

FARE BOX HOLDERS

Coleman Fare Box Co.

FARE BOXES, P.A.Y.E. OPERATION

Coleman Fare Box Co.

FARE BOXES, PORTABLE AND STATIONARY

Coleman Fare Box Co.

FILES

Nicholson File Co.

FORGINGS

Nova Scotia Steel & Coal Co.
 Steel Co. of Canada

FROGS

Canadian Ramapo Iron Works

GAUGE COCKS

Ohio Brass Co.

GAUGES, LOCOMOTIVE

Taylor & Arnold

GEARS AND PINIONS

Allen General Supplies, Ltd.

GRATES, SHAKING

Babcock & Wilcox
 Polson Iron Works

HAMMERS, CAST STEEL

Dominion Brakeshoe Co.
 F. H. Hopkins & Co.

HANDCARS

F. H. Hopkins & Co.
 Rice Lewis & Sons

HANGERS, CABLE

Standard Und. Cable Co. of Can.

HEADLIGHTS

Ohio Brass Co.

HEATING, CAR

Chicago Car Heating Co.
 Consolidated Car Heating Co.

HOISTS, PNEUMATIC

Taylor & Arnold

HOISTS, STEAM

M. Beatty & Sons

HOOKS

Steel Co. of Canada

HOPPERS, CAR, WET OR DRY

Dunier Co.

ILLUSTRATIONS

Acton Burrows, Limited

INSPECTIONS

R. W. Hunt & Co.

INSULATORS, PORCELAIN

Ohio Brass Co.

INSURANCE, ACCIDENT

Imperial Guar. & Acc. Ins. Co.

INTERLOCKING PLANT AND SIGNALS

Canadian Steel Foundries, Ltd.
 Gen. Railway Signal Co. of Can.

IRON AND STEEL BARS

Steel Co. of Canada

IRON SIGNS

Acton Burrows, Limited

IRON, PIG

Nova Scotia Steel and Coal Co.
 Steel Co. of Can.

JACKS

Canadian Brakeshoe Co.
 Canadian Steel Foundries, Ltd.
 F. H. Hopkins & Co.
 A. O. Norton, Limited

JOURNAL BEARINGS

Canadian Bronze, Limited
 Jas. W. Pyke & Co.

LAGGING AND COVERING, LOCOMOTIVE

Taylor & Arnold

LAGER BEER, ETC.

E. L. Drewry

LAMPS AND LANTERNS

F. H. Hopkins & Co.
 The Hiram L. Piper Co.

LAMPS, INCANDESCENT

Canadian Westinghouse Co.

LATHES

John Bertram & Sons Co.
 Canada Machinery Corporation

LIGHTS, CONTRACTORS' AND WRECKING

F. H. Hopkins & Co.

LINE MATERIAL

Ohio Brass Co.

LOCOMOTIVES, CONTRACTORS'

Canadian Locomotive Co.
 Montreal Locomotive Works
 F. H. Hopkins & Co.

LOCOMOTIVES, ELECTRIC

Montreal Locomotive Works

LOCOMOTIVES, LOGGING

F. H. Hopkins & Co.
 Montreal Locomotive Works

LOCOMOTIVES, RACK

Montreal Locomotive Works

LOCOMOTIVES, STEAM

F. H. Hopkins & Co.
 Montreal Locomotive Works

LORRIES, TRACKLAYING

F. H. Hopkins & Co.

LUBRICATORS

Canadian Detroit Lubricator Co.
 Taylor & Arnold

MACHINES AND PLANT, CONTRACTORS'

M. Beatty & Sons
 F. H. Hopkins & Co.

MACHINES, BORING AND TURNING

John Bertram & Sons Co.
 Canada Machinery Corporation

MACHINES, CAR SHOP

Steel Castings



High-grade Open Hearth Steel Castings up to five tons. Our new plant is now in operation and we are in a position to quote best prices and early delivery.

Write your requirements or send patterns. Our policy is to give our patrons service.

Joliette Steel Company

Limited

Main Office
903 Read Bldg., Montreal

Works at
Joliette, Que.

The Preston Car & Coach Co., Limited

Preston, Ont.

Manufacturers of
Steam and Electric
Railway Cars and
Special Cars.

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Celebrated Wheel Truing Brake Shoe. Best Wheel Grinders in the World.

Car Closets

Flush or Dry

DUNER CO. 101 S. CLINTON ST. CHICAGO

VESSEL FOR SALE.

Steel hull former side-wheel passenger steamer "Picton," in first class condition; hold clear and decked over; all machinery removed; carrying capacity approximately 600 tons. Length 190 ft.; breadth moulded 28 ft.; depth moulded 13 ft.; draught forward 3 ft., draught aft 4 ft. Low price for quick sale. Apply Lake Simcoe Ice Supply Co., Ltd., Toronto.



NICKEL

Shot—High and low carbon.

Ingots—Two sizes, 25 lbs., 50 lbs.

Electrolytic Nickel—99.80 p.c.

Prime Metals for the Manufacture of Nickel Steel, German Silver, Anodes and all remelting purposes. Our Nickel is produced as Rods, Sheets, Strip Stock, Wire and Tubes.

We are SOLE PRODUCERS of this natural stronger-than-steel, non-corrodible alloy. Manufactured forms are Rods, Flats, Castings, Tubes, Sheets, Strip Stock and Wire.

Send Inquiries Direct to Us.

The International Nickel Co., 43 Exchange Place, N.Y.

MONEL
METAL
Reg. U.S. Pat. Off.

Sessions-Standard Friction Draft Gear

Simplest and Best

Both
Made by

Standard Coupler Co.
30 CHURCH STREET, NEW YORK

Standard Steel Platforms

Used by all Canadian Railways

C. W. Sherman, Pres. and Gen. Mgr.

F. W. Ballie, Vice-Pres.

A. G. Wright, Secy.

Dominion Steel Foundry Company, Limited, Hamilton, Ont.

Locomotive Frames

Car Bolsters

Car Castings

Heavy Machinery Castings

CHICAGO CAR HEATING CO.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES

Canadian Factory and Office—61 Dalhousie St., Montreal

GENERAL OFFICES:

RAILWAY EXCHANGE, CHICAGO, U.S.A.
NEW YORK, GRAND CENTRAL TERMINAL BLDG.
ATLANTA GA., CANDLER BLDG.
WASHINGTON, D.C., MUNSEY BLDG.

A. D. BRUCE, Agent

MACHINES, TRACKLAYING

F. H. Hopkins & Co.
MACHINES, WOOD AND IRON WORKING

Canada Machinery Corporation

MACHINE TOOLS

John Bertram & Sons Co.
Canada Machinery Corporation
Pratt & Whitney Co.

MANHOLE FRAMES & COVERS

Canada Iron Foundries
Dominion Brakeshoe Co.

MARINE PAINTS AND VARNISHES

Toch Bros.

MARINE REPAIRS

Goldschmidt Thermit Co.

MARINE SUPPLIES

Rice Lewis & Sons

METALS

Goldschmidt Thermit Co.

METAL WORK, STRUCTURAL

Canadian Bridge Co.

Dominion Bridge Co.

Jas. W. Pyke & Co.

MILEPOST NUMBERS

Acton Burrows, Limited

MONEL METAL

International Nickel Co.

MOTOR CARS

Fairmont Gas. Eng. and Ry.

Motor Car Co.

MOTORS, TURNTABLE

Taylor & Arnold

NAILS, CUT AND WIRE

Steel Co. of Canada

NICKEL, SHEET, ROD, WIRE & TUBE

International Nickel Co.

NICKEL, METALLIC SHOT & INGOTS

International Nickel Co.

NUMBERS

Acton Burrows, Limited

NUT LOCKS

Positive Lock Washer Co.

OFFICE FITTINGS

Can. Office & School Furn. Co.

OFFICE SIGNS

Acton Burrows, Limited

OILS

Galena-Signal Oil Co.

Imperial Oil Co.

PACKING

Canuck Supply Co.

Garlock Packing Co.

PAINTS

Toch Bros.

PATENT ATTORNEYS

H. J. S. Dennison

H. C. Shipman & Co.

PILE DRIVERS, RAILWAY

F. H. Hopkins & Co.

PIPE, STEAM

Babcock & Wilcox

PIPE STOCKS

Butterfield & Co.

PIPE, WROUGHT, LEAD AND GALVANIZED

Steel Co. of Canada

PLANERS

John Bertram & Sons Co.

Canada Machinery Corporation

PLATFORMS, STEEL

Standard Coupler Co.

PLOUGHS, CONTRACTORS'

F. H. Hopkins & Co.

PORTER

E. L. Drewry

PUMPS

F. H. Hopkins & Co.

PUMPS, CENTRIFUGAL

M. Beatty & Sons

F. H. Hopkins & Co.

R. D. Wood & Co.

PUNCHES AND SHEARS

Canada Machinery Corporation

PUTTY

Steel Co. of Canada

RAIL BONDS

Ohio Brass Co.

Elec. Railway Improvement Co.

RAIL BENDERS

Canadian Steel Foundries, Ltd.

RAIL JOINTS

Goldschmidt Thermit Co.

The Rail Joint Co. of Canada

RAILS, NEW

Algoma Steel Corporation

Dominion Iron & Steel Co.

J. J. Gartshore

F. H. Hopkins & Co.

RAILS FOR RELAYING

J. J. Gartshore

Jas. W. Pyke & Co.

RAILWAY SUPPLIES

Franklin Railway Supply Co.

F. H. Hopkins & Co.

Rice Lewis & Sons

The Hiram L. Piper Co.

REAMERS

Butterfield & Co.

REPLACERS, CAR AND LOCOMOTIVE

F. H. Hopkins & Co.

RIVETS

Steel Co. of Canada, Ltd.

RIVETTERS

Canadian Ingersoll-Rand Co.

ROCK CRUSHERS

F. H. Hopkins & Co.

ROPES, DERRICK

Dominion Wire Rope Co.

ROOFING, CAR

Franklin Railway Supply Co.

F. H. Hopkins & Co.

RUBBER GOODS

Can. Consolidated Rubber Co.

SANDERS, PNEUMATIC

Ohio Brass Co.

SAWS, HACK

Diamond Saw & Stamping Co.

SCOWS, DUMP AND DECK

M. Beatty & Sons

SCREW PLATES

Butterfield & Co.

SCRAPERS, WHEEL AND DRAG

F. H. Hopkins & Co.

SCREWS, WOOD AND MACHINE

John Morrow Screw and Nut Co.

Steel Co. of Canada

SEMAPHORE ARMS

Acton Burrows, Limited

SHEET PILE DRIVERS

Canadian Ingersoll-Rand Co.

SHIPS

Polson Iron Works

SIGNAL HOUSE NUMBERS

Acton Burrows, Limited

SIGNALS

Gen. Railway Signal Co. of Can.

The Hiram L. Piper Co.

SIGNS

Acton Burrows, Limited

SNOW PLOUGHS

F. H. Hopkins & Co.

SPIKES, RAILWAY, SHIP OR PRESSED

Nova Scotia Steel and Coal Co.

Steel Co. of Canada

SPICING TUBES AND COMPOUNDS

Standard Und. Cable Co. of Can.

SPREADER CARS

F. H. Hopkins & Co.

SPRINGS

Canadian Steel Foundries, Ltd.

B. J. Coghlin & Co.

SPRINKLERS, ELECTRIC

Preston Car & Coach Co.

STAPLES

Steel Co. of Canada

STATION NAME SIGNS

Acton Burrows, Limited

STAYBOLT IRON

Taylor & Arnold

Trolley Supply Co.

STAYBOLTS, FLEXIBLE

Flannery Bolt Co.

STAYBOLTS, LOCOMOTIVE

Flannery Bolt Co.

STAYBOLT TAPS

Butterfield & Co.

STEAM HAMMERS

John Bertram & Sons Co.

STEAM SHOVELS

M. Beatty & Sons

F. H. Hopkins & Co.

STEAMSHIP SIGNS

Acton Burrows, Limited

STEEL

Nova Scotia Steel and Coal Co.

STEEL, FIRE BOX

Taylor & Arnold

Canadian Steel Foundries, Ltd.

STEEL FOR AXES

Canadian Steel Foundries, Ltd.

STEEL FOR SAWS

Canadian Steel Foundries, Ltd.

STEEL FOR TIRES

Steel Co. of Canada

STEEL SHAFTING

Nova Scotia Steel and Coal Co.

STEEL PLATES

Jas. W. Pyke & Co.

STEEL, TOOL

Canadian Steel Foundries, Ltd.

F. H. Hopkins & Co.

STOKERS, MECHANICAL

Babcock & Wilcox

STRAINERS

Babcock & Wilcox

SUPERHEATERS

Babcock & Wilcox

Locomotive Superheater Co.

SWITCH TARGETS

Acton Burrows, Limited

SWITCHES

Canadian Ramapo Iron Works

TACKS

Steel Co. of Canada

TANKS AND TANK FIXTURES

F. H. Hopkins & Co.

Polson Iron Works

TAPS

Butterfield & Co.

TELEGRAPH AND TELEPHONE OFFICE SIGNS

Acton Burrows, Limited

TERMINALS, JUNCTION BOXES

Standard Und. Cable Co. of Can.

THERMIT

Goldschmidt Thermit Co.

TIE PLATES

Algoma Steel Corporation

B. J. Coghlin

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

TICKET CASES

Canadian Office & School Fur. Co.

TIRES, STEEL

Jas. W. Pyke & Co.

TOOLS AND SUPPLIES

F. H. Hopkins & Co.

Pratt & Whitney Co.

TOOLS, CAST STEEL

Dominion Brakeshoe Co.

TOOLS, TRACK

John Bertram & Sons Co.

Canadian Steel Foundries, Ltd.

B. J. Coghlin Co.

F. H. Hopkins & Co.

TOOLS, PNEUMATIC

Canadian Ingersoll-Rand Co.

Independent Pneumatic Tool Co.

TRAMWAY EQUIPMENT

J. J. Gartshore

TRACK EQUIPMENT

Canadian Ramapo Iron Works

F. H. Hopkins & Co.

TROLLEY BASES

Allen General Supplies, Ltd.

Ohio Brass Co.

TROLLEY CATCHERS

Allen General Supplies, Ltd.

Ohio Brass Co.

Trolley Supply Co.

TROLLEY GUARDS

Ohio Brass Co.

Trolley Supply Co.

TROLLEY RETRIEVERS

Allen General Supplies, Ltd.

Ohio Brass Co.

Trolley Supply Co.

TROLLEY WHEELS

Star Brass Works

TRUCKS, ELECTRIC CAR

Canadian Steel Foundries, Ltd.

TRUSSES, ROOF

Canadian Bridge Co.

Dominion Bridge Co.

TUBES, BOILER

F. H. Hopkins & Co.

TUBE CLEANERS

F. H. Hopkins & Co.

TURNBUCKLES

Canadian Steel Foundries, Ltd.

TURNABLES

Canadian Bridge Co.

Dominion Bridge Co.

UPHOLSTERY, CAR

Du Pont Fabrikoid Co.

VALVES

Canadian Detroit Lubricator Co.

R. D. Wood & Co.

VALVES, ANGLE AND GLOBE

Ohio Brass Co.

VALVES, BRASS GATE

Ohio Brass Co.

VALVES, LOCOMOTIVE POP

Taylor & Arnold

VARNISHES

Berry Bros.

VENTILATORS, CAR

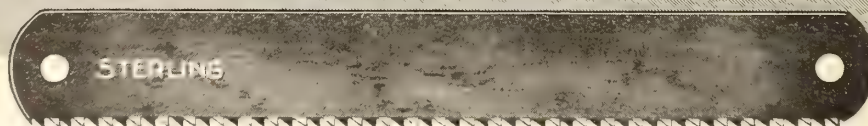
Automatic Ventilator Co.

VESSELS

Alphabetical List of Advertisers

A			L		
Algoma Steel Corporation.....	22		L'Air Liquide Society	71	
Allen General Supplies, Ltd.....	78		Lewis, Rice & Son.....	20	
Arnold Co.	79		Locomotive Superheater Co.....	22	
Association of Manufacturers of Chilled Car Wheels.....	—				
Automatic Ventilator Co.....	22		M		
B			Montreal Locomotive Works.....	15	
Babcock & Wilcox.....	19		Morrow, John Screw & Nut Co... 77		
Beatty, M. & Sons, Co.....	78		N		
Berry Bros.	13		National Steel Car Co.....	86	
Bertram, John & Sons, Co.....	1		Nicholson File Co.....	14	
Bradstreet Company	25		Norton, A. O., Inc.....	16	
Brown Hoisting Machinery Co...	73		Northern Electric Co.....	12	
Buffalo Brake Beam Co.	18		Nova Scotia Steel & Coal Co.... 6		
Burrows—Acton Burrows, Ltd...	24		O		
Butterfield & Co.	77		Ohio Brass Co.....	11	
C			Ottawa Car Manufacturing Co.... 78		
Canada Iron Foundries, Ltd.....	19		P		
Canada Machinery Corporation.. 3			Pedlar People, Ltd.....	16	
Canadian Brakeshoe Co.....	390		Piper, The Hiram L., Co.....	25	
Canadian Bridge Co.....	83		Polson Iron Works.....	74	
Canadian Bronze, Ltd.....	25		Positive Lock Washer Co.....	78	
Canadian Consolidated Rubber Co.	26		Pratt & Whitney Co. of Canada.. 23		
Canadian Detroit Lubricator Co.	80		Preston Car and Coach Co.....	82	
Canadian Fairbanks-Morse Co...	12		Pyke, J. W. & Co.....	23	
Canadian Government Railways.. 18			R		
Canadian Ingersoll-Rand Co.... 15			Rail Joint Co. of Canada.....	20	
Canadian Marconi Co.....	76		Roberts & Schaefer Co... 72 and 79		
Canadian National Carbon Co...	21		S		
Canadian Northern Railway.....	13		Shipman, Harold C., & Co.....	79	
Canadian Office & School Furni- ture Co.....	77		Sinclair, Angus.....	79	
Canadian Pacific Railway.....	79		Standard Coupler Co.....	82	
Canadian Ramapo Iron Works...	71		Standard Underground Cable Co. of Canada.....	25	
Canadian Steel Foundries, Ltd...	10		Star Brass Works.....	18	
Canadian Westinghouse Co.....	2		Steel Co. of Canada.....	58	
Canuck Supply Co.....	8		T		
Chicago Car Heating Co.....	82		Taylor & Arnold.....	76	
Coghlin, B. J., Co.....	19		Terry & Tench.....	79	
Consolidated Car Heating Co.... 80			Toch Bros.....	75	
D			Trolley Supply Co.....	23	
Date, John	77		W		
Dearborn Chemical Co. of Canada	14		Wood, R. D., & Co.....	24	
Dennison, H. J. S.....	79		*Advertisements marked with an asterisk appear in alternate issues.		
Diamond Saw & Stamping Works			84		
Dominion Brakeshoe Co.			75		
Dominion Bridge Co.			77		
Dominion Government Finance Department.			24		
Dominion Iron & Steel Co.			21		
Dominion Iron & Wrecking Co.			21		
Dominion Steel Foundry Co.			82		
Dominion Wire Rope Co.			9		
Drewry, E. L., Ltd.			77		
Duner Co.			82		
Du Pont Fabrikoid Co.			11		
E			Eastern Car Co.		
Electric Railway Improvement Co.			20		
F			Fairmont Gas Engine & Ry. Mo- tor Car Co.		
Flannery Bolt Co.			17		
Franklin Railway Supply Co.			17		
G			Galena-Signal Oil Co.		
Garlock Packing Co.			2		
Gartshore, J. J.			80		
General Ry. Signal Co. of Canada			4		
Goldschmidt Thermit Co.			74		
Grand Trunk Railway			10		
Griffin & Brinkerhoff			82		
H			Hart-Otis Car Co.		
Hopkins, F. H. & Co.			9		
Hunt, Robert W. & Co.			79		
Hunt-Spiller Mfg. Corporation...			78		
I			Imperial Bank of Canada		
*Imperial Guar. & Acc. Ins. Co.			—		
Imperial Oil Co.			25		
Independent Pneumatic Tool Co.			76		
International Correspond. Schools			75		
International Nickel Co.			82		
J			Joliette Steel Co.		
82					

HACK⁶⁶ STERLING⁹⁹ SAWS



Will prove an economical investment and should be used in every machine shop. Made in different gauges and pitches to suit all kinds of work. If you are not already a user of "Sterling" Blades—give them a trial.

Manufactured by

Diamond Saw & Stamping Works, Buffalo, N.Y., U.S.A.



Quality

Service

The Steel Company of Canada, Limited

PRODUCTS

"HAMILTON" PIG IRON
BASIC, MALLEABLE AND FOUNDRY

IRON AND STEEL
BLOOMS, BILLETS, BARS, WIRE RODS, ANGLES, CHANNELS,
PLOW BEAMS, ETC.

FORGINGS
Car Axles, Shape and Drop Forgings, Horse Shoes, Carriage and Automobile Hardware, Top Goods Etc.

WIRE, ETC.
Steel, Brass, Copper and Bronze, Heavy and Fine, Bright Annealed, Coppered, Liquor Bright
Galvanized and Tinned. Stranded, Steel and Copper Cable, Clothes Line, Wire Nails,
Staples, Barb Wire, Woven Wire Fencing, Fence Gates

RAILWAY FASTENINGS
Angle Bars, Track Bolts, Tie Plates, Spikes, Tie Rods, Etc.

NAILS, SPIKES, RIVETS, ETC.
Wire, Cut, Boat and Horse Shoe Nails, Railway, Pressed and Drift Spikes
Tack and Shoe Nails, Steel and Copper Rivets and Burrs, Iron, Brass and Copper

POLE LINE HARDWARE
Pole Steps, Cross Arm Braces, Guy Clamps and Guy Rods, Etc., Black and Galvanized

BOLTS, NUTS AND WASHERS
Machine, Carriage, Elevator, Stove, Tire and Sleigh Shoe Bolts, Blank, Tapped Nuts and Washers

WROUGHT PIPE
Black and Galvanized Nipples and Couplings

SCREWS
Wood and Machine Steel, Brass and Bronze

LEAD PRODUCTS
Lead Pipe, White Lead, Shot and Putty

The Steel Company of Canada, Limited

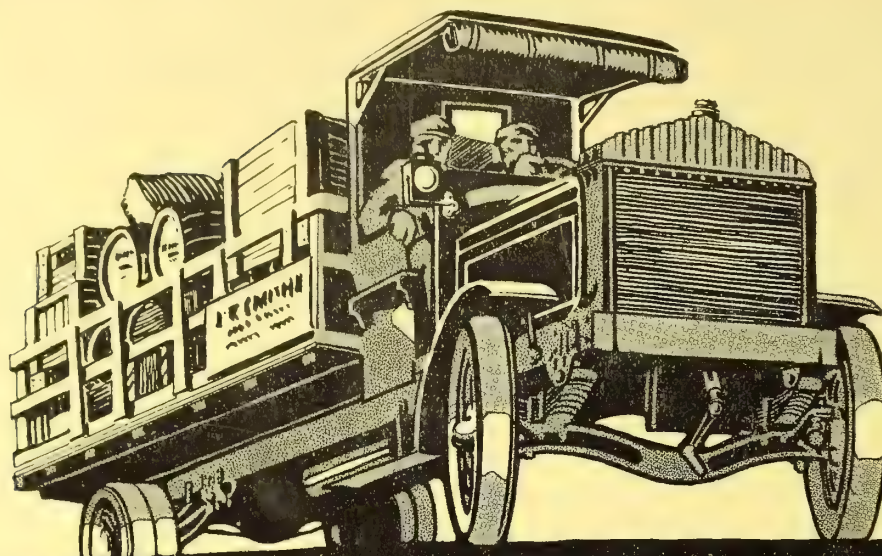
HAMILTON

TORONTO

MONTREAL

WINNIPEG





There's Power & Capacity in NATIONAL TRUCKS

Railroad and Express Companies

Motor Trucks that will stand up day after day under the service demanded by Freight and Express delivery and give this continuous service with the greatest economy and mileage are worth investigating.

National Motor Trucks are Sturdy, Dependable and Economical. Every National is on the road every day. Stop the first one you see and ask the driver. He will tell you of National POWER, STRENGTH and MILEAGE—and of the unique National Service Plan.

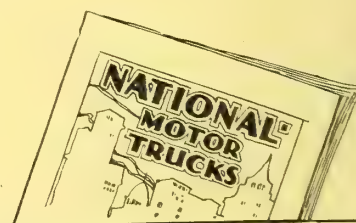
National Trucks will be exhibited at the Canadian National Exhibition. See the 3½ ton Truck built for Gunns Limited.

First Send for the Catalogue.

National Steel Car Company, Limited

Montreal Office :
SHAUGHNESSY BLDG.

Works and Operating Offices:
HAMILTON, CANADA



SEND THIS CATALOGUE ::

To _____

Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 224

TORONTO, CANADA, OCTOBER, 1916

Subscription Rates, Page 113

BERTRAM MACHINE TOOLS

THE care taken to guard
every possible point of
danger on the

24 in. Crank Slotter

illustrated on this page is
only one instance of the
careful attention to detail
in the design and con-
struction of our product to
maintain

SAFETY
IMPLICITY
ERVICE



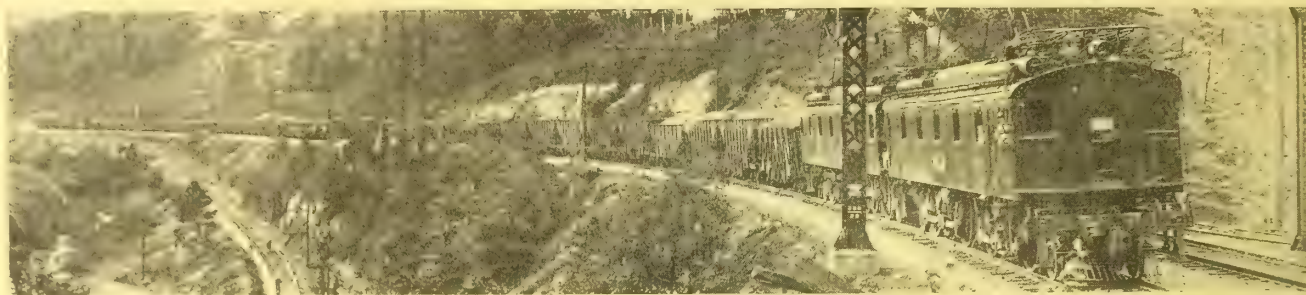
The John Bertram & Sons Co., Limited

Dundas, Ontario, Canada

MONTREAL
723 Drummond Bldg.

VANCOUVER
609 Bank of Ottawa Bldg.

WINNIPEG
1205 McArthur Bldg.



Train Control By Regeneration of Power On Down Grades

Advantages:

1. **Security in Operation**, due to the fixed speed of train, and the full capacity of air in the brake system in reserve.
2. **Saving in Equipment Maintenance**, due to decreased wear on wheels and brake shoes, as well as reduced shock to draft rigging, cars and lading, secured by uniform-speed operation.
3. **Saving in Power** due to the energy of the train, represented by the difference in elevation, being absorbed by the motors on the locomotive, and there converted to power available for use by other trains.

The Baldwin - Westinghouse Electric Locomotives on the Elkhorn Grade Electrification of the Norfolk & Western Ry. secure these features without additional apparatus, complication or manipulation.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

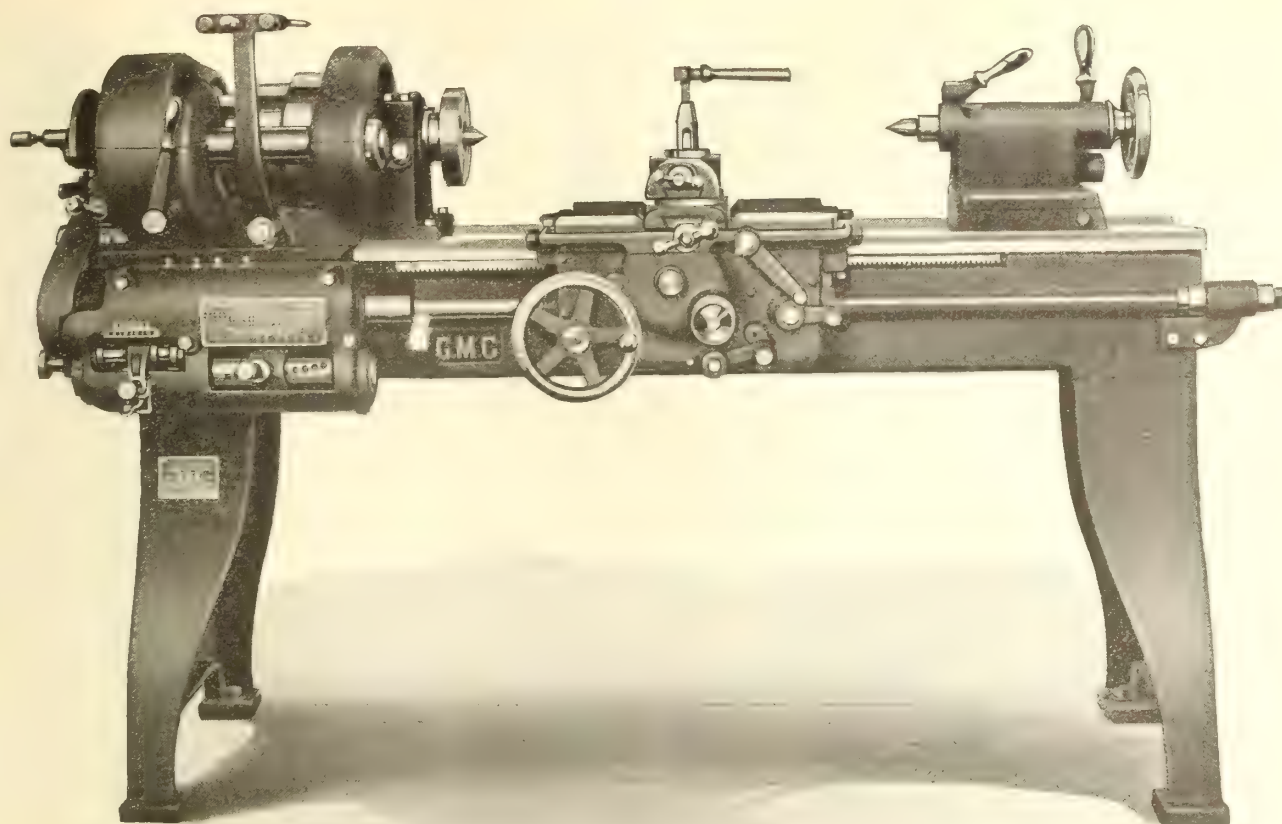
TORONTO, Traders Bank Bldg. MONTREAL, 52 Victoria Sq. OTTAWA, Ahearn & Soper, Ltd. HALIFAX, 105 Hollis St. FT. WILLIAM, Telfer Bldg.
EDMONTON, 211 McLeod Bldg. WINNIPEG, 158 Portage Ave. E. CALGARY, Grain Exchange Bldg. VANCOUVER, Bank of Ottawa Bldg.

CANADIAN STEEL FOUNDRIES LIMITED

STEEL CASTINGS - MANGANESE STEEL CASTINGS
GRAY IRON AND SEMI STEEL CASTINGS - BAR STEEL
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK

GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
LONDON (ENG) OFFICE —
— TRAFALGAR HOUSE, WATERLOO PLACE.

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL



ANNOUNCING a new addition to the C.M.C. Line of High-Grade Machine Tools

THIS 14-inch quick-change Engine Lathe has recently been designed to meet the demand for a Quick-Change Engine Lathe with all modern improvements of practical value, and at the same time provide a lathe that will be well adapted for use in small shops, owing to its great range of usefulness.

Advantage has been taken of many years' experience in using, building and designing engine lathes, and at the same time some of the best of recent ideas of proved worth found in American and British Engine Lathes have been incorporated in this design.

This lathe marks an advance on the engine lathe sold to-day in its **UNIQUE COMBINATION OF HANDINESS, CONVENIENCE AND ADAPTABILITY.**

FOR instance, the thread-cutting range on this lathe is, without changing a single gear, from 32 threads per inch to 5" lead, or by changing two gears on plate, from 64 threads per in. to 5" lead, or one thread in 5". By making extra change gears for the quadrant plate, practically any thread can be cut between the limits of 100 threads per in. and 5" lead. The relieving attachment supplied with this lathe, when equipped for the tool room, is universal, being applicable to external, parallel, taper, angular or spiral reliefs, or to internal reliefs or end reliefs.



CANADA MACHINERY CORPORATION

LIMITED

GALT, ONTARIO

Builders of Machine Tools and Woodworking Machinery.

GALENA OILS

HAVE NO EQUAL IN
QUALITY, EFFICIENCY and ECONOMY

SOLE MANUFACTURERS OF
Celebrated Galena Coach, Engine and Car Oils
LUBRICATION ON A GUARANTEED BASIS

ELECTRIC RAILWAY LUBRICATION
A SPECIALTY

Perfection Valve and Signal Oils

Galena Railway Safety Oil—Made especially for use in
headlights, marker and classification lamps.

Galena Long Time Burner Oil—For use in switch and
semaphore lamps, and all lamps for long time burning,
avoiding smoked and cracked chimneys and crusted
wicks.

TESTS AND CORRESPONDENCE SOLICITED

Galena Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.

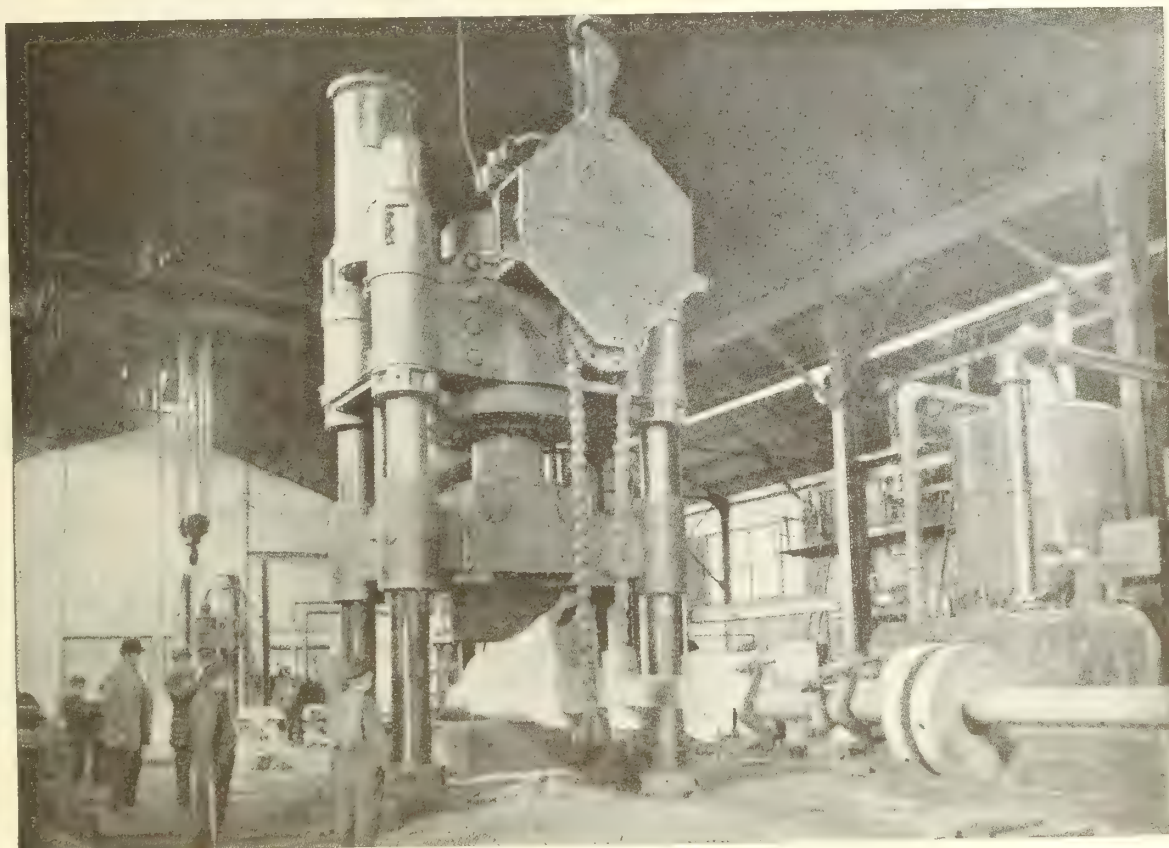
Nova Scotia Steel & Coal Company

LIMITED

Manufacturers of Steel for Shrapnel Shells and Admiralty Forgings

Only Company in Canada producing Steel Ingots by the "Harmet" liquid process

Can supply Forgings up to 40 Tons in weight to all Admiralty and Lloyd's Tests and Specifications



FORGING A RUDDER FRAME

Why "Harmet" Liquid Process Steel Ingots are Superior to Ordinary Steel Ingots:—

1. Prevention of cracks due to shrinkage; of internal stresses and resulting cracks and fissures.
2. Early cessation in the crystallization of the metal, and the production of fine crystallization without cleavage planes.
3. Lessening of segregation, i.e., reduction of tendency of carbon and other impurities to concentrate in the central and upper parts of the ingot.
4. Prevention of "pipes" or interior cavities, and thus preservation of absolute solidity in the ingot.
5. Improvement in physical properties.
6. Reduction in waste of ingot.

OUR modern Steam Hydraulic Forge Shop at New Glasgow, N.S., part of which is shown above, and our large Steel Plant at Sydney Mines, N.S., equal the very best in America.

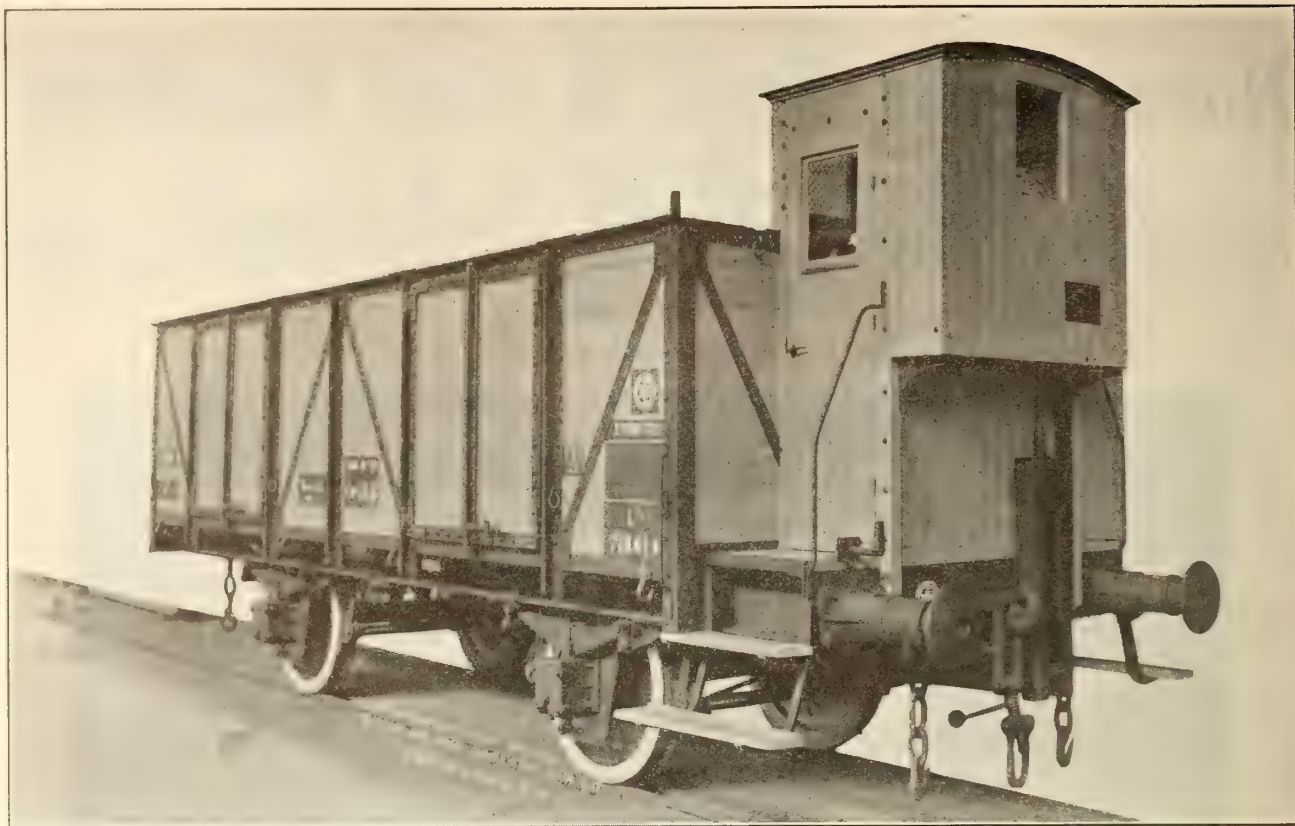
On the shortest notice, we can supply forgings of all shapes and sizes, made of ordinary or "Harmet" fluid compressed open-hearth steel, and satisfying the most severe specifications.

Our forges are modern in every respect—designed and installed after close study of the latest developments in all countries. Moreover, we produce the highest grades of steel by the most approved methods. It has always been the policy of "Scotia" to hold a position in the front rank of trade, and by the recent additions to plant, this policy has been maintained in a practical manner, bringing "Scotia's" equipment abreast of the best foreign forges.

For prices and full particulars, write to

Head Office, NEW GLASGOW, N.S.

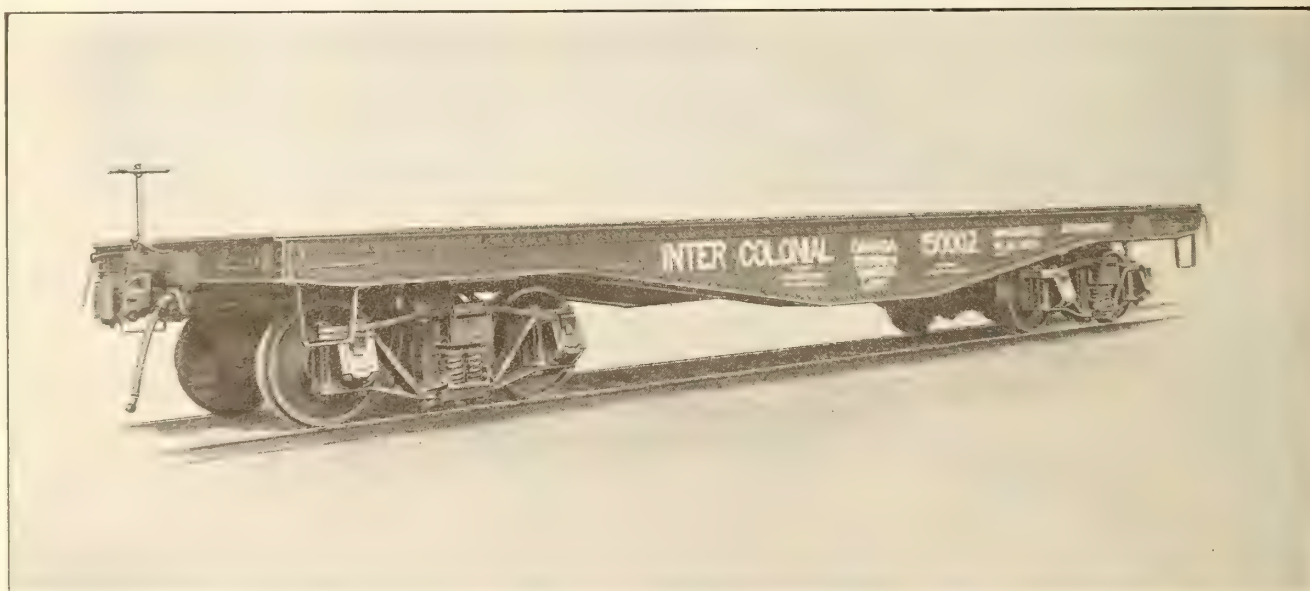
Western Sales Office, Room 14, Windsor Hotel, Montreal



ONE OF 2,000 GONDOLA CARS NOW UNDER CONSTRUCTION FOR THE FRENCH GOVERNMENT.

FREIGHT CARS TO FOREIGN ORDER

We have unexcelled water and rail shipping facilities for the export of freight cars of all types abroad or to United States markets. Our manufacturing capacity reaches to 40 cars per day. Although fully employed in filling and conducting negotiations for further foreign orders, our exceptional output facilities enable us both to take care of these and others in the order in which they are received.



75 TON SPECIAL PIT CAR FOR CANADIAN GOVERNMENT RAILWAYS.

FLAT CARS, CABOOSES, AND MINE CARS

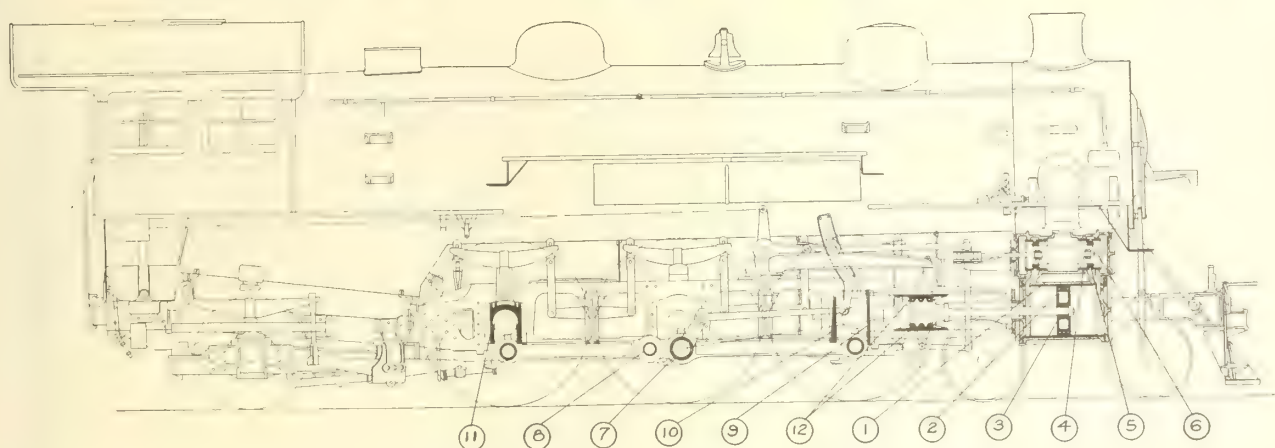
We make a specialty of Flat Cars, Caboose and Mine Cars for both Home and Foreign Markets in Wood, Steel Frame or "All-Steel" and shall be pleased to quote against all capacity requirements and quantities.

Eastern Car Company, Limited

General Offices and Works, New Glasgow, N.S.

Montreal Office, Room 14 Windsor Hotel

Hunt-Spiller Gun Iron



In the Following Locomotive Castings

- | | |
|----------------------|-------------------------|
| 1. Cylinder Bushings | 7. Side Rod Bushings |
| 2. Cylinder Packing | 8. Knuckle Pin Bushings |
| 3. Pistons | 9. Pedestal Shoes |
| 4. Valve Bushings | 10. Pedestal Wedges |
| 5. Valve Packing | 11. Driving Boxes |
| 6. Valve Bull Rings | 12. Crosshead Shoes |

Increases

Engine Efficiency
Engine Mileage

Decreases

Engine Failures
Engine Repairs

— RESULTS —

EFFICIENT SERVICE — MONEY SAVED

GIVE US A TRIAL

CANUCK SUPPLY CO.

LIMITED

Montreal
Que.

Toronto
Ont.

Winnipeg
Man.

Vancouver
B.C.

It Actually Earns \$161.00 A Day For This Railroad

THIS is not an absurdity, but a fact; and here is how.

In breaking scrap in the yards of a well managed eastern railroad, a Brownhoist equipped with a magnet is used, dropping an 8,000 lb. weight on the castings.

Previous to installing the Brownhoist large castings were not broken, as there was no economical way of doing it. Consequently large scrap castings were worth only \$7.50 per ton.

By the aid of a Brownhoist, equipped as above described, all large scrap castings are broken, thereby having a value of \$14.00 per ton in their broken state.

On this work, 26 tons of castings are broken in a ten hour day, at a cost as follows:

Engineer, 10 hrs. @ 34c per hr.....	\$ 3.40
Coal, ½-ton @ \$1.25.....	.63
Valve Oil, 1 pt. @ \$.477 per gal .....	.63
Engine Oil, 1 qt. @ \$.277 per gal .....	.07
Miscellaneous Supplies .....	.10
Repairs, including general repairs.....	.91
Total for Hoist.....	\$ 5.17
One Helper @ 20c per hr.....	2.00
Total Cost for Brownhoist per 10 hr.	\$ 7.17
Value of 26 tons broken castings @ \$14	
per ton	\$364.00
Value of 26 tons unbroken castings @ \$7.50	
per ton	195.00
Gross profit by use of Brownhoist.....	\$169.00
Less Cost of Breaking.....	7.17
Net profit gained by use of Brownhoist.....	\$161.83

In the face of this graphic instance of the dividend paying possibilities of the Brownhoist—can you afford not to investigate the possibilities of a Brownhoist on your road?

These actual time and money saving railway jobs, shown on this page every month, are made possible by the three cardinal features of the Brownhoist—namely—Speed, Durability and Safety.

Our new Catalog I on "Locomotive Cranes" illustrates many time and labor saving jobs on railway work. Have you a copy? Write.

BROWNHOIST

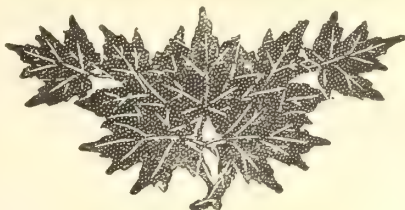
The Brown Hoisting Machinery Co.

Cleveland, Ohio, U. S. A.

Montreal Office: 145 St. James St.

Engineers and Manufacturers of Cranes and Hoists



**Quality****Service**

Courtesy in Business



Fittingly framed and hanging in the Offices of one of the most important Public Service Corporations on this North American Continent is the following

'Did you say Please and Thank you?'

Broad minded men direct the destiny of that Corporation, men who know that public or private enterprises to be lastingly successful must operate for the public good.

Quality and Service are the two important factors in our business life today, but Courtesy is the door through which they must enter.

We are large producers of Hamilton Pig Iron and our output of Open Hearth Steel Blooms and Billets, Iron and Steel Bars of all shapes and size runs into enormous tonnage.

The products of our mills include practically everything that can be manufactured from Iron and Steel and these we distribute to thousands of satisfied customers.

Our business is an extensive one and a successful one. The World is our market: but our prosperity and success in the future, as in the past, depend upon the continued confidence, co-operation and good-will of the people we serve.

The Steel Company of Canada, Limited

HAMILTON TORONTO

MONTREAL WINNIPEG





"DURABLE" Wire Rope

MADE IN CANADA

Replaces Manilla for Stevedoring
and other hoisting.

The Dominion Wire Rope Company, Limited

Montreal and St. Catharines

General Service Cars

Otis Dump Cars

— PATENTED —

Built in Any Size
or Capacity

=====
All Steel, Wood or
Composite



For Standard or
Special Service

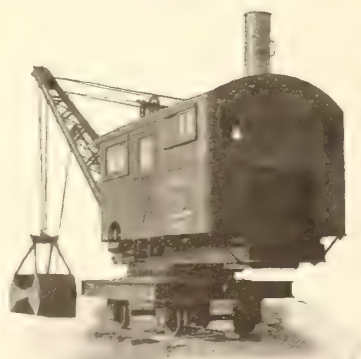
=====
Thousands in Use

The Standard Coal Car on Canada's Leading Railroads.

Designed and Built by

The HART-OTIS CAR CO., Limited, MONTREAL

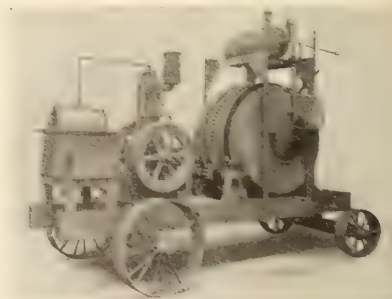
—Sole Patentees for General Service Cars for Canada—



"Industrial Works" Cranes

Increase Profits by Reducing Handling Costs

"Ransome" Mixers



Concrete Carts, Buckets, Wheelbarrows

Branch:
St. Catharines, Ont.

F. H. Hopkins & Co

Head Office:
MONTREAL



This Crossing Is Protected

National Trolley Guard has been installed.

If the trolley wheel leaves the wire it is caught by the guard from which it receives current until the car is beyond the danger-zone.

The maintenance of National Trolley Guard is negligible—the protection it affords is invaluable.

Full information on request.

The Ohio Brass Company
MANSFIELD, OHIO

**You Men
Who Buy Equipment
Ought to Try**



REG. U. S. PAT. OFF.

The UPHOLSTERING and VESTIBULE CURTAIN material that "MAKES GOOD" with the user.

Place a Trial Order
Thereby doing your road a service.

Du Pont Fabrikoid Company

Canadian Factory, Toronto, Canada

Du Pont Building, Wilmington, Del.

Wendell & MacDuffie Co., Railroad Department Representatives, 61 Broadway, New York



Canadian Northern All the Way

From the Laurentians to the Rockies

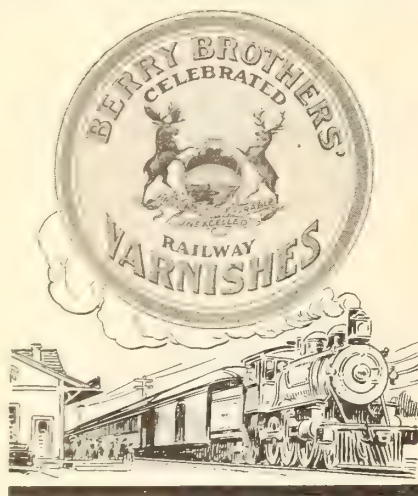
Serving Canada's National Playgrounds, including

Grand Discharge of the Saguenay: Laurentide National Park: Algonquin National Park: Muskoka Lakes: Georgian Bay Hinterland: Nipigon Forest Reserve: Quetico National Park: Vermillion Lakes: Jasper National Park: and Mount Robson National Park.

All Modern Equipment

Summer Tourist Fares

For Literature and information apply to General Passenger Dept., 68 King St. E., Toronto, Ont., 226 St. James St., Montreal, Que., or Union Station, Winnipeg, Man.



Berry Brothers' Railway Varnishes

Need no introduction to experienced railway men. For nearly 60 years they have been the standard of railway varnish quality and their constantly increasing sale is undisputable testimony of their great efficiency.

Here are a few valuable finishes for railway use.

Inside Coach Finishing

A high grade varnish, very pale, heavy bodied and well matured. It is an easy working, free flowing varnish and dries quickly and hard with an attractive lustre.

Outside Coach Rubbing

A very pale, easy working varnish, dries quickly and can be rubbed in two days.

Inside Coach Rubbing

A superior rubbing varnish, is light in color, dries and hardens quickly, rubs easily and makes an ideal surface for the finishing coats.

Luxeberry Wood Finish

A high grade interior varnish for Stations, etc. Can be rubbed and polished if desired.

Outside Coach Finishing

A pale full-bodied varnish that dries dust free quickly. It is very durable, resisting wear and tear and dries with an attractive lustre.

If you have not already received a copy of our new catalog of Railway Varnishes, write us today, for the best catalog of its kind ever published.

BERRY BROTHERS
(INCORPORATED)
World's Largest Varnish Makers

WALKERVILLE

ONTARIO

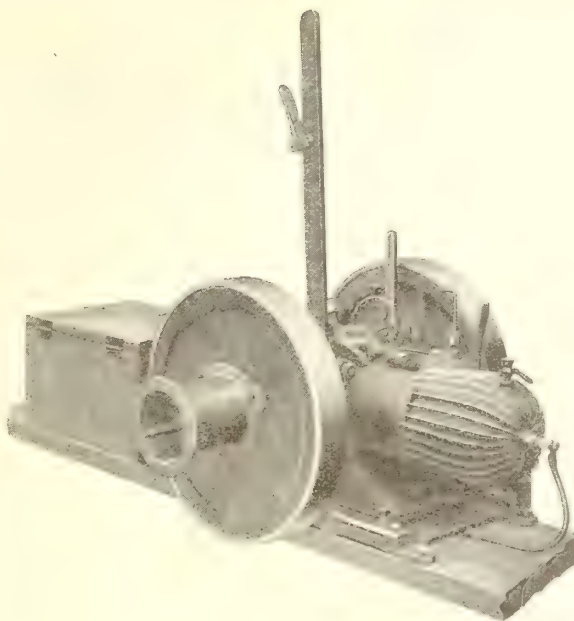
The Air Cooled Jack Canuck Section Man's Engine

Fitted with Air Cooled Cylinder which materially reduces the weight and makes it absolutely reliable under all conditions of weather.

The Air Cooled Jack Canuck is a kerosene engine—a vital consideration with gasoline at the present high prices.

Terms liberal—\$10.00 with the order.
\$10.00 per month until paid for.

Write now for particulars.



The Canadian Fairbanks-Morse Co., Limited

MONTREAL, QUEBEC, ST. JOHN, OTTAWA, TORONTO, HAMILTON, WINNIPEG,
SASKATOON, CALGARY, EDMONTON, VANCOUVER, VICTORIA.



Superintendents of Motive Power, Fuel Agents, Officials in Charge of Operation

Should investigate the merits of the Dearborn Method of Water Treatment.

It is inexpensive—costs less than any other method.

It is effective—the waters requiring treatment are analyzed, and the treatment made to meet the actual requirements.

It accomplishes—the removal and prevention of scale—stops leaks—prevents corrosion—overcomes all foaming trouble.

The benefits—life of boiler tubes greatly lengthened—expense for boiler work reduced to minimum—mileage between boiler washings increased—large saving in fuel effected by having boilers free from scale. All the troubles due to bad water overcome and service generally improved.

Experts furnished to instruct in application of treatment.

Now used on more than 100 American railways.

Dearborn Chemical Company of Canada, Limited

Office and Works : 1220-1230 Dundas Street, Toronto, Canada

On Active Service

—One or other of the "Famous Five" Files will be found on the benches in nearly every workshop in Canada.

The machine shop man likes them for their balance and cutting qualities.

The carpenter chooses them for the same reasons.

The blacksmith prefers them for their rugged strength.

Sixty millions of them are made and used every year.

And they always give satisfaction.

Specify them when ordering.

The "Famous Five" are:

**Kearney & Foot—Great Western
American—Arcade—Globe**

(Made in Canada)

The Nicholson File Company

PORT HOPE *(Dealers Everywhere)* ONTARIO

**50
YEARS
IN THE
BUSINESS**

**OVER
60,000,000
FILES
A YEAR**

Ingersoll-Rand Straight Lift Air Hoist

will save time and money in the short heavy lifts around the shop.

They are designed for accurate and easy adjustment of material in foundry, machine shop, warehouse or any other department of the plant where lifting is necessary.

Canadian Ingersoll-Rand Co., Limited

Commercial Union Bldg., MONTREAL, CANADA

Works: SHERBROOKE, QUE.

SYDNEY TORONTO COBALT TIMMINS WINNIPEG NELSON VANCOUVER

Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE—INTERCOLONIAL RAILWAY

Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 28½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

Montreal Locomotive Works, Limited

DOMINION EXPRESS BUILDING, MONTREAL, CANADA


Good for Several Decades

With labor scarcity and labor costs continually increasing, why not cut them out of your figuring altogether as far as culvert maintenance is concerned, by the use of Culverts that prove repairs are unnecessary and maintenance expense is only for those who will not heed the logic of foresight.

Pedlar's "Perfect" Culverts

not only cost less to handle and instal, but are good for several decades without repair expense. Can be used for any style of construction suited to your particular needs.



Made of heavy gauge, deeply corrugated and galvanized anti-corrosive  Cannot rust, rot, pit or corrode, and are unaffected by frost or climatic conditions. Shipped in sizes from 8 to 84 in. in diameter and in lengths up to 40 feet. Larger sizes and lengths to order.

The Culvert Reference Book No. 4 R. M. is full of valuable information and drainage tables. Free on request. Write!

THE PEDLAR PEOPLE, Limited

(ESTABLISHED 1861)

Executive Office and Factories, OSHAWA, ONT.

Branches :

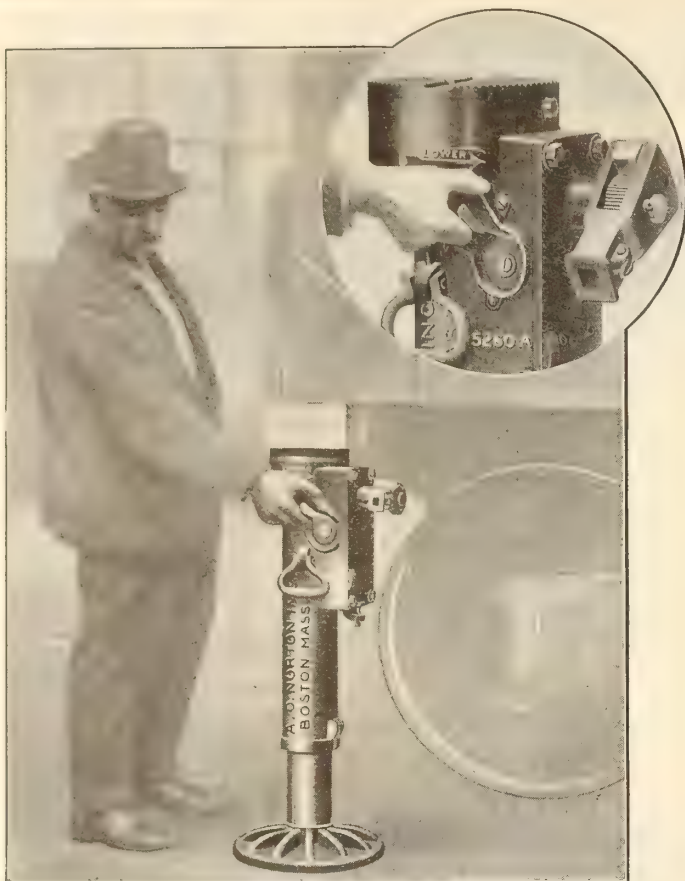
MONTREAL

OTTAWA

TORONTO

LONDON

WINNIPEG



Don't Pump Your Jack Down

Lower the Load by "Pressing the Button"

The Norton Self Lowering Jack

is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

Send for Illustrated Catalogue No. 28.

A. O. Norton, Limited
Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents :
MUSSENS LIMITED

Montreal Toronto Winnipeg Cobalt Calgary
Vancouver



PREPAREDNESS—Many of our customers have been applying large numbers, and in some cases complete installations, of Tate Flexible Staybolts to their locomotive fireboxes, and thus are prepared to handle the heavy business during the present season.

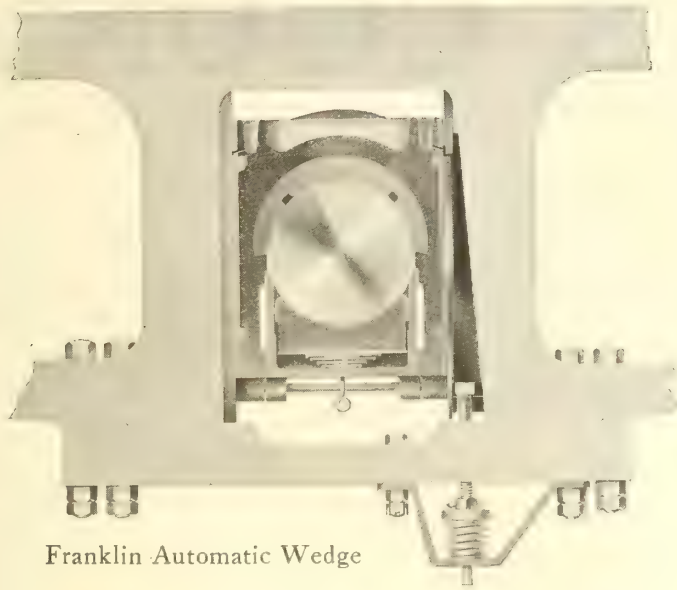
THE TATE FLEXIBLE STAYBOLT has been used quite extensively since 1904 in the locomotive fire boxes, and its service records all go to prove that it has done more to improve conditions of staying and preserve the life of the firebox than any staybolt so far used.

WE RECOMMEND THIS BOLT to the railroads of Canada and to all users of the fire-box type of boiler where staybolts are necessary, with the assurance that it will be found strong, serviceable, economic and most effective in reducing staybolt breakage and firebox repairs.

OVER 16,000,000 BOLTS IN SERVICE.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.



Franklin Automatic Wedge

Driving Box Wedges in a New Light

It's new for driving box wedges to keep engines out of the shop four additional months.

Usually they are to blame for premature shoppings. This wedge has a record of adding 13,500 additional miles between shoppings.

Franklin Railway Supply Company

30 CHURCH STREET, NEW YORK

332 So. Michigan Ave.
CHICAGO

625 Transportation Bldg.
MONTREAL

STEEL SHIPBUILDERS

Engineers and Boilermakers



24-inch Suction Dredge built for Canadian Government Harbor Service on Hudson Bay.
This is the second largest dredge built in Canada.

Marine Engines and Boilers, All Sizes

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto

RESULTS COUNT

That's Why 480 Railroad Shops Are Using Thermit

Thermit offers the only sure and reliable repair for locomotive frames and other heavy sections.

The superheated liquid Thermit steel is produced in bulk and poured all at once into a mold surrounding a broken section, resulting in the perfect amalgamation of the Thermit steel with the parts with which it comes in contact. The fact that those parts are first preheated, makes the weld doubly sure.

The operation of welding locomotive frames is easily accomplished, without removing the frame from position, and with very little dismantling, no matter if the frame be broken in the splice, jaw, next to the cylinder saddle, or at any other point. The engine is returned to service in from ten to twelve hours.

Hundreds of thousands of pounds of Thermit are being used annually by railroad companies in the United States and Canada.

There is only one reason for this, and that is that Thermit produces results and we all know that "results count."

Our pamphlet No. 2144 will be of interest.

All Thermit and Thermit appliances are made in our Canadian shops.

GOLDSCHMIDT THERMIT COMPANY

103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco. Equitable Bldg., 120 Broadway, New York

7300 So. Chicago Ave., Chicago



Highlands of Ontario, Canada

The Home of the Red Deer and the Moose

OPEN SEASONS

DEER—November 1st to November 15th inclusive.

MOOSE—November 1st to November 15th inclusive. In some of the Northern Districts of Ontario, including Timagami, the open season is from November 1st to November 30th inclusive.

Write for copy of "Playgrounds The Haunts of Fish and Game" giving Game Laws, Hunting Regulations, etc., to

J. QUINLAN,
Bonaventure Station,
MONTREAL, QUE.

C. E. HORNING
Union Station,
TORONTO, ONT.

Buffalo Brake Beam Company

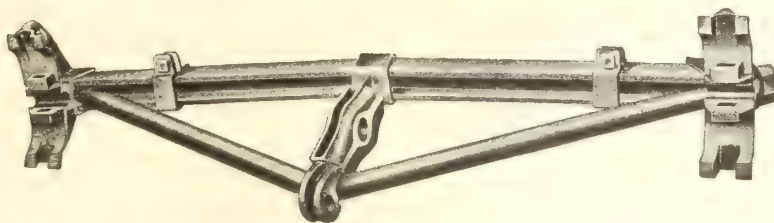
BUFFALO BEAMS ARE BEST BEAMS

Offices:

NEW YORK
30 Pine Street

ST. LOUIS
Syndicate Trust Bldg.

MONTREAL
195 Commissioner St.



Works:

BUFFALO,
N.Y.

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment



THE STAR BRASS WORKS
KALAMAZOO, MICH.



The Star Brass Works

Largest Exclusive Trolley Wheel Makers in the World.

Kalamazoo

Michigan



Canada Iron Foundries, Limited

Chilled Tread Cast Iron Car Wheels for All Services
Cast Iron Water, Gas and Culvert Pipe,
Flanged Pipe and Specials
Railway Castings

HEAD OFFICE:

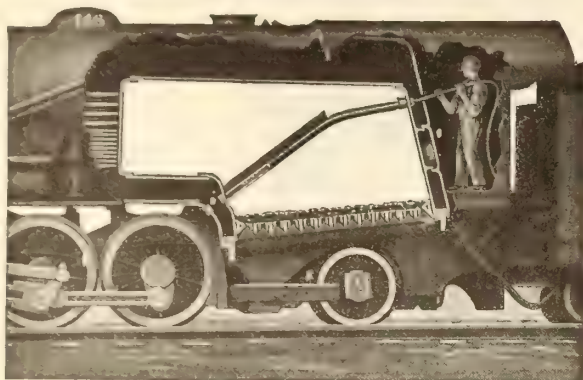
Mark Fisher Building

- - -

Montreal



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes.

Lagonda Arch Tube Cleaners

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

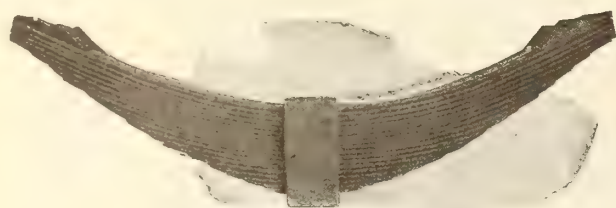
The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

Other Lagonda Boiler Room Specialties are described in our General Catalogue L. Send for Copy.

Babcock and Wilcox, Limited

Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Buildin



Driving Spring, Loose Ends and Slots.

Railway Springs

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.
EQUALIZING, DRAWBAR, BUFFER AND SPIRAL SPRINGS of all kinds.

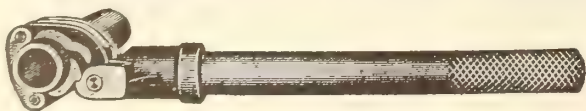
STREET RAILWAY SPRINGS, from the largest to the smallest.

TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE SANDERS, CHAIN, Etc.

Manufactured by

B. J. Coghlin Company, Limited
Montreal, Canada

The Parmelee Pipe Wrench



Price List C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	3/8, 1/2, 3/4, 1 in.	\$5.00	\$2.25	3/8, 1/2, 3/4, 1 in. \$.75
20 in.	2 1/2	3/4, 1, 1 1/4, 1 1/2, 2 in.	7.50	2.50	3/4, 1, 1 1/4 in. 1.00 1 1/2, 2 in. 1.25
25 in.	3 1/2	1 1/2, 2, 2 1/2, 3 in.	7.50	3.00	1 1/2, 2, 2 1/2, 3 in. 1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Limited
Toronto, Canada

"The Toothless Wonder"

Designed Especially to handle pipes spaced closely as in coil work. No. 2 1/2 wrench illustrated requires but three-quarter inch space between pipes.

Positive Grip instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

Ratchet-like Action. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

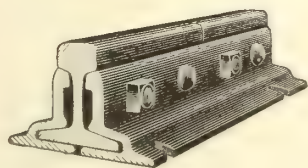
Can't Chew. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

Can't Crush. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.

The Rail Joint Company of Canada, Limited

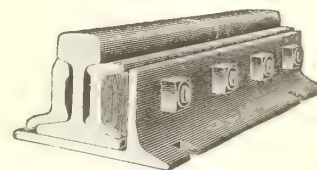
McGill Bldg., MONTREAL

36 Broad Street, London, E.C.

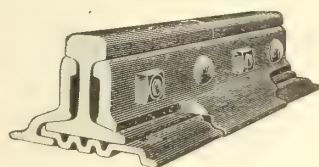


CONTINUOUS

Continuous,
Weber, Wolhaupter and
100 p.c. Rail Joints.



WEBER



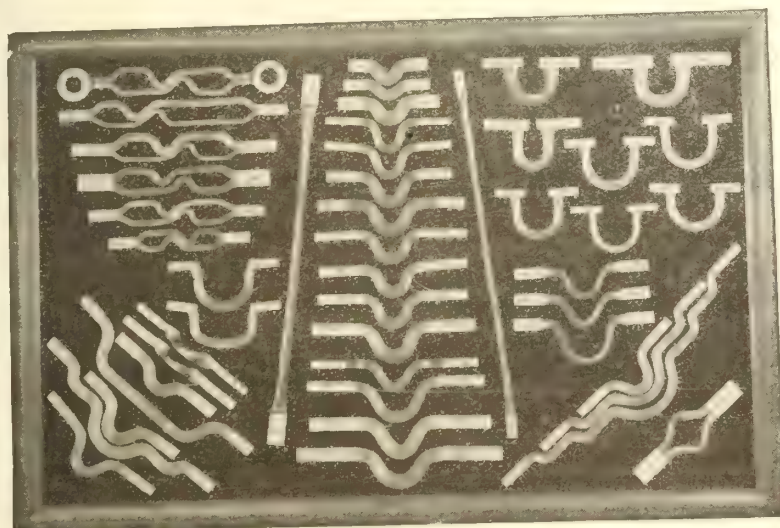
WOLHAUPTER

Standard—Insulated
Sep—Frog and Switch
Protected by Patents.

Grand Prize, San Francisco, 1915.



100 p.c.



Electric Weld Rail Bonds

meet every condition.

Neither do they corrode
at the terminals.

The Electric Railway
Improvement Co.

Cleveland, Ohio

Dominion Iron & Steel Co., Limited

Manufacturers of

Basic Open Hearth Steel Rails

We will be pleased to have your enquiries for 1916 shipments

Head Offices
and Works

Sydney, Cape Breton, Canada

CARBON PRODUCTS

What are your carbon needs? No matter what class of carbon products you require we can serve you satisfactorily.

LIGHTING CARBONS—Head-light carbons in all sizes and shapes for all classes of headlight service.

Carbons for all styles of open, enclosed and flaming arc lamps.

Searchlight carbons in all sizes for any class of searchlight service.

WELDING CARBONS—A complete line of carbon points for welding, repairing and cutting metals by the electric arc process. Also carbon plates, carbon blocks and carbon paste for backing up welding processes.

CARBON BRUSHES—A complete line of carbon, graphite and metal composition brushes to meet every motor and generator operating condition. We not only make carbon brushes, but we "prescribe" them—the right grade for your machine.

CARBON ELECTRODES—All sizes and shapes for electric furnaces. We make electrodes from a fraction of an inch to two feet in diameter.

CARBON SPECIALTIES—Anything in manufactured carbon. In short, "If it's carbon—we make it."

Write and Tell Us Your Requirements.

Canadian National Carbon Company, Limited

265 Adelaide Street West, Toronto, Ontario

Dominion Iron & Wrecking Company

LIMITED

Railway Equipment, Rails and Machinery

Dismantlers of BRIDGES, PLANTS, STEAMERS, MILLS

Dealers in IRON, STEEL, SCRAP METALS

General Offices: Transportation Building

MONTREAL, QUE.

QUEBEC

Car Ventilation

Expert Advice is as needful in this as in other matters of Car Construction. Is not the experience of twelve years, devoted exclusively to this field, worth anything to you? We have it, and it is yours for the asking.

CAR VENTILATORS of all types at prices from \$1.50 up.

For information address

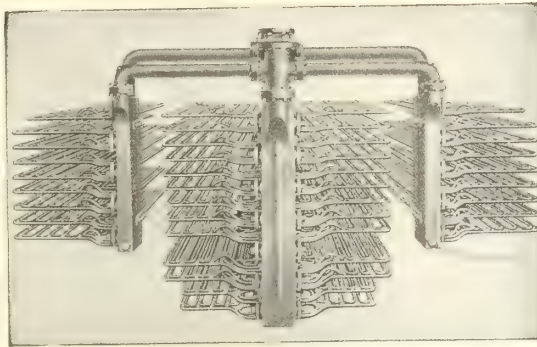
Automatic Ventilator Company

No. 2 Rector Street

New York, N.Y.

Fire Tube Marine Superheater -- Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler h.p. from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, New York, N.Y.

Peoples Gas Bldg., Chicago, Ill.

ALGOMA STEEL CORPORATION LIMITED

STEEL RAILS
PLICE BARS
STEEL TIE PLATES

PIG IRON
BASIC & BESSEMER



STRUCTURAL SHAPES
STANDARD MERCHANT
BARS

BLOOMS BILLETS
& SLABS

SAULT STE. MARIE, ONT. CANADA.

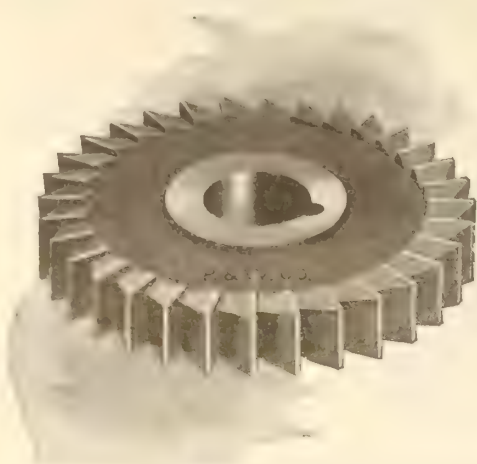
Are You in the Market for Trolley Catchers, Retrievers, Bases or Head Lights

We manufacture Knutson No. 5 Trolley Retriever, Knutson No. 2 Trolley Retriever, The Ideal Trolley Catcher, The Simplex Trolley Base, The Peerless No. 10 Roller-bearing Trolley Base, The Peerless Check Valve, The Peerless Junior Head Light, The Perfect Head Light, The Hollis Safety Fender, No. 3 Detachable Fender.

Write our Canadian Representatives Allen General Supplies, Limited they will be pleased to give you complete information as to any of the above as well as our other lines.

Trolley Supply Company, Canton, Ohio

Address all correspondence to Allen General Supplies, Limited, 205 Yonge St., Toronto



Milling Cutters

TAPS—DIES—REAMERS—DRILLS

MADE
IN —BUT—
CANADA
SOLD
ON
MERIT

Pratt & Whitney Co. of Canada, Ltd.

DUNDAS, ONTARIO

Montreal

Vancouver

Winnipeg

Jas. W. Pyke & Company, Limited

Iron, Steel and Metal Merchants

Locomotive, Driving, Engine and Tender Truck Axles, Passenger, Freight, and Electric Tram Car Axles—To Standard or Railway's own Specification.

Staybolt and Engine Bolt Iron—Quality and Service Unexcelled.

Steel Plates—Firebox, Flange and Tank Qualities.

Structural Shapes—Beams, Channels, Angles, Tees, Zees, etc.

Steel Billets and Forgings—of all descriptions.

Locomotive Boiler and Superheater Tubes—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
232 St. James Street,

Montreal

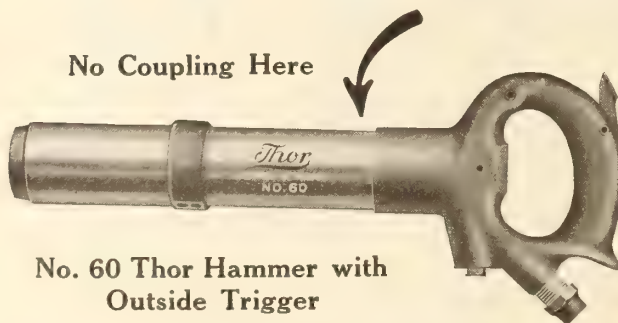
Thor

Most powerful,
durable and eco-
nomical hammer
on the market.
Shipped on trial
—free

One Piece Long Stroke Riveter

THE HAMMER THAT CAN'T COME LOOSE

No Coupling Here



No. 60 Thor Hammer with
Outside Trigger

Successfully used by
shipyards and marine
shops for driving $\frac{7}{8}$ "
flush rivets on the
engine room bulk-
head.

Independent Pneumatic Tool Company

334 St. James St., Montreal, Que.



Copyrighted by International News Service.

Why?

A defective signal wire might easily cause just such an awful wreck as this.

Why take the chance?

To safeguard your road against such catastrophes you should not only have the best signalling equipment but you must use

Northern Electric Railway Signal Wire

No conditions impose a severer test on wire than those used in connection with a railroad signalling system.

Northern Electric R.S.A. wire meets the R.S.A. specifications in every particular and goes a step further—it meets the more rigid Northern Electric specifications which gives you, the user, double protection.

Buy your wire and cable from the largest makers in Canada.

Northern Electric Company LIMITED

MONTREAL HALIFAX TORONTO WINNIPEG
REGINA CALGARY VANCOUVER



The Trained Man Wins

In the railroad business it's the *trained* man who wins. Carrying hundreds of millions of passengers every year, it is absolutely necessary that the responsible positions in railroading be filled with none but the most highly trained men. *Your* advancement will depend largely on the thoroughness of your training.

If you really *want* a better job and are willing to devote a little of your spare time to getting ready, the **International Correspondence Schools** can help you. More than two hundred of the railroad systems of the United States and Canada have indorsed the **I. C. S.** method of instruction and recommended it to their employes.

You're ambitious. You want to get ahead. Then don't turn this page until you have clipped the coupon, marked the line of work you want to follow and mailed it to the I. C. S. for full particulars. Doing so will not obligate you.

INTERNATIONAL CORRESPONDENCE SCHOOLS

Box 8409, SCRANTON, PA.

Explain, without obligating me, how I can qualify for the position, or in the subject, before which I mark X.

- | | |
|---|--|
| <input type="checkbox"/> Locomotive Engineer | <input type="checkbox"/> R. R. Agency Accounting |
| <input type="checkbox"/> Locomotive Fireman | <input type="checkbox"/> R. R. Gen'l Office Accounting |
| <input type="checkbox"/> Traveling Engineer | <input type="checkbox"/> Bookkeeper |
| <input type="checkbox"/> Traveling Fireman | <input type="checkbox"/> Stenographer and Typist |
| <input type="checkbox"/> Air Brake Inspector | <input type="checkbox"/> Higher Accounting |
| <input type="checkbox"/> Air Brake Repairman | <input type="checkbox"/> Mathematics |
| <input type="checkbox"/> Round House Foreman | <input type="checkbox"/> Good English |
| <input type="checkbox"/> Trainmen and Carmen | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> Railway Conductor | <input type="checkbox"/> Advertising Man |
| <input type="checkbox"/> Mechanical Engineer | <input type="checkbox"/> Civil Service |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> Railway Mail Clerk |
| <input type="checkbox"/> Machine Shop Practice | <input type="checkbox"/> Electric Engineer |
| <input type="checkbox"/> Boiler Maker or Designer | <input type="checkbox"/> Electrician |
| <input type="checkbox"/> Steam Engineer | <input type="checkbox"/> Electric Wiring |
| <input type="checkbox"/> Steam-Electric Engineer | <input type="checkbox"/> Electric Lightng |
| <input type="checkbox"/> Civil Engineer | <input type="checkbox"/> Telegraph Expert |
| <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> Mine Foreman or Engineer |
| <input type="checkbox"/> R. R. Constructing | <input type="checkbox"/> Weather Fore or Predictor |
| <input type="checkbox"/> Bridge Engineer | <input type="checkbox"/> Chemical Engineer |
| <input type="checkbox"/> Architect | <input type="checkbox"/> Accountant |
| <input type="checkbox"/> Architectural Draftsman | <input type="checkbox"/> Codes Building |
| <input type="checkbox"/> Contractor and Builder | <input type="checkbox"/> Automobiles |
| <input type="checkbox"/> Structural Engineer | <input type="checkbox"/> Auto Repairing |
| | <input type="checkbox"/> Italian |

Name _____
Occupation _____
& Employer _____
Street _____
and No. _____
City _____
State _____
Zip _____



NICKEL

Shot—High and low carbon.

Ingots—Two sizes, 25 lbs., 50 lbs.

Electrolytic Nickel—99.80 p.c.

Prime Metals for the Manufacture of Nickel Steel, German Silver, Anodes and all remelting purposes. Our Nickel is produced as Rods, Sheets, Strip Stock, Wire and Tubes.

We are **SOLE PRODUCERS** of this natural stronger-than-steel, non-corrodible alloy. Manufactured forms are Rods, Flats, Castings, Tubes, Sheets, Strip Stock and Wire.

Send Inquiries Direct to Us.

The International Nickel Co., 43 Exchange Place, N.Y.

**MONEL
METAL**
Reg. U.S. Pat. Off.

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. **BABBITS**. Miscellaneous Brass Castings for Railroads.
Works and Office: 69 Delorimier Avenue, MONTREAL, QUE.



The Merchant who orders Fruit Jar Rings, the Contractor who requires Belting, the Architect who uses Tiling and Matting, or the Engineer whose Valves and Pipes need Washers and Packings, will always find the greatest satisfaction when selections are made from the Dominion Rubber System products, because,

The Quality is dependable, and meets every possible requirement.

The Variety is wide enough to meet every possible demand.

The Value, no matter what the price or article, is the best within reach.

The Service is prompt and satisfactory, and there is no occasion for disappointment.

Back of all is the broad policy of the Dominion Rubber System to serve and please under all circumstances.

Write to our nearest Branch or direct to our Head Office for Catalogue and Prices.

Canadian Consolidated Rubber Co., Limited
Head Office, Montreal, P. Q.

28 "Service" Branches Throughout Canada.

Canadian Railway and Marine World

October, 1916.

The Handling of Railway Scrap or Salvage.

By E. J. McVeigh, General Storekeeper, Grand Trunk Railway System, Montreal.

The subject I try to deal with in this little paper is scrap or salvage. The word is so familiar that it might seem superfluous to define it here, and yet I have hopes that some may not know all that there is to know about it. I would be glad indeed if there are a few who know as little about it as a friend of mine in Ottawa. You will remember the great fire of 1898 that wiped out a considerable portion of the cities of Hull and Ottawa. In that year the price of scrap was at a high level, and scrap men from all over the North American continent gathered at Ottawa to bid against each other for the scrap that was lying in the track of this fire. Some of the monied men of the city became aware of what was going on and concluded that they would like to have a share of this business, so they selected my friend as their representative, loaded him down with money, and sent him out to buy scrap in competition with the experts who were swarming over the ground. My good friend proceeded to get busy, and was about to close a deal for a quantity of material when it occurred to him that he would call me up and ask my advice. When he told me what he was trying to do, and gave me the details of the deal that he was about to close, I asked him what he knew about scrap anyway, and his reply was, "Why, scrap is scrap, isn't it?" and then I begged him to come and see me before he went any further or the fellows that he was dealing with would not only have his clothes, but his shirt. After I had had an interview with him and told him a few things about scrap, he concluded that he would not put the experts out of business that year; and he returned the money to his friends, much to their disgust, as they had visions of large profits. These men were not aware of the fact that the scrap business of this continent is one of the best organized lines of trade that is carried on in the country, and is handled largely by experts, and these experts lost money on Ottawa scrap that year.

The word scrap does not, I am afraid, fully describe or cover the thing that we are dealing with. If you look in your dictionary you will find the definition of the word as "a small piece, fragment, or crumb," and as we proceed you will realize that the expression "small fragment or crumb" can hardly be properly applied in this case. The word as used in the railway world is supposed to cover all of our material that has been used for the purposes for which it was made, and discarded as of no further use in its then existing form, and must be returned to be made over into its original form or into some other form in which it can be made use of. It would be interesting to know just what this fragment or crumb amounts to. An ordinary American railway makes \$40 worth of miscellaneous scrap each year for each mile of road operated. We have

on the American continent 271,106 miles of railway, at \$40 a mile. This amounts to \$10,844,240; and we must add to these figures car wheels, discarded locomotives, released rail, structural steel and brass, which would bring our figures close to \$50,000,000. This is some fragment or crumb. The creation and sale of scrap by railways is, of course, no new thing. It has been going on ever since we had a railway. But it has never received from the railways themselves the attention that it deserved. It was one of the things that was everybody's business, and, as usual in such cases, it was nobody's business; and if we could today secure figures showing what the railways of America have lost through the careless handling of scrap, we would begin to understand why Mr. Brandeis got the idea that we were wasting a million dollars a day. The people of America are, I suppose, the greatest wasters the world has ever seen, and it was natural and human that they should be, because in the beginning there were a very few of us, and there was a very large country, and I believe the expression "inexhaustible resources" was coined in America. There is no more mischievous expression in the English tongue; it has been responsible for much of our foolish and wasteful ways.

We learned how to waste before railways came into existence, and we are only slowly unlearning that lesson, and in this matter of scrap we wasted probably a little more than along other lines. By multiplying the kind and class of locomotives and cars we created more scrap than we should have, and after it was created we did not handle it to the best advantage. In this world there are people always prepared to turn to their advantage their neighbors' mistakes, and the railways' neglect of their scrap has enriched many middlemen. Unfortunately the fortunes made by these men did not anywhere near represent the loss suffered by the railways, for the reason that in the scrap purchased by them was much good useable material that could not be used by others than the railway, and the middlemen made no more out of this than they did out of the material that was actually scrap.

The plan of handling and disposing of this material on the majority of American railways has been for the departments to send into the purchasing office an estimate of the quantities on hand at the various points, and the purchasing office would offer it for sale, depending entirely on the parties making the reports as to the correctness of the reports, and also depending on them for the proper loading of the material when the sale was made. As only carload lots could be sold there was generally at the end of the selling period as much scrap on hand as had been sold, and this was carried over from year to year to the railways' very considerable loss. Some years ago the Railway Storekeepers' Association took up this question very

seriously and appointed committees to study the matter and recommend proper methods of handling. One of the first things they did was to classify the scrap. This is divided under 98 headings, as follows:

[Editor's Note.—Space will not permit of printing the entire list, but the following headings are given as examples.]

- 1 Arch bars and transoms, iron.
- 2 Arch bars and transoms, steel.
- 3 Axles, iron. Driving and other axles, 6 in. diam. and over.
- 4 Axles, steel. Driving and other axles, 6 in. diam. and over.
- 5 Axles, iron. Car, tender, engine truck and other axles, car and locomotive, under 6 in. diam.
- 6 Axles, steel. Car, tender, engine truck and other axles, car and locomotive, under 6 in. diam.

A form for storekeepers to report on is supplied headed as follows:—

REPORT of SCRAP on HAND AVAILABLE
for SALE
At Storehouse 191...
Signed S.K.
Date 191...

Standard Classification
Railway Storekeepers' Association
No. DESCRIPTION. Quantity.

The form has the whole 98 headings printed on it, with description of the different items as shown in the specimen of headings given above. Storekeepers are required to fill out and send to the general storekeeper on the 4th of each month, reporting quantities in gross tons and including all scrap available for sale, except that for which sales orders are held. Barrels are reported by carload.

The next thing advocated by the association was the central scrap yard, where all scrap material would be collected and sorted, so that the best price possible would be secured at time of sale.

In this world we always have those who lead, those who follow, and those who refuse to do anything. In this matter of the central scrap yard one of the great roads of the United States has gone a little further than any other, and their experience should be an object lesson to every other road on the continent. The road that I refer to has over 6,000 miles of track, and they were so situated geographically that the best market for their scrap material was at one end of 6,000 miles of rail, but they did not hesitate to collect their scrap and bring it to this point. The first discovery they made was a startling one, which was that out of the enormous tonnage brought into this yard it was found that 40% was good useable material, and the value of this 40% as they selected it from the actual scrap amounted to \$175,000 a month. When this became known the departments became more careful in handling their material, and the good material found in the scrap gradually diminished, until today it amounts to only 6½% of the gross tonnage. In connection with this yard these people have established a salvage and manufacturing plant, and with even the small percentage of good useable

material that they now rescue from the scrap pile the yard is paying a net profit of \$25,000 a month. In addition to this they have their scrap sorted and classified, so that they secure the best possible price; and as this will average them from \$2 to \$4 a ton of an increase over what they would receive if the scrap was unsorted, the gross profit from this yard runs into very high figures indeed. I mention this road in particular for the reason that, as I said before, it has gone a little further than any other road on the continent in the handling of scrap and salvage, but other roads have established yards and gone a considerable distance along the same lines. In each case they have shown a good saving or profit, and you would think that with such data available every road in the country would have established yards by this time, but such is not the fact. Like all other questions pertaining to supply, our railways are inclined to side-step this thing and hope that it will work out its own salvation. "Where ignorance is bliss, it is folly to be wise," says the old saw, but where ignorance is loss it is well to get wise.

One of the most mischievous fallacies in the railway world is the idea that the man who uses the material would be the proper custodian of the material, and that the man who makes the scrap is the best man to handle it. Nothing could be more wrong than this. Would anyone with proper understanding claim that the man who throws good material into the scrap pile is the best possible man to take it out again? Good material finds its way to the scrap pile in various ways and for various reasons. Like every other evil thing in the world ignorance plays a large part in this game. But this is not the main reason. Men whose business it is to build and repair cars and locomotives like to have new material for their work, and the scrap pile is always handy to receive the second-hand material that they do not wish to use. Then again being human they frequently make mistakes and requisition for material that they do not require. Again the scrap pile comes in very handy as a grave wherein to bury their error. And as they have in the past not only made the scrap and placed it in the pile, but loaded it for sale, there has been no check on such actions and they have got away with it.

Had I made this statement some years ago it would naturally have been challenged by the men of the department, and it will be challenged today, but I can prove the statement. A few years ago I might have had difficulty in doing so without visiting various shops and inspecting the scrap pile, but today we have the records from the central scrap yards which prove that the condition was very much worse than any of us supposed. Let us look for a moment at a few of the items that are today being rescued from the scrap in the central yards:—Car replacers, coupler springs, locomotive springs, draft rigging, couplers, brake wheels, draw bar followers, nuts, bolts, knuckles, chainings, angle cocks, stop cocks, train line heads and nipples, steam heat heads and nipples, train line hose bag clips, steam hose clips, pulley blocks, shovels, picks, track bolts, track spikes, brake levers, brake cylinders, triple valves. These are a few of the items that are picked from the scrap that require little or no labor expended on them before they are turned back for use. But in addition to these there is much material, that can be worked over at small outlay and used in place

of material purchased, at much less cost.

Anyone going into the business of reclaiming material from the scrap pile must have a thorough knowledge of what he is doing, or he is liable to lose instead of make money for his company. Or to put it in another way, the handling of scrap is a man's job. The better the man the better he will have the job done, and I have yet to meet the man who knows all about it; and this reminds me of a little incident that occurred some months ago. I was discussing this business with a man who is probably the leading scrap dealer of Canada, and I remarked to him that I was sorry that I could not devote more time to this matter, as I did not yet know all there was to be known about it. His answer was, "Well, why should you expect to know all about scrap? Scrap is my business. I have been at it all my life. I do nothing else, and I am a long way from knowing all about it myself." Such a speech coming from such a man helps a fellow to bear up under the load of his own ignorance.

The railway storekeepers of America have been the pioneers in the effort to secure for the railways the full value of their scrap and in the movement that we call reclamation, meaning the reclaiming from the scrap pile material that could be used to advantage. In advocating the establishment of central yards to which all scrap on the railway would be brought for handling, we are up against the idea that to do this will mean extra expenditure. Now the storekeepers claim to be the economy men of our railways, and we would be very poor economy men indeed if we advocated spending money for which we received no return. We claim that we have proved beyond dispute that the central scrap yard is a money saver or a money maker. If all scrap originating on the road is sent to a central yard there is no further labor being spent on it than the mere loading on cars. The labor saved at the various outside points will be more than sufficient for handling the scrap in the yard. Then it has been found that the good useable material rescued from the pile always more than pays for the labor expended. If you add to this \$2 a ton in the selling price of your scrap properly sorted, you will need little further argument to prove that the central yard is a good proposition. If you want actual figures you have merely got to consider a yard that handled 30,000 tons of scrap in the year. If you increase the value of this scrap by \$1 a ton you have \$30,000. Double this and you have \$60,000. It is a bold man who will ask his company to spend money on new ideas, but with such figures as these to back us up we should have the courage to ask for what we require.

In establishing a central yard we should have a self-propelling crane with a magnet. This crane and magnet will do the work of about 30 men in the actual handling of material. But it would go further than that as it will shunt your cars and save the time of a shunting engine and crew. As the cars come into the yard the material should be unloaded with the crane and magnet on to one pile. From this pile it should be carefully sorted by hand and distributed in smaller piles, according to classification, the good useable material being removed at this time. Then when the scrap is sold the crane and magnet can load it again at the rate of 200 tons a day, and right here we can effect another large saving. By hand labor the loading of this 200 tons would cost us about

40c a ton. Loaded with the crane it would cost less than 10c. Some people claim to do it for less than 5c, but I want to be liberal and on the safe side. This will mean a further gain of 30c a ton; and while we are loading at the full capacity of the crane we are making \$60 a day, which would mean that we would pay for our crane in 166 days. How many pieces of machinery does a railway possess that would pay for itself in less time than this? Until the central yard is established we cannot use a crane and magnet for the loading of scrap, for the reason that the scrap is not sorted properly and must be sorted while being loaded. And this brings us to another phase of the question. In handling scrap under the old plan of having the department do the reporting, sorting and loading, we are constantly receiving claims for improper classification. That is, the receiver of the material will always claim the full amount for everything he finds in the car that is below the classification specified in the sale, and this claim must be allowed, and this is a loss that you can put into figures. But you hear nothing from the buyer for material that he finds in this load that is above classification, and this is a loss that you cannot put into figures and that you know nothing about.

In addition to the loss suffered through improper classification there is the other and greater loss that I have mentioned before of the good useable material that is thrown into the scrap by the mechanical people and, when the scrap is loaded by them, sent away to the buyer. What does this amount to? It is a hard question to answer. Most of us will say we don't know. The mechanical man will say it does not amount to anything; of course he will. It is the old plea of not guilty. But it so happens that I have a few figures that I can give you. The storekeepers of the railways in the United States and Canada are today, and have been for some years, helping each other out by passing along information. A friend of mine on a U. S. road had some 200 carloads of scrap to dispose of, and it was to be loaded by the mechanical men. He had been studying this matter and he asked that he be permitted to sort and load the material. He did not have a central yard. He was told never to mind, that the mechanical men had always done it and they could do it again. Well, they did it, but my friend was not happy. You all know the story of the Jew who was told that the ship he was on was sinking and he replied, "Vell, let it sink, it don't belong to me." This man was not built along these lines. He felt that his company was losing money, and he wanted to stop the leak; he wanted proof. So he stopped two of these 200 cars that had been loaded by the mechanical people and unloaded them with his own men. He sorted it and reloaded the cars, keeping out the good useable material, then listed up what he had got out of the two cars and priced it. The value of that material was just a little over \$1,800. From two cars taken at random out of a lot of 200. Now do a little figuring and see what the loss was. The two loads had been sold for less than \$1,800, and they contained that value of good material. Do you say that this was an exceptional case? Well then, how about the scrap yard that I mentioned before where they found that of the total tonnage coming in 40% was good material. This is, it seems, strong circumstantial evidence, and men are hanged on circumstantial evidence.

There is another phase of this scrap business that has not received the attention it should. The scrap pile tells a wonderful story of success or failure to those who study it. We buy material and use it. It gives us good, fair, or poor service. How many know about it? A few here and there. And quite frequently those who know consider it in their interest to hide that knowledge. And how are our officers to learn these things? They can't run around looking over all the little scrap piles on the system. But suppose we have a central yard. They can and should go there occasionally and see for themselves what is going on. The scrap yard should be in charge of the stores department, but representatives of all departments should visit it just as often as they can to learn things for themselves and help along the good work by giving the men in charge the benefit of their knowledge. They will be welcome as the flowers in May.

Now it may seem that I have cast reflections on the mechanical men in this matter. Well, I have nothing to take back, and could say much worse things than I have said or intimated. But we must look at things in a proper light or from a proper standpoint. The car man's business is to repair cars. The locomotive man's business is to repair locomotives. That is what he is paid for. If he does his work well he stays on the payroll. Is it any wonder then that he is interested in that work? And he has enough of such work to do to take up most of his physical and mental energy. How then can we expect him to take that interest in scrap that the matter deserves? He can't, and he won't. And when we ask and expect him to do it we, and not he, are to blame for the results. The handling of scrap is properly the work of the stores department. We give the mechanical men their new material, not always just as promptly as they want it of course, but we do give it to them. So let us take their old material from them and make the best possible use of it, put it in shape to receive the best possible price for it as scrap, or rescue the good material and turn it back to be used. When we send them their new material they catch our mistakes, if we ever make any? And when they return the old, we will catch theirs. All in the interest of the company we work for.

The railways of America have been for many years destroying old cars that have outlived their usefulness. Some roads in the extreme west have taken their old cars out in the mountains and dumped them into a gorge. There was a reason for this. They had no market for scrap out there, and they figured that to dismantle the cars, collect the scrap and haul it east would cost them more than the scrap was worth. Railways in the east and middle west have disposed of their old cars in various ways, but most of them have disposed of them by allowing their car department to destroy them by burning, the scrap to be sorted by the same department. Nine out of every ten men who do not understand this matter fully will say that is a good plan. The car man builds and repairs cars. He is just the man to destroy or dismantle them. Well, the nine men would be wrong. The stores department should do this work. Why? Because they are material men by training. Does that sound strange? Well, let me say something here that is not often thought of or spoken about. To become a thoroughly competent master car builder,

master mechanic, roadmaster or storekeeper on a railway a man must put in a number of years at his work that if put in at college and special training would make him a doctor, lawyer or college professor, and this applies to many other railway occupations in addition to the few mentioned. If this is true, and I think it is, then is it not only reasonable that the men with such training should do the work for which they have been trained. In other words, let the car man look after his cars, the locomotive man his locomotives, and keep them fit for use as long as possible. But when they are no longer of use as cars or locomotives they become material, to be sold or saved, and they should be returned to the material man. When the car people are called on to dismantle or destroy cars they look on it as an extra and disagreeable job to be got rid of as quickly as possible. They quite often have to use men at this work whose services they require elsewhere, and men to whom they pay more than laborers wages, while it is a job for laborers. Is it any wonder then that the thing is rushed through under the key note of destruction—let the tail go with the hide idea, rather than with the idea of reclamation, or save the tail and as much of the hide as possible?

There have been published recently two very interesting papers on this subject, one by a car man and one by a storekeeper, both from roads in the United States, and in these papers the car man and storekeeper agree for once, that the methods followed in the past in the destruction of old cars has been all wrong, and that if the cars are handled by the stores department the work will not only be done cheaper, but a very large saving be effected by the saving of useable material, and increased price procured for the scrap when saved from fire damage and properly sorted.

Referring to a paper I read before the Storekeepers' Association in 1912 I find I used this expression, "In considering anything we should first of all consider whether it is worth considering," and I believe we have established the fact that the scrap or salvage of our railways is well worth all the consideration we can give it. The creator of the world is above all creation because He can create. Man is above the rest of the animal world in that while he cannot actually create he can, and does, take the material furnished by the creator, and by the use of the talents given him combine and fashion these elements into the forms he requires, the forms suitable to his needs. In this he comes close to actual creation and rises to the point where he is just a little below the angels. In the combining of these elements and the fashioning of them to his needs is man's highest work. How far behind this highest is the work of him who, after these combined elements have served man's purpose in the forms in which he has fashioned them, stops them on their way to destruction and, with less labor and effort than first expended on them, returns them to man's use. Make no mistake about it, the scrap man is doing a wonderful work in the world. It is true he is not so highly regarded as the merchant who in his beautiful store sells at a profit that which other men brought into existence, but he is doing a more useful work, for he is saving something, and he is receiving his reward.

To go back to my paper of 1912 I find this: "How many of us can honestly say that in this matter of salvage we have

done all of the things we should have done, and left undone all of the things we should not have done. In other words, do we know that this part of our business has been handled to the best possible advantage? Is it not a fact that there has been a divided responsibility in this matter that has not tended to the best results? On whose judgment is much of our material put into the scrap pile, and just how thoroughly is that scrap pile culled over before it is delivered to the buyer? These are questions we should ask ourselves, consider them carefully, and answer honestly. We waste more or less, but as we gain knowledge we should waste less rather than more. Our railways do not waste more in proportion to the magnitude of their undertakings than do others in other branches of human effort, but we do waste. Fifty per cent. of all our loss and waste is the result of lack of education, the balance is pure 'cussedness.' This lack of education is not confined to any class or department. That we have insufficient storage facilities is due to lack of education on the part of our higher officials. They have not been educated up to see the necessity for them. The abuse of oil cans and tinware is due to pure cussedness on the part of those using them. The holding of valuable material by section men is due to lack of education or proper instruction. The loss in air and steam heat, hose and couplings is a combination of the two evils."

Further on in that paper I noted this, with reference to doing the salvage work: "Do not let us place such work in the hands of cheap men, men who do not know what they are doing. The best we have and the best we can get is none too good for this job, and no matter how good he may be he will still want the advice and assistance of the car man, the locomotive man and the storekeeper. We must guard against further waste in trying to effect a saving."

The economy game on a railway is a man's game. Any fool can spend money, the greater the fool the more money he can spend and the less he will get for it. But it takes a man and a wise man to save money for our railways, and we have but few men today who are fitted for the job. Some years ago one of the technical papers published an article in praise of a shop foreman who had made much money for his company by taking from the scrap pile 12-in. ends of 2-in. square steel and making coal hammers for locomotives out of them. This amused me so much that I wrote the editor, giving him the actual cost of a coal hammer made in this way, and gave him the cost of a coal hammer we were using. The foreman's hammer made from the square steel cost \$1.45. The hammer we were using at that time cost 10c. I also asked him if he thought I could buy this foreman's scrap pile where he had 12-in. pieces of tool steel. The editor asked me to please excuse him for not publishing my letter and figures, as he did not care to emphasize the fact that he had been as big a fool as the foreman who had misled him.

Not so very long ago I found a shop foreman making track cold sets from scrap tires. He was wasting money very fast by destroying good scrap by wasting coal and labor on it. You may hear men tell of making spanners from old steel crank pins. When you hear such talk stop and do a little figuring. A crank pin that would make a spanner would weigh 10 to 15 lb., as scrap it

would sell for say 8c. Now you use coal to heat it, labor to draw it out, shape it, and finish it off. Figure that all out and then look up the price of a spanner purchased. When you find that you can buy two spanners at the cost of making one out of a crank pin, you will likely say the whole business is a farce. But you would be wrong, it is not a farce, but some people go at anything wrong; they start out without sufficient knowledge, they see one end only. And that is why I say this is a man's game, an all-round man, a man who can see both ends and the middle, and still has a mind open to learn every day. Such men must be both born and made; they must have a natural bent toward economy and saving, and must have years of training on top of that. That is why I say we have few men today who are fitted for the job. But while we may laugh at some of the men who have got off on the wrong foot in the race, we must do so in all good nature, for after all they are the fellows

who have the right idea and will learn by their own mistakes. They are at least ahead of the man who does nothing, and there is a lot to be done.

To quote once more from my paper of 1912 on the conservation of waste: "This has been the age of steam; the signs of the times point to the fact that we are entering the age of electricity. I see on every side indications that we are going to repeat in the electrical age the same kind of mistakes we made in the age of steam. Must we do this? Can we make no advance without waste, fearful waste? Perhaps not, but we can at least try. Let us sound the warning in season and out of season. Let us learn the meaning of conservation and keep it before us always. Remember, it is not a fad; it is anything but that. It has come to stand for the life of the individual, the life of the railways, and the life of the nation."

The foregoing paper was read before the Canadian Railway Club recently.

Birthdays of Transportation Men in October.

Many happy returns of the day to:—

E. W. Beatty, K.C., Vice President and General Counsel, C.P.R., Montreal, born at Thorold, Ont., Oct. 16, 1877.

L. S. Brown, Superintendent, Truro, Sydney and Oxford District, Intercolonial Ry., New Glasgow, N.S., born at Nelson, N.B., Oct. 19, 1864.

R. A. Burford, cashier, C.P.R. ticket office, New York City, born at Brooklyn, N.Y., Oct. 4, 1878.

Lieut.-Col. G. E. Burns, ex-Freight Claims Agent, Eastern Lines, C.P.R., Montreal, now District Intelligence Officer, Military District No. 4, Montreal, born at St. Thomas, Ont., Oct. 6, 1863.

K. J. Burns, Assistant General Freight Agent, Great Northern Ry., Vancouver, B.C., born at Rochester, Eng., Oct. 11, 1878.

F. F. Busteed, C.E., formerly Engineer in charge of C.P.R. revision and second tracking, west of Calgary, Kamloops, B.C., born at Battery Point, Que., Oct. 10, 1858.

J. M. S. Carroll, District Manager, Canadian Consolidated Rubber Co., Montreal, born at Ballarat, Australia, Oct. 22, 1877.

C. E. Cartwright, M.Can.Soc.C.E., ex-Division Engineer, C.P.R., Vancouver, B.C., born at Toronto, Ont., Oct. 13, 1864.

A. F. Dion, Traffic Manager, Quebec Harbor Commission, Quebec, born at L'Islet, Que., Oct. 1, 1871.

L. V. Druce, Commercial Agent, G.T.R. and G.T.P.R., Vancouver, B.C., born at London, Eng., Oct. 20, 1873.

C. E. Dewey, Freight Traffic Manager, G.T.R., Montreal, born at Cheshunt, Eng., Oct. 2, 1873.

C. E. Friend, General Auditor, Canadian Northern Ry., Winnipeg, born at Brighton, Eng., Oct. 12, 1871.

W. P. Fitzsimmons, Commissioner of Industries, G.T.R., Montreal, born at Detroit, Mich., Oct. 27, 1868.

G. Hodge, Assistant to General Manager, C.P.R., Montreal, born there Oct. 2, 1874.

J. H. Hughes, Assistant Superintendent, District 4, Eastern Division, C.P.R., Ottawa, Ont., born at Charlottetown, P.E.I., Oct. 7, 1865.

H. Irwin, M.Can.Soc.C.E., Consulting Right of Way and Lease Agent, C.P.R., Montreal, born at Newgrove, County Down, Ireland, Oct. 27, 1847.

J. W. N. Johnstone, General Passenger Agent, Reid Newfoundland Co., St. John's,

Nfld., born at Campobello, N.B., Oct. 4, 1878.

W. M. Kirkpatrick, ex-Assistant Freight Traffic Manager, Eastern Lines, C.P.R., Montreal, now on active service, born at Kingston, Ont., Oct. 8, 1874.

W. B. Lanigan, Assistant Freight Traffic Manager, Western Lines, C.P.R., Winnipeg, born at Three Rivers, Que., Oct. 12, 1861.

J. W. Leonard, General Manager, Toronto Terminals Co., Toronto, born at Epsom, Ont., Oct., 1858.

Sir William Mackenzie, President, Canadian Northern Ry., Toronto, born at Kirkfield, Ont., Oct. 30, 1849.

C. Malcolm, chief clerk, Auditor of Stores and Mechanical Accounts, Alberta Division, C.P.R., Calgary, Alta., born at Tatamagouche, N.S., Oct. 18, 1881.

W. T. Marlow, Import Freight Agent, C.P.R., Montreal, born at Limerick, Ireland, Oct. 25, 1872.

R. Marpole, General Executive Assistant, C.P.R., Vancouver, B.C., born in Montgomeryshire, Wales, Oct. 9, 1850.

C. R. Moore, Assistant to Vice President, Construction, Operating and Maintenance, G.T.R., Montreal, born at Hamilton, Ont., Oct. 12, 1867.

Hugh Paton, President, Shedden Forwarding Co., Montreal, born at Johnstone, Renfrew, Scotland, Oct. 5, 1852.

J. W. Porter, Chief Engineer, Hudson Bay Railway, Winnipeg, born at Aberdeen, Scotland, Oct. 15, 1877.

D. Pottinger, I.S.O., ex-Assistant Chairman, Government Railways Managing Board, Moncton, N.B., born at Pictou, N.S., Oct. 7, 1843.

T. F. Rahilly, acting Trainmaster, Algoma Central & Hudson Bay Ry., Sault Ste. Marie, Ont., born at Diorite, Mich., Oct. 6, 1892.

H. G. Reid, Master Mechanic, District 3, National Transcontinental Ry., Transcona, Man., born at Pembroke, Ont., Oct. 27, 1863.

A. G. Richardson, District Passenger Agent, C.P.R., Winnipeg, born at Rockford, Ill., Oct. 16, 1880.

W. S. Rollo, joint agent, G.T.R., and Central Vermont Ry., St. Johns, Que., born at Dundee, Scotland, Oct. 8, 1852.

J. K. Savage, Superintendent, District 1, Saskatchewan Division, C.P.R., Regina, born at Forreston, Ill., Oct. 5, 1876.

Lord Shaughnessy, K.C.V.O., President, C.P.R., Montreal, born at Milwaukee,

Wis., Oct. 6, 1853.

T. Duff Smith, Fuel Agent, Grand Trunk Pacific Ry., Winnipeg, Man., born at Barking, Essex, Eng., Oct. 2, 1868.

F. Stamelen, Night Locomotive Foreman, C.P.R., Winnipeg, born at Chatham, Ont., Oct. 16, 1863.

E. Sterling, Superintendent, Districts 2 and 3, British Columbia Electric Ry., New Westminster, born at Thornbury, Ont., Oct. 3, 1875.

C. E. Stockdill, Assistant to Vice President and General Manager, Western Lines, C.P.R., Winnipeg, born at London, Ont., Oct. 25, 1881.

E. N. Todd, Division Freight Agent, Eastern Division, C.P.R., Montreal, born at Huntington, Que., Oct. 17, 1879.

J. H. Valteau, Secretary-Treasurer, Thousand Islands Ry. and Oshawa Ry., Gananoque, Ont., born at Selby, Ont., Oct. 14, 1889.

A. W. Wheatley, President, Lima Locomotive Corporation, Lima, Ohio, born at Ashford, Kent., Eng., Oct. 12, 1870.

Canadian Pacific Railway Mileage.

Following are the mileages as at June 30:—

Included in C.P.R. traffic returns	12,993.6
Other lines worked	383.6
	13,377.2
Minneapolis, St. Paul & Sault Ste. Marie Ry.	4,228.3
Duluth, South Shore & Atlantic Ry.	627.7
	4,856.0
	18,233.2

Canadian Pacific Railway Pension Fund.

Following is a statement as at June 30, 1916:—

Balance to June 30, 1915	\$585,548.13
Contributed by company for year	125,000.00
Received as interest	43,609.82
	\$754,157.95
Payment of pension allowances for year	240,222.94
Balance in cash and investments	\$513,935.01
NUMBER ON PENSION ROLL, JUNE 30, 1916.	
Under 60 years of age	60
Between 60 and 70 years of age	445
Over 70 years of age	329
Total	834

Pacific Great Eastern Ry. Investigation.—H. C. Brewster, leader of the Liberal party, which carried the British Columbia provincial election recently, is reported to have said in a press interview:—"We will investigate the Pacific Great Eastern Ry. finances and have a strict accounting of every dollar of public money that has been spent in connection with that road, with the idea of recovering as much as possible of all that has been mis-spent."

The Traveling Engineers' Association's annual convention, which was to have been held at Chicago, Ill., Sept. 5 to 8, was postponed to Oct. 24 to 28, the Secretary, W. O. Thompson, Cleveland, Ohio, issuing a circular stating that on account of the serious labor conditions in progress with the four brotherhoods, the executive committee deemed it wise to postpone the meeting.

Protection for Car Men from the Weather.—The Regina, Sask., Trades and Labor Council has passed a resolution calling upon the Trades and Labor Congress of Canada, to take up with the Board of Railway Commissioners the protection of railway car men from the inclemency of the weather.

Railway Mechanical Methods and Devices.

Oxy-Acetylene and Electric Welding in Winnipeg Shops, C.P.R.

The following information, with the accompanying illustrations, will give a good idea of the extent to which the above mentioned methods have been adopted in the C.P.R.'s Winnipeg shops and the amount of saving effected:—

from the road on account of worn crossing points. The parts whitened were built up by an oxy-acetylene operator, rail metal being fed in in the building up process. The entire cost of repair was \$19.70, while the original diamond

the worn place and plane it off costs only \$5.

Fig. 4 shows a patch inside a locomotive in position ready for the welder; the crack was whitened to show it up. It will be particularly noted that the

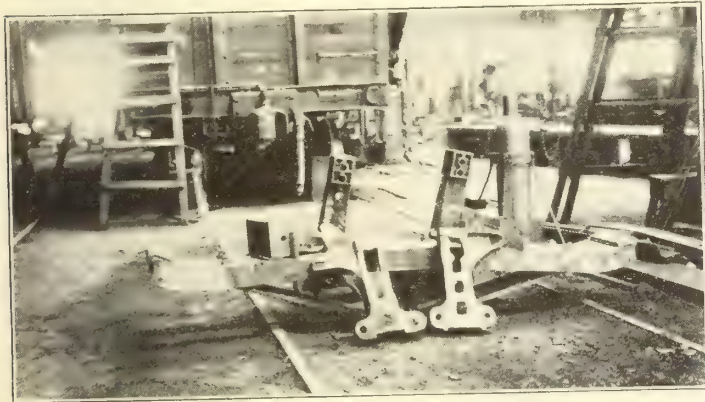


Fig. 1. Welding Work in Steel Car Shop.

The following description with the accompanying photographs will give an idea of the extent of the application that we have arrived at and the amount of saving effected.

Fig. 1, from a photograph taken in the steel car shop, shows a representative group of work handled by this department. Column castings seen in the foreground of the photograph show the extent of the wear on the faces, in fact the face is worn right through. By welding a plate on these faces the casting is made equal to a new one at a cost of 48% of the price of a new one.

Bolsters are similarly repaired, where before the application of oxy-acetylene or electric welding they were scrapped. The same photograph shows a bolster that has been welded up, which cost \$32.40 when new and \$10.60 to repair. This repair cost includes cost of new castings and repairs to bottom strap as well as the welding. This is less than one-third of the original cost.

The two couplers shown standing in the background (unfortunately the



Fig. 2. Welded Track Diamond.

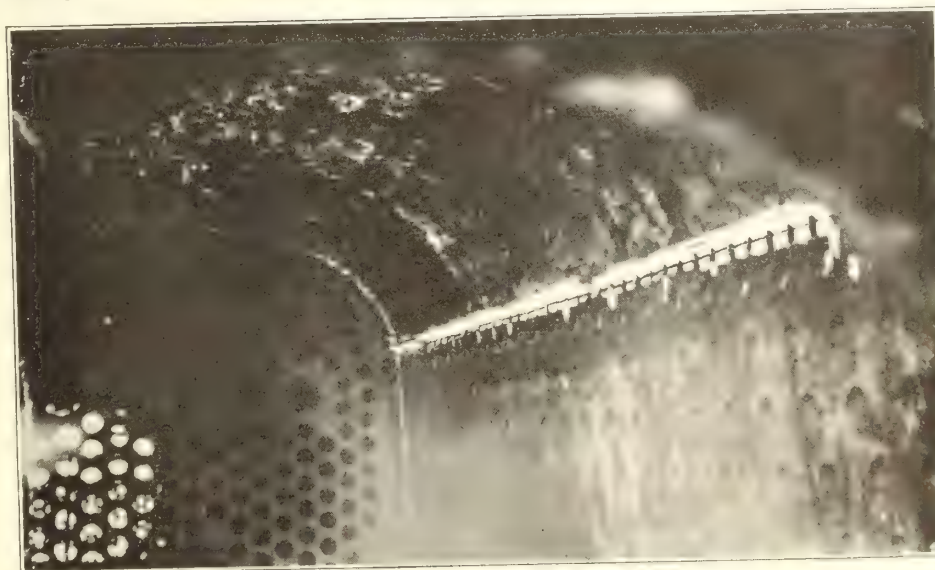


Fig. 5. Sheet Inside Fire Box Ready for Welding.



Fig. 3. Welded Track Frog.

wrong way up) represent a large industry in itself. Cracks are welded and lugs that are broken off are welded up again, and the whole from service test is equal to new.

Fig. 2 shows a track diamond taken

cost over \$250.

Fig. 3 shows a track frog 85-lb. rail. It is a similar example of the saving brought about by oxy-acetylene welding. To repair the frog by renewing the rails would cost \$29.70, whereas to build up

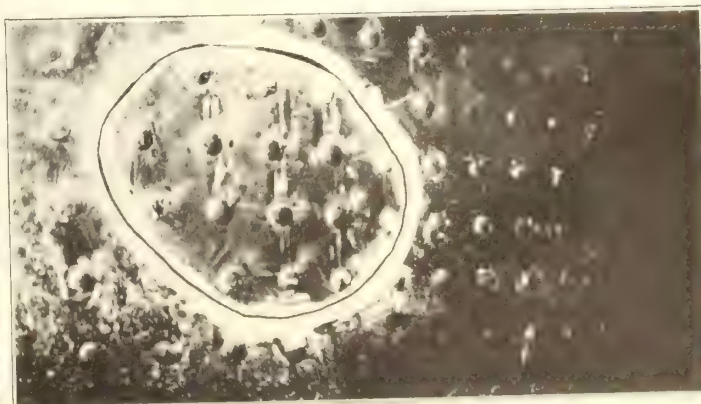


Fig. 4. Welded Patch Inside Locomotive.

patch is permanently riveted in position and that no allowances for drawing are made. We have found this method entirely successful.

Fig. 5 shows a side sheet inside a fire-box ready for welding. It will be noted

here also that the drawing of the plate has been entirely and successfully neglected.

For the foregoing information and for the photographs from which the illustrations were made we are indebted to R. A. Pyne, until recently Superintendent of Shops, C.P.R., Winnipeg, and Superintendent Motive Power and Car Department, Eastern Lines, Montreal.

Racks for Holding Triple Valves.

Some very serviceable racks for triple valves built in the C.P.R. passenger car shops air brake department, at Vancouver,



Racks for Holding Triple Valves.

ver, are shown in the accompanying illustration. They are built entirely of scrap. The measurements of each rack over all are 9 ft. long x 21-3 ft. wide x 5 ft. high, carrying four tiers or rows of valves placed lengthwise on the rack. One rack is used for valves to be cleaned and repaired and the other for those in good order.

The frame is of 3-in. angle iron riveted to an upright of the same material. The centre braces are of 1-in. iron pipe, 2 braces to each tier, with a $\frac{5}{8}$ -in. rod running lengthwise through the pipe and fastened with nuts on the outside ends, which make the rack quite rigid.

The capacity of each rack is 130 valves, and their use eliminates having to pile valves on the floor. We are indebted to T. Spence, General Car Foreman, C.P.R., Vancouver, for the foregoing information and for the photograph.

Railways' Coal Consumption.—United States railways in 1915 consumed 24% of the country's total coal production. Practically all of the 600,000 tons of anthracite and 62,700,000 tons of the 128,200,000 tons of soft coal consumed by railways were burned in the eastern district. Railways of the Western district burned 43,500,000 tons, and those of the southern district 22,000,000 tons.

The C.P.R. was reported from Raymond, Alta., Sept. 2, to be negotiating with the night-Svegan Co., for the purchase of its factory and plant there, which has been closed for some time.

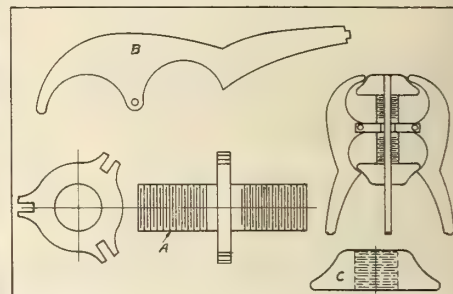
Auxiliary Chuck for Turning Piston Packing Rings.

The auxiliary chuck, the separate parts of which are shown herewith, is being used in the G.T.P.R. shops at Biggar, Sask., for holding piston gland packing rings in the lathe while they are being turned. The completed chuck is made up of a centre stem A, enlarged at the centre to form a fulcrum for the three arms B, which take the packing rings. The arms are controlled by the movement of the cones C, placed on either end of the centre stem, which is threaded at both ends for their adjustment. The

tapered shank can be held in the centre bore of the spindle, and keeps the work far enough away from its face so that better work can be accomplished. For details of this device we are indebted to W. W. Yeager, Locomotive Foreman, G.T.P.R., Biggar, Sask.

Cleaning Water Filters in C.P.R. Passenger Car Shops.

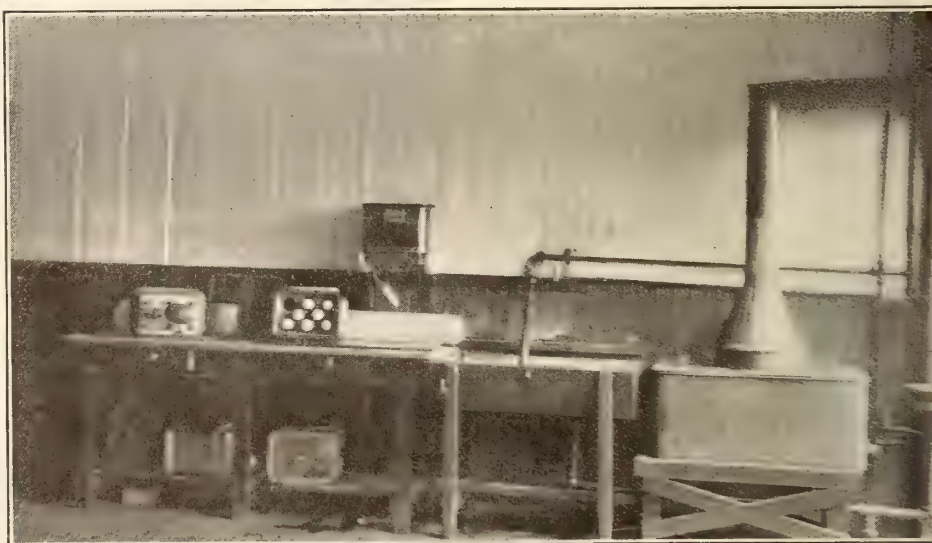
In the C.P.R. passenger car shops at Vancouver the dining car water filters are taken apart on a bench or table, which is lined with tinned sheet copper and drains to a sink in the centre. The inside filters are removed and entirely



Auxiliary Chuck for Turning Piston Packing Rings

washed out with warm water, after which they are sterilized in a copper tank, heated with live steam. The filters are then reassembled and tested with water pressure before being returned to the cars. We are indebted to T. Spence, General Car Foreman, C.P.R., Vancouver, for the foregoing information and for the photograph.

The Flying Train Failure.—A few years ago the Batchelet Flying Train & Levitated Railways Syndicate was formed in England, to build and operate systems of levitated railways. An order has now been made for the winding up of the company and a liquidator has been ap-



Cleaning Water Filters in C.P.R. Passenger Car Shops.

ends of the arms which take the packing rings are each made with a lip on the end so that they will grip the rings either from the inside or the outside, thus enabling the ring to be turned completely by two adjustments of the chuck. When the inside and one end is turned the chuck is readjusted to the inside, and the outside and opposite end are turned. This appliance is easily held in the ordinary lathe chuck, or by adapting a Morse

pointed. The idea was based on the application of the principle of electro-magnetic repulsion. The "track" was represented by a series of electric coils with horseshoe shaped solenoids at regular intervals. On these coils being energized, the cigar-shaped aluminium carriage was repelled from the "track," and by similar means, propelled from point to point. It was claimed that a safe speed of 300 miles an hour could be attained.

Canadian Pacific Railway Company's Annual Report.

Following is the report for the year ended June 30, addressed to the shareholders over the signature of the President, Lord Shaughnessy:—

The accounts for the year ended June 30 show the following results:—

Gross earnings	\$129,481,885.74
Working expenses	80,255,965.28
Net earnings	\$49,225,920.46
Deduct fixed charges	10,306,196.06
Surplus	\$38,919,724.40
Contribution to pension fund.....	125,000.00

Deduct net earnings of Pacific Coast steamships, commercial telegraph, and news department, transferred to special income account	\$38,794,724.40
	1,923,288.96
	\$36,871,435.44

From this there has been charged a half yearly dividend on preference stock of 2%, paid April 1..	\$1,613,638.42
And 3 quarterly dividends on ordinary stock of 1¼% each, paid Dec. 31, April 1 and June 30.....	13,650,000.00
	15,263,638.42
	\$21,607,797.02

From this there has been declared a second half yearly dividend on preference stock, payable Oct. 1	\$1,613,638.42
And a fourth quarterly dividend on ordinary stock 1¼%, payable Oct. 1.	4,550,000.00
	6,163,638.42

Leaving net surplus for the year.. \$15,444,158.60

In addition to the above dividends on ordinary stock, 3% was paid from special income.

Following are details of special income for the year:—

Balance at June 30, 1915	\$8,216,144.15
Less dividend paid Oct. 1, 1915	1,950,000.00
	\$6,266,144.15
Interest on proceeds land sales.....	151,170.51
Interest on deposits and loans.....	976,326.08
Interest from Minneapolis, St. Paul and S.S. Marie Ry. bonds.....	159,720.00
Interest from Mineral Range Ry. bonds	50,160.00
Interest from Toronto, Hamilton & Buffalo Ry. bonds	10,237.78
Interest from Montreal & Atlantic Ry. bonds and other securities.....	108,136.03
Interest from Berlin, Waterloo, Wellesley & Lake Huron Ry. bonds.....	17,040.00
Interest from St. John Bridge & Ry. Extension Co. bonds	6,250.00
Interest from Esquimalt & Nanaimo Ry. bonds	193,280.00
Interest from Dominion Atlantic Ry. extension debenture stock	56,940.00
Interest from Dominion Atlantic Ry. 2nd debenture stock	36,986.67
Interest from Hull Electric Ry.	60,000.00
Dividend on St. John Bridge & Ry. Extension Co. stock	70,000.00
Dividends on Minneapolis, St. Paul & S.S. Marie Ry. common stock	890,645.00
Dividends on Minneapolis, St. Paul & S.S. Marie Ry. preferred stock	445,326.00
Dividends on West Kootenay Power & Light Co. common stock	27,500.00
Dividends on West Kootenay Power & Light Co. preferred stock	3,850.00
Dividends on Consolidated Mining & Smelting Co. stock	307,437.50
Dividend on Berlin, Waterloo, Wellesley & Lake Huron Ry. stock	12,500.00
Earnings from ocean steamships and hotels	3,583,292.28
Revenue from interest in coal mine properties	557,842.72
Extraneous mail earnings	216,305.07
Net earnings of Pacific Coast steamships, commercial telegraph, news department	1,923,288.96
Space rented in office buildings	76,720.34
	\$16,207,099.09

Less:—Payments to shareholders in dividends:

Dec. 31, April 1, and June 30.. 5,850,000.00

\$10,357,099.09

From this a dividend has been declared payable Oct. 1, 1916..... 1,950,000.00

The working expenses for the year were 61.98% of the gross earnings, and the net earnings 38.02%, compared with 66.04 and 33.96%, respectively, in 1915.

There were no sales during the year of 4% consolidated debenture stock, preference stock or other capital securities.

The sales of agricultural land during the year were 390,715 acres for \$6,126,108.00, an average of \$15.68 an acre. Included in this area were 8,046 acres of irrigated land which brought \$54.67 an acre, so that the average price of the balance was \$14.86 an acre.

You will be asked to give approval to an agreement between the New York Central, Michigan Central, and Canada Southern Railway Companies and your company, and the Toronto, Hamilton & Buffalo Ry. Co., which, in addition to providing for the interchange of traffic passing over the latter company's lines, provides for the issuance by the T., H. & B. Ry. Co. of 1st mortgage consolidated bonds not exceeding \$10,000,000, bearing interest not in excess of 5% a year, to be issued only with the consent of the other companies, parties to the agreement, and to be unconditionally guaranteed as to principal and interest by these companies jointly and severally.

In consequence of the extraordinary conditions created by the present war your directors considered it advisable to postpone the effective date of the agreement entered into between your company and the Allan Line Steamship Co. and the Canadian Pacific Ocean Services, Ltd., authorized by resolution passed at the last annual meeting, for the acquisition by the last named company of the capital stock of the Allan Line now held by your company and of the vessels of your company named in the resolution. Your directors have, however, though it desirable to enter into an agreement with the Canadian Pacific Ocean Services, Ltd., under which the vessels of both fleets are operated by that company as managers and agents. In view of possible changes in the conditions pertaining to ocean traffic, your directors consider it may be advisable, in your company's interests, that in giving effect to the proposals previously approved a somewhat different plan should be adopted, and a resolution will be submitted granting authority to your directors to carry out the transaction with the C. P. Ocean Services or some other company created for that purpose, of which company your company will have full ownership and control in such manner and on such terms as seem to them proper. The revenue from your steamships given in the statement of special income is exclusive of an amount transferred to the reserve account to cover the cost of replacing ships sold or destroyed, and of a sum sufficient to meet any tax on excess profits that may be ultimately payable.

The relations between the Consolidated Mining & Smelting Co. and the West Kootenay Power & Light Co. were such as to make it desirable, in the interest of both properties, that they should be under one control, and in order that this might be accomplished, your company joined with the other shareholders in the West Kootenay Power & Light Co. in exchanging its holding of common stock in that company for shares in the Consolidated Mining & Smelting Co. on a basis of \$75 of the stock of the Consolidated Co. for each \$100 face value com-

mon stock of the West Kootenay Co.

Your directors appropriated for expenditure on capital account in the calendar year \$3,749,474. Of this, \$1,955,000 was required for the Connaught tunnel in the Selkirk Mountains, and the balance for miscellaneous works of improvement over the whole system.

The profits resulting from the manufacture in your company's shops of munitions of war undertaken at Government request, have not been taken into the operating revenue, but have been applied as a set off against contributions to patriotic and relief funds, and other expenditures by your company directly due to the war and not properly chargeable to working expenses.

The important falling off in the revenue per ton mile for the carriage of freight traffic from 0.76 cents in 1915 to 0.64 cents this year, was largely due to the abnormal increase in the tonnage of grain handled at the very low rates that apply to that commodity, although the reduction in many tariff rates in Western Canada had considerable influence.

There being some doubt as to the right of the company to issue its preference and debenture stocks in dollar currency as well as sterling, the requisite authority to do so was secured by act of Parliament at the last session.

In Nov. 1915 the trustees under the mortgage securing £7,191,500 first mortgage bonds executed a discharge of mortgage and re-conveyance of the property to the company, and the documents have been deposited with the Secretary of State at Ottawa.

E. W. Beatty, K.C., Vice President and General Counsel, was elected a director to fill the vacancy caused by the resignation of D. McNicoll.

The following directors will retire from office at the approaching annual meeting. They are eligible for re-election.—W. D. Matthews, A. M. Nanton, George Bury.

Assets.	
Railway	\$352,971,897.76
Rolling stock equipment	153,605,367.56
Ocean, lake and river steamships.....	24,211,711.53
	\$530,788,976.85
Acquired securities (cost)	111,793,714.53
Advances on lines and steamships under construction	42,852,519.99
Advances and investments	9,639,472.07
Deferred payments on lands and townsites sales	12,006,140.61
Special Investment Fund:	
Deferred payments on lands and townsites \$39,044,383.42	
Government securities	10,088,734.86
Deposited with trustee	7,135,650.56
	\$6,268,768.84
Material and supplies on hand...	11,841,458.84
Agents' and conductors' balances..	1,819,709.40
Net traffic balances	512,056.88
Miscellaneous accounts receivable..	8,737,605.83
Temporarily invested in war loans	5,272,690.63
Cash in hand	41,581,680.69
	\$69,738,327.27
Other assets, mining stock, Hull Electric Ry., collieries, lands, etc.	1,171,411.11
	\$70,909,738.38

Liabilities.	
Ordinary stock	\$8,560,000.00
Four per cent. preference stock....	80,681,921.12
	\$89,141,921.12
Four per cent. consolidated debenture stock	176,284,882.16
Algonia Branch 1st Mortgage 7½% bonds	3,650,000.00
Note certificates	5,200,000.00
Premium on ordinary capital stock sold	15,000,000.00
Audited vouchers	3,185,000.00
Pay rolls	4,700,748.32
Miscellaneous accounts payable ..	6,536,269.10
Accrued rental of leased lines and coupons on mortgage bonds	631,658.90

Equipment obligations	11,680,000.00
Interest on replacement	4,978,627.79
Steamship replacement	5,384,028.92
Reserve fund for contingencies and for contingent war taxes	14,103,178.79
Marine insurance fund	335,960.86
Net proceeds lands and townsites	68,255,803.19
Surplus revenue from operation	100,604,596.60
Surplus in other assets	121,215,174.14
	\$960,217,057.89

Receipts, Year Ended June 30.

Cash in hand, June 30, 1915	\$17,055,269.63
Surplus revenue	36,871,135.44
Special income	9,940,954.94
Lands and townsites:	
Proceeds of sales and interest	\$7,269,112.38
Deferred payments on previous years' sales	3,386,938.07
	\$10,656,050.45
Less amount remaining in deferred payments on year's sales	5,677,002.59
	\$4,979,047.86
Less sale expenses and irrigation	1,872,665.35
Gimli extension subsidy	3,106,382.51
	80,032.00
	\$67,054,074.52

Agents' and conductors' balances	\$1,819,709.40
Net traffic balances ..	512,056.88
Miscellaneous accounts receivable	8,737,605.83
Advances on lines and steamships under construction ..	42,852,519.99
Advances and investments	9,639,472.07
	\$63,561,364.17
Amount at June 30, 1915 ..	65,079,065.69
	1,517,701.52
	\$68,571,776.04

Expenditures.

Dividends on preference stock	\$3,227,276.84
Dividends on ordinary stock	26,000,000.00
Construction of branch lines	64,318.97
Additions and improvements, main line and branches	2,778,655.38
Additions and improvements, leased and acquired lines	204,329.18
Rolling stock equipment	10,304.83
Shops and machinery	14,963.89
Purchase of steamship	
Mattawa	\$486,666.67
Payments on account of steamships under construction ..	386,483.43
	\$873,150.10

Less amount paid from steamship replacement ..	870,032.05
	3,118.05

Redemption of balance of 1st Mortgage 5% bonds	2,749,180.00
Deposited with trustee of special investment fund	5,803,233.15
Securities acquired:	
Shuswap & Okanagan Ry. bonds ..	109,887.50
St. John Bridge & Ry. Extension Co. bond	1,000.00
Great North West Central Ry. stock ..	30,000.00
Kingston & Pembroke Ry. stock ..	200.00
Consolidated Mining & Smelting Co. stock ..	145,250.00
Payment of equipment obligations ..	1,100,000.00
	\$42,241,717.79

Deduct decrease in material and supplies on hand	3,915,021.65
	\$38,326,696.14

Deduct increase in liabilities:	
Current liabilities ..	\$15,511,225.47
Interest on funded debt ..	531,658.91
Reserves and appropriations ..	24,801,796.36
	\$40,844,680.74

Amount at June 30, 1915 ..	24,235,389.32
	16,609,291.42
	\$21,717,404.72
Temporarily invested in war loans ..	5,272,690.63
Cash in hand	41,581,680.69
	\$68,571,776.04

Earnings for Year Ended June 30.

Passengers ..	\$24,690,652.19
Freight ..	89,654,405.19
Mails ..	1,384,567.43
Sleeping cars, express, telegraph and miscellaneous ..	13,752,260.93
Total ..	\$129,481,885.74

Working Expenses for Year Ended June 30.

Transportation expenses	\$38,915,381.50
Maintenance of way and structures ..	14,671,791.20
Maintenance of equipment	16,695,955.87
Traffic expenses	2,798,699.40
Parlor and sleeping car expenses ..	990,410.87
Expenses of lake and river steamships ..	829,811.73
General expenses	4,014,753.69
Commercial telegraph	1,339,161.02
Total ..	\$80,255,965.28

Surplus Income Account, June 30.

Balance at June 30, 1915	\$83,019,483.06
Net earnings of railway ..	\$36,871,435.44
Special income	9,940,954.94
	46,812,390.38
	\$129,831,873.44

Less dividends on preference stock	\$3,227,276.84
Less dividends on ordinary stock	26,000,000.00
	29,227,276.84
	\$100,604,596.60

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were drawn.

General order 171, Aug. 1.—Directing that railway companies equip certain locomotives with handrails on sides of cabs above windows near top of cab, and tenders with railing on both sides. This order is given in full on another page.

25298, Aug. 19.—Approving agreement between Bell Telephone Co. and Rydal Bank Telephone System, Aug. 15, 1914.

25299, Aug. 21.—Authorizing Blenheim Tp., Ont., to build McLaren drain under G.T.R. on Lot 8, Con. 5.

25300, Aug. 21.—Extending to Oct. 21 time for C.P.R. to build branch at mileage 67.6, London Subdivision, Ont., authorized by order 25176, July 17.

25301, Aug. 21.—Ordering Canadian Northern Ry. to provide proper ditches at subway in Cons. A and 1, Ottawa Front, Nepean Tp., Ont., work to be done by Sept. 15.

25302, Aug. 22.—Ordering Lake Erie & Northern Ry. to commence forthwith and complete within 60 days work ordered by order 19807, Apr. 16, 1913, in connection with location from Lorne Bridge, Brantford, to Main St., Galt, Ont.

25303, Aug. 22.—Authorizing C.P.R. to build spur for Ayers, Ltd., Lachute, Que.

25304, Aug. 23.—Authorizing Bosanquet Tp., Ont., to build south boundary drain under G.T.R. at mileage 143.84, District 15.

25305, Aug. 23.—Authorizing G.T.R. to build branch to connect with siding for Dominion Steel Foundry Co., Hamilton, Ont.

25306, Aug. 21.—Approving agreement between Bell Telephone Co. and Halton Telephone Co., Halton, Ont.

25307, Aug. 23.—Authorizing C.P.R. to make diversion in lieu of road allowance on south boundary of Sec. 13, Tp. 18, R.33, w.p.m., Sask., and to close same within its right of way.

25308, Aug. 23.—Approving plan, profile and book of reference combined showing siding to be built for J. H. Theoret, St. Eustache, Que.

25309, Aug. 23.—Relieving Niagara, St. Catharines & Toronto Ry. from providing further protection at crossing 19 between lots 244 and 252, Thorold, Ont.

25310, Aug. 23.—Amending order 25265, Aug. 26, re G.T.R. track arrangement across Albert St.,

Oshawa, Ont.

25311, Aug. 21.—Approving agreement between Bell Telephone Co., and Blind Line Telephone Co., Aug. 4.

25312, Aug. 24.—Authorizing Canadian Northern Ry. to build bridge over Old Man River in s.e. ¼ Sec. 13, Tp. 9, R. 26, w. 4 m., Alta.

25313, Aug. 17.—Dismissing complaint of H. Miles, Point Fortune, Que., against unloading charge of \$1 a car at Hochelaga stock yards and charge of 75c. a car for cleaning and disinfecting live stock cars as charged by C.P.R.

25314, Aug. 23.—Approving proposed location of Canadian Northern Ry. station at Bienfait, Sask.

25315, Aug. 25.—Approving Canadian Northern Ontario Ry. location, mileage 1.88 to 2.00, from Port Arthur, Ont., and temporary connection with spur to water front.

25316, Aug. 19.—Ordering C.P.R. to install automatic bell at crossing of St. Francois St., Rigaud, Que.

25317, Aug. 24.—Authorizing Canadian Northern Ry. to cross and divert road allowance between Secs. 20 and 29, Tp. 21, r. 12, w. 3 m.

25318, Aug. 18.—Ordering Atlantic, Quebec & Western Ry. to stop trains on flag at Little River East, Que., and approving location of shelter and platform there.

25319, Aug. 25.—Relieving C.P.R. from providing further protection at crossing of Dundas St., Cooksville, Ont.

25320, Aug. 25.—Extending to Oct. 25, time for installation by G.T.R. of gates at the crossings of Waterloo and Colborne Sts., London, Ont.

25321, Aug. 25.—Rescinding orders 17282, Aug. 22, 1912, and 20212, Aug. 28, 1913, which approved revised location of C.P.R. Crownest Pass Branch between Seven Persons and Grassy Lake, mileage 15 to 53.1, Lethbridge Subdivision, Alta.

25322, Aug. 30.—Suspending, until further order, Tariffs, C.P.R. C.R.C. no. E-3176, and Temiscouata Ry. C.R.C. 256, effective Sept. 1, on turnips and potatoes, from points in Maritime Provinces to stations in Ontario and Quebec.

25323, Aug. 26.—Authorizing G.T.R. to build siding to Harrolds Coal Co.'s premises, Toronto.

25324, Aug. 26.—Authorizing C.P.R. to build spur for Canada Iron Corporation, Three Rivers, Que.

25325, Aug. 22.—Amending order 25132, July 4, re building of highway over C.P.R. by Harriston municipality, Man.

25326, Aug. 24.—Amending order 25259, Aug. 5, re protection of Drouillard Rd. crossing, Walkerville, Ont., by G.T.R. watchmen, by substituting Ford City for Walkerville.

25327, Aug. 29.—Approving supplement 1 to C.P.R. Standard Mileage Freight Tariff, C.R.C. no. W-1948.

25328, Aug. 29.—Extending time within which Canadian Northern Ontario Ry. complete opening up of Second Concession Road allowance over its right of way in Goulbourn Tp., Carleton County, Ont., until such time as Goulbourn Tp. has done its part of work in opening up concession line and notified railway company, when company shall proceed with work over railway tracks.

25329, Aug. 30.—Authorizing G.T.R. to build siding, and spurs therefrom, to Harris Abattoir Co.'s premises, Toronto.

25330, Aug. 30.—Authorizing Windsor, Essex & Lake Shore Rapid Ry. to build spur for Champion Brick & Tile Co., Lot 265, South Talbot Road, Gosfield North Tp., Ont.

25331, Sept. 1.—Authorizing Canadian Northern Ry. to cross and divert highway between Secs. 10 and 15, Tp. 6, Rge. 20, w. 2 m., Sask.

25332, Sept. 1.—Authorizing C.P.R. to build spurs at Bradbury, Man., for Manitoba Steel Foundries.

25333, Aug. 30.—Ordering G.T.R. to appoint and maintain, at own expense, watchman at Ottawa Ave., South River Village, Ont., to be on duty between 9 a.m. and 9 p.m. daily.

25334, Aug. 31.—Relieving C.P.R. from providing further protection at highway west of Shoal Lake station, Man.

25335, Aug. 31.—Authorizing Saskatchewan Board of Highway Commissioners to build highway over C.N.R. on boundary line between north and south halves of Sec. 33-33-4, w.3.m.

25336, Aug. 30.—Approving plan, dated June 28, showing proposed alterations in interlocking plant at crossing of C.P.R. and Jacques Cartier Union Rlys. at Ballantyne, Montreal Terminals.

25337, Aug. 30.—Ordering C.P.R. to divert highway at Sagua, N.B.; 20 per cent. to be paid by railway grade crossing fund, \$500 by New Brunswick Government, and remainder by C.P.R. Westfield Parish to acquire necessary lands.

25338, Aug. 21.—Authorizing Toronto and Hamilton Highway Commission to build a highway crossing over G.T.R., in Burlington, Ont., and across the Hamilton Radial Ry. on Maple Ave.; and to divert highway along Water St., and across G.T.R., and Toronto and Niagara Power Co.'s lands.

25339, Aug. 28.—Ordering that Bronson Ave., Ottawa, Ont., be protected by gates, operated by day and night watchmen; 20 per cent. of cost to be paid out of railway grade crossing fund, and of remainder half by city and half by G.T.R.; operation and maintenance divided equally between city and G.T.R.; work to be completed by Dec. 1.

25340, Sept. 2.—Authorizing G.T.R. to build additional track across highway between Cons. 2 and 3, Tres St. Sacrement Parish, Que.

OCTOBER, 1916.]

25341. Sept. 2.—Relieving New York Central & Hudson River Rd. from maintaining watchmen at crossing of highway near Beauharnois station, Que.

25342. Sept. 5.—Ordering C.P.R. to appoint station agent at Fortune, Sask., during Sept. Oct., Nov., and Dec., each year, until otherwise ordered.

25343 to 25345. Sept. 1.—Approving Bell Telephone Co. agreements with Westport Rural Telephone Co., Aug. 16; Monck Tp., Ont., July 13, and Watt Tp., Ont., July 1.

25346. Sept. 7.—Authorizing G.T.R. to build siding for Canada Forge Co., Welland, Ont.

25347. Sept. 2.—Ordering C.P.R. to protect crossing of Main St., Farnham, Que., by gates, operated by day and night watchmen; 20 per cent. of cost to be paid out of railway grade crossing fund; work to be completed within 60 days.

25348. Sept. 1.—Approving agreement between Bell Telephone Co. and Leeds and Frontenac Rural Telephone Co., Aug. 14.

25349. Sept. 1.—Extending for three months from date, time within which C.P.R. shall complete spur and sidings for Dominion Sugar Co., Chatham, Ont.

25350. Sept. 8.—Ordering C.P.R. to build spur on east half of Sec. 23-2-7, w-2-m, mileage 148.9, Estevan Subdivision, Sask.

25351 to 25377. Sept. 7.—Authorizing Canadian Northern Ry. to build its Winnipeg Northern branch across certain highways, at rail level, in Manitoba.

25378. Sept. 7.—Authorizing Canadian Northern Ry. to build across highway between river lots 116 and 115, St. Clements Parish.

25379 to 25388. Sept. 8.—Authorizing Canadian Northern Ry. to build across certain highways in Manitoba.

25389.—Sept. 8.—Authorizing Lake Erie and Northern Ry. to build across Leonard St., Brantford, Ont.

25390. Sept. 8.—Authorizing Canadian Northern Ry. to build spur in s.e. 1/4 Sec. 7-28-19 w-4-m, Alberta, for Western Commercial Coal Co.

25391. Sept. 8.—Authorizing C.P.R. to build second track across road allowance between Secs. 8 and 9-17-23, w-1-m, Man.

25392. Sept. 8.—Authorizing Canadian Northern Alberta Ry. to build spur on n.w. 1/4 Sec. 36-52-22, w-5-m.

25393. Sept. 8.—Authorizing Great Northern Ry. to withdraw for present year mixed train service on its Oroville-Princeton subdivision, required by order 23663, May 4, 1915; withdrawal to take effect Sept. 18, 1916.

25394. Sept. 11.—Amending order 25305, re spur for Dominion Steel Foundry Co., Hamilton, Ont.

25395. Sept. 8.—Authorizing Canadian Northern Ry. to build across Church and Colville Roads, East Selkirk, Man.

25396. Sept. 8.—Authorizing Saskatchewan Government to build highway across Grand Trunk Pacific Branch Lines Co.'s right of way, at north end of Bechard station.

25397. Sept. 8.—Authorizing C.P.R. to build its Kerrobert Subdivision across road allowance between Secs. 16 and 17-30-15, w-3-m, Sask.

25398. Sept. 8.—Authorizing C.P.R. to build extension to Canada Lumber Co.'s siding, York Tp., Ont.

25399. Sept. 9.—Ordering G.T.R. within 60 days to install improved type automatic bell at Lake Road crossing, east of Grimsby, Ont., 20% of cost to be paid out of railway grade crossing fund.

25400. Sept. 11.—Approving C.P.R. plan, Aug. 12, as revised Aug. 21, showing transfer tracks at Government elevator, Moose Jaw, Sask., providing for interchange with G.T.P.R.

25401. Sept. 11.—Authorizing Sunny South rural municipality no. 123, Suffield, Alta., to build highway across C.P.R. between Secs. 14 and 15-16-10, w-4-m.

25402. Sept. 11.—Authorizing City of Toronto to use structure for passage of street cars, authorized to be built east of Strachan Ave. by order 25093, June 17.

25403. Sept. 11.—Ordering Canadian Northern Ry. to fence certain portions of its railway between Vita and Caliento, Man., by July 31, 1917.

25404. Sept. 11.—Amending order 23863, June 15, 1915, re protection of Central Vermont Ry. crossing at St. Armand, Que.

25405. Sept. 11.—Ordering Edmonton, Dunvegan & British Columbia Ry. to build station accommodation for passenger, baggage, express and l.c.l. freight; and siding accommodation for carload freight at Tomkins Crossing, Alta.; station to equal standard station, B.R.C. 1 B, with platform for at least 3 passenger cars; work to be completed by Oct. 31.

25406. Sept. 13.—Authorizing G.T.R. to build spur for Goodyear Tire & Rubber Co., Toronto.

25407. Sept. 13.—Authorizing G.T.R. to build siding and two spurs from north of Eighth St., New Toronto, southwesterly along Ninth St., to Birmingham St.

25408. Sept. 12.—Ordering Canadian Northern Ry. to build siding at mileage 18, Moose Jaw Subdivision, Sask.

25409. Sept. 12.—Authorizing Saskatchewan Highway Commissioners to build highway over C.P.R. spur in n.e. 1/4 Sec. 33-17-18, w. 2 m.

25410. Sept. 12.—Relieving G.T.R. from speed limitation of 10 miles an hour over Talbot Road crossing, Courtland, Ont.

25411. Sept. 12.—Approving plan showing under crossing of Esquimalt & Nanaimo Ry. by Shawinigan Lake Lumber Co.'s logging railway, British Columbia.

25412, 15413. Sept. 12.—Relieving G.T.R. from speed limitation of 10 miles an hour over crossings at Chatham Road, Thamesville, Ont., and near Allanburg station.

25414. July 14.—Ordering that 20% of cost of installing gates at Pembina highway crossing, Winnipeg, by Canadian Northern Ry., be paid out of railway grade crossing fund.

25415. Sept. 12.—Relieving Lake Erie & Northern Ry. from providing further protection at Cherry Valley road crossing, Townsend Ep., Ont., at mileage 38.25.

25416. Sept. 12.—Authorizing Grand Trunk Pacific Ry. to build spurs for Great West Coal Co. in s.e. 1/4 Sec. 7-53-23, w. 4 m., Alta.

25417. Sept. 15.—Extending, for six months from date time within which C.G.T. shall complete spur for International Harvester Co. of Canada, Ltd., Hamilton, Ont., as authorized by order 24801, March 14.

25418. Sept. 16.—Authorizing G.T.R. to build siding with four spurs for Goodyear Tire & Rubber Co., New Toronto, Ont.

25419. Sept. 14.—Ordering Canadian Northern Ry. to erect standard third class station at Palmer, Ont., by Aug. 1, 1917.

25420. Sept. 14.—Authorizing Travers Municipality Local Union no. 188, Alta., to build highway across C.P.R. near Travers station.

25421. Sept. 14.—Amending order 25270, Aug. 14, re two crossings of Grand Trunk Pacific Ry. by Alberta Government at Cooking Lake.

25422. Sept. 15.—Extending for three months from date time within which C.P.R. shall complete spur for Conger Lehigh Coal Co., Ltd., Toronto, authorized by order 25030, June 5, 1916.

25423. Sept. 14.—Ordering Kettle Valley Ry. to fence its track from mileage 22.5 to 30 on the Penticton to Princeton portion by Oct. 31.

25424. Sept. 16.—Ordering Canadian Northern Ry. to build transfer track at Yorkton, Sask., with Grand Trunk Pacific Branch Lines Co.; C.N.R. to pay 4/5 and G.T.P.B.L. Co. balance of cost; both companies to furnish, without charge, necessary land on their respective rights of way for transfer; maintenance to be borne equally and track to be completed by Oct. 31.

25425. Sept. 15.—Extending for three months from date time for construction of extension to Boake Mfg. Co.'s siding for Harry Webb Co., Toronto.

25426. Sept. 15.—Authorizing Vancouver, Victoria & Eastern Ry. & Navigation Co. (G.N.R.) to open for traffic its line from Kilgard to Sumas Landing, B.C., mileage 37 to 45.35.

25427. Sept. 15.—Ordering Canadian Northern Ry. to maintain present schedule of trains nos. 9 and 10 in operation between Deseronto and Toronto, pending enquiry by the Board.

Cafeteria for C.P.R. Employees.—For the convenience of employees, of whom there are nearly 2,000 in the Windsor St. Station building at Montreal, the C.P.R. has started a cafeteria luncheon at 15c in a large apartment which will accommodate 251 persons at a sitting. In the offices there are hundreds of girls, especially, who have not time to go home, or who, if they do go home, are greatly pressed for time. With this service at their disposal they will save car fare; will get a satisfying luncheon; and can have on wet or cold days the comfort of the lounge room in connection, which contains a piano, magazines and papers and in which they can rest for the balance of their lunch hour. The arrangement is four to a table. There is still the 30c luncheon upstairs, and the regular dining room with a la carte service; but the cafeteria is strictly for employees, male and female, who prefer to have lunch inside the building to going to restaurants or carrying it from their homes.

The Great Northern Ry. has set aside \$1,000,000 to endow a pension plan for veteran employees. The plan went into effect on Sept. 16, the anniversary of the late James J. Hill's birth. The appropriation will be invested in bonds, interest on which will be used for pensions, but if the fund thus created proves insufficient the deficit will be paid out of earnings and included in operating expenses. Employees are to be retired at 70, but may voluntarily retire at 65 and receive pensions. The system will take in employees who have been continuously in service for 20 years or more.

Railway Finance, Meetings, Etc.

Canadian Northern Railway.—There has been filed with the Secretary of State at Ottawa, a trust agreement dated Sept. 1, made between the Canadian Northern Ry., the Mount Royal Tunnel and Terminal Co., and others, to the Central Trust Co. of New York as trustees, securing an issue of one year 5% gold notes.

There has also been filed with the Secretary of State at Ottawa a mortgage executed by the C. N. R. securing \$15,000,000 repayable on demand, and also mortgages given by certain of the companies included in the C. N. R. system, securing loans made to them out of the \$15,000,000, the companies being as follows: Canadian Northern Alberta Ry., Canadian Northern Western Ry., Canadian Northern Ontario Ry., Canadian Northern Quebec Ry., Central Ontario Ry., Duluth, Winnipeg & Pacific Ry., Halifax & South Western Ry., Quebec & Lake St. John Ry., Qu'Appelle, Long Lake & Saskatchewan Rd. & Steamboat Co.; Mount Royal Tunnel & Terminal Co. Limited; Bay of Quinte Ry.

C.P.R. Note Certificates.—Hallgarten & Co., and Kean, Taylor & Co., New York, offered recently \$2,500,000 C.P.R. 6% note certificates at 101% and accrued interest, to yield about 5.73%. They are part of a total issue of \$52,000,000, all of which were sold by the company at the time of issue. The prospectus says:—"These notes are a direct obligation of the company, which enjoys an extremely high credit position. At present they constitute the company's only funded debt, with the exception of \$11,280,000 equipment notes maturing serially until 1928 and \$3,650,000 5% bonds of the Algoma Branch due in 1937. As security for these certificates the company agrees that the monies accruing from time to time from deferred payments on lands heretofore sold and interest thereon and from securities in which the proceeds of land sales have been invested shall be set aside for the purpose of paying principal and interest of these certificates. The amount of such deferred payments, securities, etc., aggregated \$56,268,768 on June 30, 1916."

Klondike Mines Ry.—The board of directors for the current year, elected at the annual meeting, recently, is as follows: H. B. McGiverin, President; J. P. Ebbs, Vice President; Andrew Haydon, Secretary; John Latta and C. G. Keke-wich.

Magnetawan River Ry. The annual meeting was held at Toronto, Sept. 13. The following constitute the board for the current year: E. J. Chamberlin, President; H. G. Kelley, Vice President; Frank Scott, Secretary-Treasurer; J. E. Dalrymple, R. S. Logan, J. A. Yates, and J. Sharpe.

Montreal and Province Line Ry.—This G.T.R. subsidiary company held its annual meeting in Montreal recently. The officers for the current year are: E. J. Chamberlin, Chairman; E. C. Smith, President; J. G. Smith, Vice President; Marcus Alexe, Secretary; W. H. Chaffee, Assistant Secretary and Treasurer; E. Deschenes, Auditor.

Temiscouata Ry. Gross earnings for June, \$24,535; operating expenses \$16,022; net earnings \$8,513, net earnings for 12 months ended June 30, \$40,761.

White Pass and Yukon Route.—Gross earnings from Jan. 1 to July 31, \$964,795, against \$789,821 for same period 1915.

Railway Development, Projected Lines, Surveys, Construction Betterments, Etc.

Alaska.—H. U. M. Higgins, a U. S. Government engineer connected with the building of the government railway from Anchorage to Fairbanks, Alaska, is reported to have said, in an interview: "While the Government is doing the more elaborate work, such as bridges, etc., the system is to let grading contracts for small sections of the line, to station men who are paid upon the engineers' reports. Thus the middleman is eliminated, and a small contractor gets the whole of his earnings without deductions. The system has been found to work very well, and gives general satisfaction. There is a great deal of heavy construction on the line owing to the physical conditions of the country, and it is estimated that four years will elapse before Fairbanks is reached. The difficulty of securing material so far remote from centres of population has become almost inconceivable, and only those who have been on the work can realize the problems which have been presented in assembling construction supplies. Eventually the transportation has to be taken out of the hands of the ordinary steamship lines plying to Alaska, and use made of the United States army transports."

Dominion Atlantic Ry.—We are officially advised that the new passenger station to be built at Middleton, N.S., is to be a frame building, 70 x 26½ ft. over all, of C.P.R. standard design. It will contain a general waiting room 18 x 25 ft., ladies' waiting room 16 x 25 ft., and baggage and express room 16 x 25 ft., with suitable lavatories and office accommodation. The freight shed is to be a C.P.R. standard wooden structure 60 x 30 ft. on concrete foundations. The contract has been let to J. H. Hicks & Sons, Bridgewater, N.S.

Dominion Government Railway to Hudson Bay.—We are officially advised that grading is progressing favorably on the last 40 miles to Port Nelson, Man., from mileage 285 to 425. Track laying has reached mileage 300, and it is expected it will reach Kettle Rapids, the second crossing of Nelson River, by Oct. 20. The track has received the first lift of ballast to mileage 280, and the telegraph line has been erected up to the same point. The putting in of the substructure for the bridge at Kettle Rapids will be started during October. The construction season now drawing to a close has been very wet and labor has been very scarce, both of which facts have impeded progress. J. W. Porter is Chief Engineer. The head office was removed from Winnipeg to Pas, Man., Sept. 1. (Sept., pg. 364.)

St. John and Quebec Ry.—There has been deposited with the Minister of Public Works at Ottawa, plan and description of the site of the proposed bridge across the Nerepis River, at Westfield, N.B., mileage 69.30, on the extension now under construction from Gagetown to Westfield. (Sept., pg. 364.)

Grand Trunk Pacific Ry.—We are officially advised that the grading for the extension of the line from St. Louis into Prince Albert, Sask., was completed some time ago. The work now to be done consists of track laying and ballasting, the building of stations and sidings, and the construction of terminal facilities at Prince Albert. These will include passenger station, freight house, locomotive house, loading platform, etc. The work is to start immediately and to be completed as fast as the labor market will

permit, which the company hopes will be this autumn. (Sept., pg. 364.)

Grand Trunk Ry.—We are officially advised that the work to be done in connection with the erection of the new car shops at Port Huron, Mich., involves the putting up of the following buildings:—Passenger car shops, composed of two buildings both 130 ft. wide x 250 and 310 ft. long, respectively, and both being served by a transfer table 60 ft. wide; 2 story cabinet shops 75 x 225 ft.; blacksmith shop 75 x 300 ft.; machine shop, 75 x 300 ft.; office building 42 x 88 ft.; store room 65 x 150 ft.; wood mill 100 x 200 ft.; lumber storage 75 x 130 ft.; dry kiln, 40 x 80 ft.; freight car shop 160 x 350 ft.; paint shop 25 x 50 ft. The buildings will be constructed principally of brick and concrete. The power plant is to be of modern construction equipped with boilers and generating plant for furnishing electric power. The machinery will be motor driven throughout and the plant will be modern in every respect. The approximate expenditure is \$700,000. (Sept., pg. 364.)

Great Northern Ry.—The City of Vancouver has issued a permit to the company to build a freight shed on the company's property at False Creek. The building is to be erected in close proximity to the new passenger station which is now well advanced, and is to be 600 x 50 ft. The estimated cost is \$25,000. The contractors are Grant, Smith and MacDonald.

The Board of Railway Commissioners has ordered the building of a permanent steel bridge across the North Road in Burnaby municipality, B.C., within a year. The bridge is to have a 24 ft. roadway with a 6 ft. sidewalk on either side. (Sept., pg. 364.)

Intercolonial Ry.—The Railways Department has declined to accept any of the tenders submitted for the erection of the station buildings in connection with the new ocean terminals under construction at Halifax, N.S. The reason given is that all the tenders were too high to justify the placing of a contract, but the tenderers justify their figures by the present high price of materials and the scarcity of labor. Other tenders for the work have not yet been invited.

In an address to the Rotarian Club of St. John, N.B., Aug. 31, Jas. MacGregor, who has resigned his position as Superintending Engineer, in order to go overseas with the Canadian Expeditionary Forces, spoke of the work being done and that while Halifax is pre-eminently the Canadian port on the Atlantic seaboard, there is ample trade for St. John as well. In carrying out the work Mr. MacGregor said the following quantities of material were required to be handled: Gravel and sand, 250,000 cubic yards; cement, 350,000 barrels; steel, 10,000 tons; granite, 2,000,000 cubic ft.; lumber, 5,000,000 ft. b.m.

F. P. Gutelius, General Manager, is reported to have said, Sept. 1, that with the close of navigation on the St. Lawrence River this season three additional berths would be ready at the Halifax ocean terminals, and three temporary sheds would be available.

F. P. Gutelius, General Manager, spent Sept. 1 in Halifax, and had a conference with the Mayor and the City Engineer in respect to a number of matters connected with the development of the port. The following statement was subsequent-

ly made by Mr. Gutelius: "We have settled with the Mayor and City Engineer all outstanding in connection with the closing of streets and exchange of property for the Halifax Ocean Terminals, and they anticipate that the tentative settlement will be approved by the Board of Control and the City Council at their next meeting, when the details of the entire transaction will be published. The settlement includes the dedication of the Flynn estate at the North West Arm for a hospital site and further than that the beaches on the Anderson estate and the Flynn estate will be dedicated to the public for recreation grounds, as the city may determine. With reference to the subway at the Three Mile House, at the solicitation of the Mayor and City Engineer the plans have been modified so as to improve the view of the subway on all approaches, and we are satisfied that when the work, as agreed on, is completed, the objections from automobile owners will be fully met. It is to be pointed out, however, that the speed of automobiles must always be limited when approaching subways located at a junction of highways."

The Railways Department has under consideration tenders for the construction of the foundations for a 500,000 bush. storage grain elevator, working house and track shed at St. John, N.B. (Sept., pg. 364.)

Kootenay and Alberta Ry.—The charter and assets of this projected railway were purchased by D. Redman, on behalf of the North American Collieries Co., on Sept. 7, for \$250,000. The amount of the reserve bid fixed by the court. The sale was made as a result of a foreclosure action against the company by the Alliance Investment Trust Co.

The K. & A. R. was incorporated by the Dominion Parliament in 1909, to build a railway from the C. P. R. Crownsnest Branch between Cowley and Pincher, Alta., through the Beaver Valley and the North Kootenay Pass to the International boundary in B.C., and through Pincher Creek and the Blood Indian Reserve, and the Milk River Valley to the International boundary near Coutts, Alta.

The charter was owned by interests associated with the Western Coal and Coke Co., Montreal, of which C. Fergie was manager. The coal company built a line of 13 miles from Pine Tree Harbor on the C.P.R. Crownsnest Pass Branch to the coal mine at Beaver Creek, Alta., in 1912, (Oct., 1912, pg. 501.)

The Maritime Ry. Power and Coal Co. proposes to open a new colliery near Maccan, N.S., and it is reported will build some additional lines and sidings in connection therewith. (Sept. 1910, pg. 727.)

The Nova Scotia Coal, Iron and Ry. Co.'s certificate of registration has been revoked by the Nova Scotia Government, the company having failed to pay registration fees due. The company was originally chartered to develop coal areas in the Broughton coal field, and a railway in connection therewith.

Pacific Great Eastern Ry.—Some work is being done on the extension of the line from Clinton to Prince George, B.C., for which funds were provided in a \$2,000,000 loan arranged by the British Columbia Government in London, Eng., at the end of July. Until this section of the line is completed nothing will be done in connection with the projected extension from Prince George to the B.C.-Alberta

boundary in the Peace River district where it is proposed to make connection with the Edmonton, Dunvegan & British Columbia Ry. (Sept., pg. 364.)

Pere Marquette Rd.—J. J. Corcoran, Superintendent Detroit-Canadian Division, and other officials were in Sarnia, Ont., Sept. 8, in conference with the Board of Trade respecting the building of a new station. The present station is inconveniently situated, particularly for passenger traffic, and is altogether inadequate for the traffic. It is suggested that the property at the end of the Christina St. pavement can be secured at a reasonable price. The Superintendent stated that it was proposed to build a modern station at an early date (Feb., pg. 49.)

Prince Albert District.—The Price Al-

bert, Sask., Board of Trade is getting a petition signed by farmers asking the Dominion and Provincial Governments to take steps to have a colonization railway built to open up the agricultural lands to the north of that place.

Vancouver Terminal Ry.—In connection with the proposals for the development of Vancouver, B.C., harbor, the Harbor Commissioners propose to build a terminal railway along False Creek, and have made application to the City Council for a right of way. At a conference of the representatives of Pacific Port authorities held at Vancouver, Sept. 5, a resolution was passed approving of the proposal for laying out a terminal railway there as a public work. (July, pg. 282.)

Freight and Passenger Traffic Notes.

The Lehigh Valley Rd.'s new passenger station in Buffalo, N.Y., was opened for traffic Aug. 29.

The C.P.R. has added to its Ontario Division the Camp Borden Subdivision, extending from Ypres, the point of connection with the Toronto-Sudbury line, to the camp, and including its lines at the camp, 4.5 miles.

The harvest excursions are estimated to have taken about 30,000 men into the prairie provinces; the C.P.R. carrying 18,000; the Canadian Northern Ry. 7,000; and the Grand Trunk Pacific Ry. 5,000.

The Canadian Northern Ry. put in operation on Sept. 11 a new direct train between Brandon, Man., and Moose Jaw, Sask. It leaves Brandon Mondays, Wednesdays and Fridays, returning Tuesdays, Thursdays and Saturdays.

The G.T.R. lake route special trains made their last trips for the season of 1916 as follows: Toronto to Sarnia Wharf, and Winnipeg to Fort William, Sept. 16; Sarnia Wharf to Toronto and Sarnia Wharf to Detroit, Sept. 17; Fort William to Winnipeg, Sept. 18.

A new mail and express train was put in operation, Sept. 4, by the G.T.R. between Toronto and Collingwood, reaching the latter place at 10.30 a.m. Under the service previously operated the mail was not received in Collingwood until mid-day.

The G.T.R. advertising department is having a number of moving picture films made of beauty spots on its line from Toronto, and over the G. T. Pacific Ry. to Prince Rupert. Arrangements are reported to have been made for exhibiting them in the United States to promote tourist traffic to Canada.

The G. T. Pacific Ry. on Sept. 4 put on a tri-weekly train service on its Cutknife Branch, which extends from Battleford to the boundary between Saskatchewan and Alberta, replacing the weekly service heretofore given. This gives a through tri-weekly service from Biggar, on the main line, to Battleford and Carruthers.

An association of transportation men on the Pacific Coast, covering Washington, U.S., and British Columbia, is being formed to effectively advertise the area for tourist purposes. A preliminary meeting was held at Seattle, Wash., Sept. 7, and a general meeting for organization purposes has been called to be held at Tacoma, Wash., Oct. 11.

The Canadian Northern Ry. is reported to have completed a survey of the pulpwood and other resources along its line

between Ottawa and Port Arthur, Ont. The survey estimates that there are over 8,000,000 cords of pulpwood, and 25,000,000 ties available mainly on the land within the area from which it can select the land grant given by the Province of Ontario in aid of the building of the line.

The G.T.R., commencing Sept. 24, rearranged its train leaving Montreal and connecting with the Delaware and Hudson Co.'s lines at Rouses Point, for points in New York State. The following is now the time of the trains leaving Montreal on this route: Daily for New York, 9 a.m. and 8.20 p.m.; while the times of arrival will be: 8.25 a.m. and 8.25 p.m. daily. All other trains running between Montreal and New York are cancelled.

The clauses in the U. S. emergency revenue bill to prohibit admission of Pacific Ocean halibut or salmon through a foreign country except in bond from a U. S. port were abandoned by Congress, Sept. 7. These clauses were aimed at the extraordinary development of the shipments of halibut, etc., from Prince Rupert, B.C., since the opening of the Grand Trunk Pacific Ry., and the consequent lessening of the halibut fishery trade into Seattle, Wash.

The Hamilton City Council is applying to the Board of Railway Commissioners for an order to compel the G.T.R. to provide an adequate train service between Hamilton and Burlington Beach. It was reported to the council that there was an agreement between the company and the city as to the number of trains to be run, and that no evidence could be found of an agreement between the G.T.R. and the Hamilton Radial Ry., by which the electric railway had the exclusive right to the passenger traffic between the city and the Beach.

The Grand Trunk Pacific Ry. announces that on all tickets reading between Portage la Prairie, Man., or points east thereof, and Edmonton, Alta., or points west thereof, a free side trip will be given from Melville, Sask., to Moose Jaw, Sask., and return. Passengers availing themselves of free side trip to Moose Jaw will not be permitted the privilege of free side trip to Yorkton or Canora. Similarly passengers availing themselves of free side trip to Yorkton or Canora will not be permitted the privilege of free side trip to Moose Jaw.

The G.T.R. has made radical changes in the dress and arrangement of schedules in its time table folders, the first series of the new folders being issued Sept. 10. The folder that has been re-

arranged to the greatest extent is that heretofore known as the Complete Timetables, which is now designated Form A. This contains the complete timetables of the system, with the exception of the suburban train service at Montreal and Chicago, and the motor car service over the International Bridge between Bridgeburg, Ont., and Black Rock, N.Y. The folder also contains a complete list of all stations on the system, and condensed timetables of the G. T. Pacific Ry., the G. T. Pacific steamship lines, and of the Central Vermont Ry. The other folders are as follows:—Form B, Ontario Lines; Form C, Eastern Lines; Form D, Montreal Suburban Lines; Form E (former Form A), Lines west of Detroit and St. Clair River; Form F, Chicago Suburban Lines; Form G, pocket time card, Buffalo Port Colborne and Dunnville; Form H, pocket time card, motor traffic International Bridge between Bridgeburg and Black Rock; Form J, Chicago condensed through time table; Form K, Highlands of Ontario.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, compared with those of 1915-16, from July 1, 1916:

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$3,834,200	\$2,636,800	\$1,197,400	\$ 711,000
Aug.	3,684,900	2,612,900	1,072,000	614,300
	\$7,519,100	\$5,249,700	\$2,269,400	\$1,325,300
Incr	\$3,573,800	\$2,248,500	\$1,325,300	

Approximate earnings for three weeks ended Sept. 21, \$2,102,900 against \$1,702,100 for same period, 1915.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1915-16, from July 1, 1916:

	Gross Earnings	Expenses	Net Earnings
July	\$12,247,440.39	\$8,230,348.66	\$4,017,091.73
	\$12,247,440.39	\$8,230,348.66	\$4,017,091.73
Incr.	\$ 4,352,064.92	\$3,135,376.31	\$1,216,688.61

Approximate earnings for August, \$12,880,000 against \$8,414,000 for Aug. 1915, and for two weeks ended Sept. 14, \$5,407,000 against \$4,216,000 for same period 1915.

Grand Trunk Railway Earnings.

Following are the earnings and expenses for the G.T.R., including the Canada Atlantic Ry., the G.T.W.R. and D.G.H. and M.R., for July, compared with those for July, 1915:—

Grand Trunk Railway.			
Gross earnings	.....	\$1,170,000	
Expenses	.....	2,920,800	
Net earnings	.....	\$1,276,200	
Grand Trunk Western Railway.			
Gross earnings	.....	\$ 831,250	
Expenses	.....	
Net earnings	.....	\$ 240,500	
Detroit, Grand Haven and Milwaukee Ry.			
Gross earnings	.....	\$ 289,100	
Expenses	.....	
Net earnings	.....	\$ 54,300	
Traffic Receipts of the System.			
Aggregate from Jan. 1 to Aug. 31:—			
	1916	1915	
G. T. R.	.....	.....
G. T. W. R.	6,269,093	4,788,364	1,480,729
D.G.H. & M.R.	2,210,795	1,720,902	489,893
Total	.....	.....

Approximate earnings for August, \$5,750,376 against \$4,880,000 for Aug. 1915, and for two weeks ended Sept. 21, \$3,840,360 against \$3,188,108 for same period 1915.

Traffic Orders by Board of Railway Commissioners.

Distributing Tariffs from Manitoba Points.

25230. Aug. 1. Re application of Canadian Pacific, Canadian Northern and Grand Trunk Pacific Railway Companies for leave to revise the distributing or "town" tariff rates from Winnipeg, Portage la Prairie, and Brandon, Man., so as to conform to the basis laid down in the Board's judgment, dated April 6, 1914, as applicable from distributing centres in Saskatchewan and Alberta: Upon hearing the application at Winnipeg, June 12 and July 14, 1916, in the presence of counsel for and representatives of the applicant railway companies, the Winnipeg Board of Trade being represented at the hearing, no objection to the granting of the application being offered, and upon the recommendation of the Chief Traffic Officer of the Board, it is ordered that the application be granted.

Transfer Track at Basque.

25245. Aug. 3. Re application of the Canadian Northern Ry. for authority to construct a transfer track with the C.P.R. at Basque, B.C. It is ordered that the application be granted.

Brick Rates from Grand Piles.

25249. Aug. 3. Re complaint of Doucet & Freres, Grand Piles, Que., against freight rates on brick from Grand Piles to Yamachiche, and other points in the Province of Quebec, over the C.P.R. It is declared that the joint rate on brick from Grand Piles to Shawinigan Falls and Grand Mere, Que., on the Canadian Pacific and Canadian Northern Railways, should be $3\frac{1}{2}$ c; and it is ordered that the said railway companies be authorized to refund to the applicants $\frac{1}{2}$ c per 100 lb. on any shipments of brick to Shawinigan Falls and Grand Mere for which a charge of 4c has been made; and that the complaint with respect to rates to other points in the Province of Quebec be dismissed.

Heated Refrigerator Car Service.

25251. Aug. 5. Re the consideration of the question of extra charges proposed by carriers for heated refrigerator car service from points in Eastern Canada to points west of Fort William, Ont. Upon hearing the matter at Winnipeg, June 12, Saskatoon, June 14, Edmonton, June 15, Calgary, July 10, and Winnipeg, July 14, 1916, the Winnipeg and Saskatoon Boards of Trade, the Calgary Brewing Co., the Canadian Manufacturers' Association, the Prairie Provinces Branch of the Canadian Manufacturers' Association and the Canadian Pacific, Canadian Northern, and Grand Trunk Pacific Railway Companies being represented; and upon the report of the Chief Traffic Officer of the Board: It is ordered that order 24994, May 22, 1916, suspending certain tariffs showing charges for the use of heated refrigerator cars, in so far as it affects the following railway tariffs, namely, Canadian Pacific C.R.C. 2156; Esquimalt & Nanaimo C.R.C. 327; Kettle Valley C.R.C. 83; Grand Trunk Pacific C.R.C. 158; Canadian Northern C.R.C. W-936, be rescinded; provided that sec. 3 of said tariffs shall apply only when loading is done by shippers, and that sec. 4 be eliminated.

Crushed Stone Rates from Hagersville.

25255. Aug. 11. Re application of the Hagersville Contracting Co., Ltd., and Hagersville Crushed Stone Co., against the proposed increase in freight rates on crushed stone from Hagersville to Windsor and Pelton, Ont., from 65c a ton to

85c a ton, as shown in Supplement 12 to Michigan Central Rd. Tariff C.R.C. 2490. It is ordered that the said increased rates on crushed stone be disallowed pending further order.

Grain and Lumber Stopped for Orders.

25285. Aug. 18. Re complaint of Montreal Board of Trade against track storage charge made by C.P.R. on lumber and forest products at Cartier, Ont., and against the same charge made by the G.T.R. at Sarnia, Ont. It is ordered that the G.T.R. be authorized to charge the following special tolls for detention of cars containing lumber and forest products at Sarnia, for more than 72 hours, while awaiting furtherance orders from the consignee thereof, viz., \$1 a car per day of 24 hours, or part thereof, for the first 2 days following the expiration of the 72 hours, and \$2 a car per day of 24 hours for each succeeding day or part thereof; the said tolls to be chargeable in addition to the ordinary demurrage toll, prescribed by General Order 1 (formerly order 906), Jan. 25, 1906, and the stop-over charge as fixed by order 6148, Jan. 21, 1909, as amended by order 10418, April 26, 1910; and it is further ordered that order 24436, Nov. 11, 1915, be amended so as to include lumber and forest products detained at Cartier, for orders.

Cleaning and Disinfecting Live Stock Cars.

25313. Aug. 17. Re complaint of Henry Miles of Point Fortune, against the unloading charge of \$1 a car at Hochelaga stock yards, and the charge of 75c a car for cleaning and disinfecting live stock cars, as assessed by the C.P.R.. Upon hearing the complaint at Montreal, June 28, 1916, in the presence of counsel for the C.P.R., no one appearing for the complainant, and upon the report of an inspector of the Board, it is order that the complaint be dismissed.

The Assistant Chief Commissioner, D'Arcy Scott, gave the following judgment: It is provided in the Live Stock Contract approved by the Board that stock shall be loaded and unloaded by the owner. In the present case the car was shipped to the East End stock yards, Montreal, where, owing to the nature of the yards and the volume of traffic handled it is impracticable for cattle to be unloaded by the owner. Consequently, the railway company has provided in Supplement 6 to C.R.C. no. E. 3041, a charge of \$1 car for unloading or loading cattle at the East End cattle market, Montreal. From the explanation given by the company at the hearing, it appears to me that it is justified in making this charge and I do not think the tariff should be interfered with. As far as the 75c for cleaning and disinfecting a car is concerned, that item is covered by the same supplement and was some time ago considered and approved by the Board.

Potatoes and Turnips from Maritime Provinces.

25322. Aug. 30. The application of Jones & Jones, of Woodstock, N.B., respecting shippers of potatoes in the Maritime Provinces for suspension of C.P.R. Tariff C.R.C. no. E-3176, and the Temiscouata Ry. Tariff C.R.C. no. 256, applying on potatoes and turnips from points in the Maritime Provinces to stations in Ontario and Quebec: Upon reading what has been filed on behalf of the applicants, it is ordered that the said tariffs be suspended, until further ordered.

C.P.R. Standard Mileage Freight Tariff.

25327. Aug. 20. Re application of C.P.R., under sec. 327 of the Railway Act, for approval of Supplement 1 to its Standard Mileage Freight Tariff, C.R.C. no. W-1948: Upon the recommendation of the Chief Traffic Officer of the Board, it is ordered that the said supplement be approved.

Export Rates on Iron and Steel.

25453. Sept. 22. Re application of Canadian Manufacturers' Association for suspension of proposed cancellation of rates on iron and steel articles from stations in Canada to Montreal, Quebec and the Atlantic seaports for export. Upon reading what has been submitted on behalf of the applicants, it is ordered that the proposed cancellation of special commodity rates on iron and steel articles from stations in Canada to St. Lawrence River and Atlantic ports for export, as contained in the following schedules, be suspended pending hearing on a date to be fixed by the Board. Grand Trunk Ry. Supplement 8 to tariff C.R.C. no. E-3351; supplement 34 to tariff C.R.C. no. E-3088; supplement 38 to tariff C.R.C. no. E-3089. Canadian Pacific Ry.—Supplement 25 to tariff C.R.C. no. E-2944; supplement 27 to tariff C.R.C. no. E-2946; supplement 10 to tariff C.R.C. no. E-3131. Toronto, Hamilton & Buffalo Ry.—Supplement 5 to tariff C.R.C. no. 1047; supplement 2 to tariff C.R.C. no. 1086; supplement 2 to tariff C.R.C. no. 1046; supplement 3 to tariff C.R.C. no. 1090. Canadian Northern Ry.—Supplement 10 to tariff C.R.C. no. E-624. Michigan Central Rd.—Supplement 3 to tariff C.R.C. no. 2521. Wabash Ry.—Supplement 4 to tariff C.R.C. no. 933. Pere Marquette Rd.—Supplement 4 to tariff C.R.C. no. 2007.

Endorsement Re Seed Grain Advances.

General Order 170. Aug. 5. Re general order 148, Sept. 1, 1915, authorizing companies within the legislative control of the Parliament of Canada and operating in Alberta and Saskatchewan, to endorse upon the bills of lading, approved under order no. 7562, July 15, 1909, the amount of advances for seed grain, fodder for animals and other goods furnished to persons in the said Provinces, and the interest agreed to be paid, authorized by chap. 20 of the acts, 1915, and as provided under order in council of July 23, 1915: Upon the report of the Governor in Council by Order in Council dated July 31, 1916, terminating on Sept. 1, 1916, the arrangement whereby the railway companies endorse indebtedness on bills of lading, it is ordered that the General Order 148, dated Sept. 1, 1915, be rescinded on and after Sept. 1, 1916.

I. R. C. Moncton Offices.—The Division Superintendent of the Intercolonial Ry. at Moncton, N.B., has removed his offices from the station building to the Rest House, and the Superintendent of Car Service has moved his offices from the station building to the Creighan Building, Main St. It has not been announced what will be done with the vacant offices at the station.

Railway Taxation in Montreal.—The City Recorder has fixed the valuation for taxation purposes of the C.P.R., the G.T.R., and the Canadian Northern Ry. tracks within the city at \$5,000 a mile. Then Board of Assessors put a valuation of \$6,000 a mile on the line in 1912, and the matter has been before the courts since.

Canadian Pacific Ry. Construction, Betterments, Etc.

The Montreal City Council has given notice that the bridge at Notre Dame St., which collapsed a short time ago when some freight trains collided must be replaced by a permanent structure of concrete and steel. The company claims that the bridge which was destroyed was of a permanent character, and can be rebuilt as it was before.

A Kingston, Ont., press report says C.P.R. officials are investigating the possibility of electrifying the company's line from Kingston to Renfrew, the power to be obtained from the Mississippi River. This is the old Kingston and Pembroke Ry., 103.4 miles.

The Manitoba Bridge and Iron Works started work, Sept. 5, on the erection of the platform roofs at Winnipeg. They will be of the umbrella type. The work is expected to be completed early in the autumn.

S. P. Dunham, President of the United Farmers of Alberta, was advised recently by Grant Hall, Vice President, and General Manager, Western Lines, that there were districts in the country wanting railway accommodation worse than the

to the harbor line, a distance of 812 ft. It will approximate 170 ft. in width, including a central portion of 140 ft. with a 15 ft. open space on either side. The Vancouver Province, referring to the work, says: "The gravel fill taken in the dredging operations between sheds 3 and 7 will be deposited in the centre and will come up to low water. Through this gravel fill there will be driven piles or concrete caissons down to hard bottom. The structure will be a 2 story one and all the latest contrivances will be used for the loading and unloading of vessels. The docks in the centre will be so arranged as to be capable of being depressed or lifted according to the state of the tide. There will be a bridge from Burrard viaduct on to the structure and to the second floor. The lower floor will be kept as free from teaming as possible and the upper floor will be used for local cargo. Elevators will be installed to work between the upper and lower floors. The upper floor will likely be constructed of solid construction steel. At low tide there will be 35 ft. of water at the outer edge of the pier and this will, it is be-

What Efficiency Testing Really Means.

By R. W. D. Harris, Trainmaster, C.P.R., Ignace, Ont.

In the mind of the progressive railway man efficiency is synonymous with safety, and the employee who looks at efficiency tests in their true light, welcomes them as a means of proving his worth, of showing him wherein lies his weakness or his strength. Efficiency tests are absolutely necessary, not only to ensure the proper performance of duty, but, as is primarily their mission, to check and safeguard the employee against his own possible mistakes, the greatest of which I can safely say is, "taking chances." Not a few of us know by experience how the mere fact that our work may become mechanical, the same day after day, makes a loophole for laxity to creep in, and then, indeed, are we in danger. No one can develop without the right test made in the right way and by the right person. By our failures we can attain to greater efficiency than by the way of untested efforts. Personally I have found the men, as a rule, ready and glad to take suggestions and instruction how to improve their work when failure has been the result of a test. They are beginning to see that it is not failure, but efficiency, that the officer is looking for, and that greater vigilance should be uppermost in their minds. Guided by an alert, clear brain, the hand is steadier, the eye keener, the ear quicker, and with pride in his work and the knowledge that his best is expected, ambition to excel is stimulated in the interested employee. I have noticed that occasionally an employee, notably a locomotive man, who is apparently all that can be desired in his particular line, becomes completely rattled when the unexpected happens, and in railway parlance "falls down," and too often for the reason that he has never been subjected to critical supervision and discriminating discipline. Such a man should be taken in hand and if possible educated, otherwise he may become one of those misfits in whose wake calamity follows sooner or later.

The sentiment in regard to surprise tests is changing, and the majority of the men are not only willing but anxious for the officer to see that they are on their job all the time. If tests could be the work of a special officer who would daily and hourly devote himself conscientiously and systematically to it there would not be the danger of continually repeating a test on the same employee, as sometimes happens through no fault of the one making the test, thereby engendering in the employee a feeling that the officer is hounding him and looking for failure. Such occurrences are unavoidable at times, for a test, to be genuine, must be unknown to the man who is tested and information sought as to his identity sometimes renders a test futile.

Efficiency testing should not be regarded as the work of a spotter, or spy, as I have frequently heard it stigmatized, but the judicious skilful work of a special officer through whom each and every employee shall receive sometimes much needed educating. What would be punishment to one man would not affect another in the same degree; all natures are not alike and a hard and fast rule for discipline is difficult to apply and attain the desired result. But if the men can be made to understand that the officers mean to put into practical application the golden rule, that right and justice are the paramount objects in discipline, then I believe that



Union Station, Quebec, built by Canadian Pacific Railway.

Canadian Railway and Marine World for September contained a description of the above mentioned new station, with an illustration made from the architect's drawing. The accompanying illustration is made from a photograph and shows the building as completed. As previously stated, it will also be used by the Canadian Government Railways for National Transcontinental Ry. train service.

district northeasterly of Kipp, Alta. The United Farmers asked for the immediate building of a line from Kipp, northeasterly for 25 miles. The route plans for this line were approved by the Minister of Railways, April 16, 1913, but nothing in the way of construction has been done. The organization proposes to appeal to the Dominion Government to see what can be done to have the line built.

Work on the completion of the Rogers Pass cut-off—which includes the tunnel, the name of which we are officially advised is to be the Connaught Tunnel—is being rapidly completed. The approach lines are practically finished, and the ventilating machinery is being installed. The tunnel, which is said to be 5 miles 5 ft. long, is expected to be opened for traffic early in November.

Tenders were received to Sept. 25 for building a jetty pier, in connection with the company's deep water terminals on Burrard Inlet, Vancouver, B.C. A description and plan of the site of the proposed jetty, has been deposited with the Department of Public Works, Ottawa. The pier is to be built between the present piers A and D, and will be known as Pier B. Like pier A it will go right out

lied, be sufficient to accommodate any size of vessel that may call at this port for many years to come." (Sept., pg. 361.)

Duty on Steel Rails.—Recent press reports from Ottawa have stated that on representations that Canadian railways could not secure steel rails in Canada, the mills being largely engaged in producing war material, the Government would probably suspend or reduce the customs duty on steel rails temporarily. An Ottawa press dispatch of Sept. 23 said the following announcement had been made officially: "It is understood that an arrangement has been made with regard to supplying rails required by the railway companies which will satisfy temporarily the urgent requirements of the various railway systems."

Canadian Northern Ry. Fishing Lodge.—The C.N.R. had in operation from about June 15 to Sept. 15, a fishing lodge which it built on the shore of Orient Bay, an arm of Lake Nipigon, Ont., with accommodation for about 20 guests. It was operated as an annex of the company's hotel at Port Arthur, Ont.

the majority of the employees will loyally co-operate in similar spirit and the business of the road be conducted on the plane of mutual helpfulness. It takes a friend to tell us our faults, and the efficiency officer should be able to so conduct his work that he will elevate his office and be regarded as the employees' friend in deed. Under such conditions efficiency tests will be the means of leading up to just what a railway stands for in practice as well as in theory—safety to the travelling public and to the employee, efficiency in its highest and best sense.

Railway Rolling Stock Notes.

The Canadian Northern Ry. has received 3 tourist cars, nos. 9408, 9411 and 9413 from Canadian Car and Foundry Co.

The National Steel Car Co., Hamilton, Ont., is reported to be making excellent progress with its order for freight cars for the French Government.

The 12 all-steel sleeping cars, which have been built recently, or are now being built for Canadian Government Railways, are to be named Levis, L'Islet, Louisburg, Lunenburg, Val Brilliant, Vancartier, Valley, Valois, Vernon, Ville Marie, Villeroi and Vivian.

Canadian Government Railways, between Aug. 16 and Sept. 18, received the following additions to rolling stock: 2 steel sleeping cars, from National Steel Car Co.; 13 vans from its Moncton shops, and 7 Pacific type locomotives from the Canadian Locomotive Co.

The Eastern Car Co. is reported to be negotiating for a contract for 4,000 cars for a foreign government, probably the Belgian. The first contract of 1,000 cars for the French State Railways has been completed, and it is expected that deliveries will commence in October of the remaining 3,000 cars on order for France.

Canadian Government Railways have ordered 20 all steel snow ploughs, for delivery by Dec. 1; 200 wooden box cars with steel draft arms, 30 tons capacity for delivery by Jan. 15, 1917, and 100 refrigerator cars with steel draft arms, 40 tons capacity, for delivery by Feb. 1, 1917, from Canadian Car and Foundry Co., and one 100 ton working crane from F. H. Hopkins & Co.

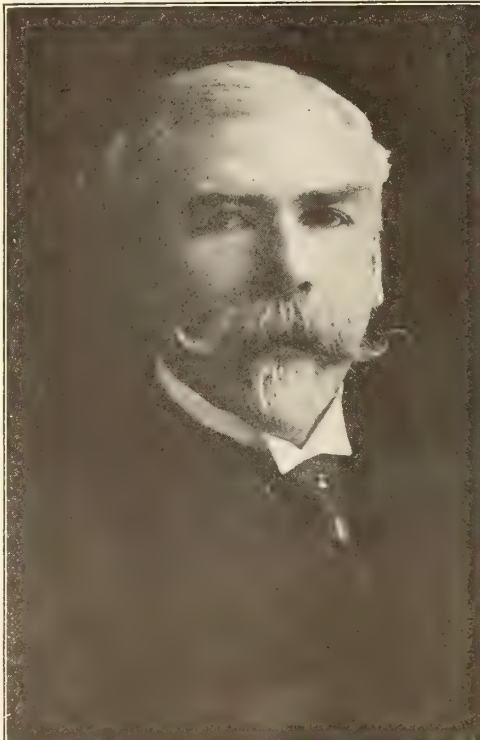
Following are some of the chief details of the 500 steel frame box cars which Canadian Government Railways have on order with Canadian Car and Foundry Co., as mentioned in a previous issue:

Length over striking plates 42 ft. 8½ in.
Length centre to centre of bolsters 31 ft.
Truck wheel base 5 ft. 6 ins.
Height from rail to top of running board 4 ft. ¼ in.
Length inside 40 ft. 6 ins.
Height inside 8 ft. 7 15/16 ins.
Door opening, width 6 ft.
Width over side sills 9 ft. 3 ins.
Width over all 9 ft. 9 ins.
Width over corner posts 9 ft. 9¾ ins.

The Eastern Car Co. has completed the first contract for 1,000 cars for the French Government, all of which have been delivered, and it expects to begin delivery in October on the second order from the French Government for 3,000 cars. Work is also beginning on 500 freight cars for the Canadian Government Railways. The company is negotiating for a contract to build 4,000 cars for another foreign Government, and if it is successful in securing this the works will be assured of orders to keep them employed for nine months of next year. Orders on hand are sufficient to keep the company busy throughout this year.

The Late Thomas J. Kennedy.

Thomas John Kennedy, one of the receivers and General Manager of the Algoma Central and Hudson Bay Ry., President and General Manager Algoma Eastern Ry., and Vice President and General Manager Trans-St. Marys Traction Co., died at Sault Ste. Marie, Ont., Aug. 29, of pernicious anaemia, after an illness lasting over three months. A funeral service, at which Archbishop Thorne officiated, was held at St. Luke's Cathedral, Sault Ste. Marie, of which he was one of the wardens for several years. During the holding of the funeral service, the operation of all trains and work on the A. C. & H. B. R. and Algoma Eastern Ry., and the system generally, was suspended for three minutes. The body was taken on his official car to his birthplace at Campbellford, Ont., where another service was held at The Home-stead, after which the burial took place



The late Thomas J. Kennedy.

in Christ Church cemetery. He leaves a widow and one daughter.

He was born at Campbellford, Ont., in 1854, and entered railway service in 1874 as chainman on the first C.P.R. survey east of Winnipeg, since when he was, consecutively, June 1877, assistant engineer on contract 15, C.P.R.; May 1880, engineer for Manning, Macdonald & Co., contractors for section B, C.P.R., at Rat Portage, Ont.; Oct. 1882 to the spring of 1885, Superintendent of Construction on the same section; June 1885, Roadmaster, White River section, C.P.R.; Aug. 1892, Superintendent, Chapeau District, C.P.R.; Sept. 1899, Superintendent, North Bay district, C.P.R.; June 1900 to Feb. 1911, General Superintendent, Algoma Central and Hudson Bay Ry., and Manitoulin and North Shore Ry., and from 1904 to Sept. 1910 also Manager, International Transit Co., Trans-St. Marys Traction Co., and the ferry line between Sault Ste. Marie, Ont., and Sault Ste. Marie, Mich.; Feb. 1911 to Oct. 1914, President, Superior Construction Co., Espanola, Ont., with contracts for the con-

struction of a section of the Manitoulin and North Shore Ry., now Algoma Eastern Ry., from Crean Hill to Whitefish; and subsequently for the northern section of the Algoma Central and Hudson Bay Ry. from Frank to Hearst. On a reorganization of several of the Lake Superior Corporation's subsidiary companies in 1914, he became, in October of that year, President and General Manager Algoma Central and Hudson Bay Ry., and Algoma Eastern Ry., and Vice President and General Manager, International Transit Co. and Trans-St. Marys Traction Co. in charge of street railways and ferries. Toward the end of 1914 he visited England and conferred with bondholders and others financially interested in the A. C. & H. B. R., and in March, 1915, he was appointed one of the two joint receivers on behalf of the bondholders. From the outbreak of the war, he took a very active interest in local committee appointed for that purpose.

C.P.R. Directors' Inspection Trip.

Lord Shaughnessy, President, C.P.R., left Montreal by special train on Sept. 9, accompanied by three directors, Sir Herbert Holt, R. B. Angus and E. W. Beatty, K.C. At Toronto the following morning they were joined by two other directors, Sir Edmund Osler and W. D. Matthews and proceeded to Winnipeg, which was reached Sept. 12; another director, A. M. Nanton, of Winnipeg, joining the party there. Stops were made at several places west of Winnipeg. Vancouver was reached Sept. 15, and on the following day Lord Shaughnessy addressed the Vancouver Board of Trade. The party went by steamship to Victoria, Sept. 17, returning to Vancouver Sept. 18, whence their special train started on the eastward journey, Sept. 19, and the members arrived at their destinations, Sept. 26.

The party was accompanied by various general and local officials of the company through their respective territories.

Railway Lands Patented.—Letters patent were issued during August, in respect of Dominion Railway lands in Manitoba, Saskatchewan, Alberta, and British Columbia, as follows:

	Acres.
Calgary & Edmonton Ry.	791.00
Canadian Northern Ry.	620.00
Grand Trunk Pacific Branch Lines Co.	19.37
Kootenay Central Ry.	8.56
Qu'Appelle, Long Lake & Saskatchewan Rd. & Steamboat Co.	3,596.02
Total	5,034.95

The Grand Trunk Ry. Building, 17 to 19 Cockspur St., London, Eng., is reported to have been commandeered by the British Government. The G.T.R. will probably be allowed to retain the ground floor, but the office tenants will have to move out. It is said the offices will be used by the Department having charge of the manufacture, etc., of the new tank armored cars.

The Canadian Northern Ry. during the 12 months ended Aug. 31, handled over its lines between Lake Superior and the Rocky Mountains 109,122 cars of grain produced in its territory and inspected at Winnipeg, Calgary and other points in the west. This was an increase of 69,828 cars over the total of the previous year, and represented a gain of 178%.

Canadian Northern Ry. Collateral Trust Notes, which bear the Dominion Government's guarantee, are selling in New York to yield about 5.35%, or a little above the return on the war loan. They are secured by a general mortgage, the par value of the bonds being 133 1-8% of the note issue.

Mainly About Railway People Throughout Canada.

E. Tiffin, General Western Agent, Canadian Government Railways, and Mrs. Tiffin have taken quarters at the Carls-Rite Hotel, Toronto.

J. K. L. Ross, of Montreal, director C.P.R., has been appointed Chairman of the Pensions Board to deal with military pensions in the Dominion.

Mortimer M. McLaren has been appointed officer in charge of railway terminals at Camp Borden, Ont., with the temporary rank of major.

Lord and Lady Shaughnessy have announced the engagement of their daughter, Hon. Marguerite Shaughnessy, to E. L. Sanborn, of Havana, Cuba.

Lieut. H. G. Pepall, of the 48th Highlanders, who was wounded in action Sept. 7, is a son of G. Pepall, Assistant Foreign Freight Agent, G.T.R., Toronto.

W. R. MacInnes, Freight Traffic Manager, C.P.R., Montreal, has been elected a member of the Bank of British North America's advisory committee in Canada.

J. Murray Gibbon, General Publicity Agent, C.P.R., addressed the Calgary Ad. Club, Sept. 19, on immigration to Canada and the return of soldiers after the war.

Lieut. M. L. Duffie, of the Royal Engineers, who was on the C.P.R.'s London, Eng., staff, and was given a commission in March, 1915, has been wounded at the front.

R. W. Leonard, M.Can.Soc.C.E., formerly Chairman National Transcontinental Ry. Commission, has subscribed \$500 to the Lord Kitchener National Memorial Fund.

Mrs. Kerry, wife of J. G. G. Kerry, M.Sc., M. Can. Soc. C. E., of Kerry & Chace, Limited, engineers, Toronto, died there Sept. 5, aged 47. She was buried at Quebec, Que.

Sir William and Lady Mackenzie announce the engagement of their daughter, Miss Bertha, to Major J. F. H. McCarthy, 170th Battalion, Canadian Expeditionary Force.

F. P. Gutelius, General Manager, Canadian Government Railways, presented a silver cup for competition by I. R. C. employees at the city silver band sports at Moncton, N.B., Sept. 4.

Sir William Mackenzie, President, and **D. B. Hanna**, Third Vice President, Canadian Northern Ry., who left Toronto Aug. 24, for England, are expected back about the middle of October.

W. A. Duff, A.M.Can.Soc.C.E., Engineer of Bridges, Canadian Government Railways, Moncton, N.B., who has been suffering from blood poisoning at Halifax, N.S., has recovered and resumed his duties.

C. W. Van Buren, General Master Car Builder, C.P.R., Montreal, has been appointed a member of the standing committees on car wheels and car trucks, to report at the Master Car Builders' Association's 1917 convention.

James Coleman, Superintendent, Car Department, G.T.R., Montreal, has been appointed a member of the Master Car Builders' Association's standing committees on arbitration, and car trucks, to report at the 1917 convention.

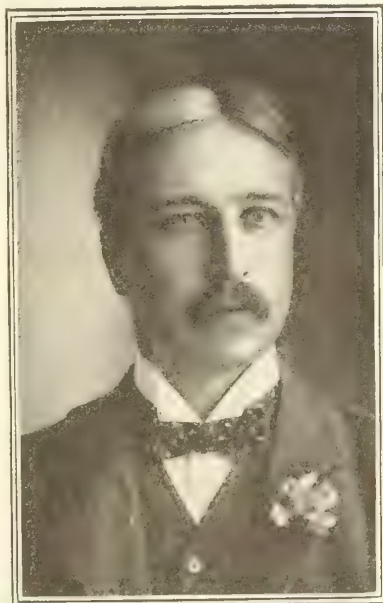
C. H. Dancer, M.Can.Soc.C.E., who until recently was Deputy Minister and Chief Engineer, Manitoba Public Works Department, has been appointed District Engineer at Winnipeg for the Dominion Public Works Department.

Captain W. A. Casey, son of the late G. E. Casey, formerly M.P. for West Elgin, Ont., who was killed in action Sept. 8, was employed on the Grand Trunk Pacific Ry. during its construction in British Columbia and was first City Engineer of Prince Rupert.

W. C. Nixon has been elected President of the recently incorporated St. Louis-San Francisco Ry., which succeeds the St. Louis & San Francisco Rd. Since July, 1913, he has been chief operating officer and receiver of the old St. Louis and San Francisco.

Lord Shaughnessy, President, C.P.R., has been elected a trustee of the Mackay Companies, which owns the Commercial Cable Co. and the Postal Telegraph Co. Two other C.P.R. directors are also trustees, viz.: Sir Edmund Osler, Toronto, and Sir Thomas Skinner, London, Eng.

H. B. Muckleston, M. Can. Soc. C.E., Assistant Chief Engineer, Irrigation Branch, Natural Resources Department,



Sir Thomas Tait
Director General of National Service.

C.P.R., who has been located at Brooks, Alta., is now a captain in the 4th Pioneers Overseas Battalion, and is in Ottawa prior to going overseas.

Col. Fred Campbell, D.S.O., M.P. for North Ayrshire, Scotland, who died in London, Eng., Sept. 4, after a brief illness, was a son of the late Archibald Campbell, of Simcoe, Ont., and a grandson of the late F. W. Cumberland, at one time Managing Director of the old Northerly Ry. of Canada.

F. Rioux, Assistant to President, Reid Newfoundland Co., St. John's, Nfld., who went overseas in July as Second Lieutenant in the British Army Service Corps, has been transferred to the Royal Engineers Railway Operating Department, R.O.D., R.E. When last heard from he was at Longmoor Camp, Hampshire, Eng.

Lt. Col. C. N. Shanly, D.S.O., of the Canadian Army Pay Corps, who died in Toronto, Sept. 7, while on leave of absence from France on account of ill health, was the last surviving son of the late Frank Shanly, civil engineer, at one time City Engineer of Toronto, and one

of the builders of the Hoosac Tunnel in Massachusetts.

A. S. Goodeve, one of the members of the Board of Railway Commissioners, Ottawa, has been notified that his son, Lieut. A. E. Goodeve of the Princess Patricia's, has been killed by the bursting of a shell over the trench in which he was at the time. Two other sons are in the Canadian Expeditionary Forces and a daughter is nursing at Salonika.

J. MacGregor, Superintending Engineer, Halifax Ocean Terminals, Intercolonial Ry., was entertained to dinner at Halifax, N.S., recently, by a number of friends, and presented with regulation military binoculars by the Board of Trade, on leaving for camp preparatory to going overseas with the 239th Construction Battalion, in which he has a commission as a Major.

E. L. Brown, Vice President and General Manager of the Denver & Rio Grande Rd., has been elected President of the Minneapolis & St. Louis Rd., succeeding Newiman Erb, resigned. Mr. Brown is 52 years old and entered the railway service as a telegraph operator. For several years previous to 1912 he was an operating official of the Northern Pacific and Great Northern railways.

Joseph A. Panter, whose appointment as Trainmaster, C.P.R., Kenora, Ont., was announced in a previous issue, was born at Toronto, Nov. 18, 1877, and entered C.P.R. service, Aug. 28, 1898, since when he has been, to April 1904, brakeman, Toronto; April 1904 to June 1908, brakeman, Calgary, Alta.; June 1908 to Nov. 1915, freight conductor, Calgary, Alta.; Nov. 1915 to April 1916, Trainmaster, Calgary, Alta.

John Calvert Carruthers, who was appointed agent G.T.R., Canadian Express Co., and Great North Western Telegraph Co., Prescott, Ont., recently was born in Edwardsburgh Tp., Ont., Jan. 11, 1876, and prior to entering transportation service, was engaged from July 1892 to Sept. 1913, with the Prescott Emery Wheel Co., Prescott, Ont., and Williams & Wilson Ltd., Montreal, respectively; Sept. 1913 to Sept. 1915, clerk, Canadian Express Co., Prescott, Ont.; Sept. 1915, to April 1916, inservice of Westinghouse Church, Kerr Co.

John Roy Shaw, who has been appointed General Agent, Passenger Department, Canadian Pacific Ocean Services, Ltd., Shanghai, China, was born at Montreal, June 28, 1871, and entered transportation service in 1885; since when he has been, to 1891 clerk in Passenger Department, G.T.R., Montreal; 1891 to 1895, clerk in Passenger Department, C.P.R., Montreal; 1895 to 1898, clerk and ticket agent, C.P.R., Boston, Mass.; 1898 to 1904, Travelling Passenger Agent, C.P.R., Boston, Mass.; Feb. 1904 to June 1916, Passenger Agent, C.P.R., Yokohama, Japan, and Hong Kong, China.

Neil Mooney, who has been appointed Assistant General Passenger Agent, New York Central Rd., New York, entered railway service in 1884, as assistant ticket agent, West Shore Rd., Buffalo, N.Y., and was from 1886 to 1887, ticket agent, same road, Niagara Falls, N.Y.; 1887 to 1888, ticket agent, Harlem Division, N.Y.C.R., New York; in 1888 he was appointed City Passenger Agent, West Shore Rd., New York, and in 1892, General Western Passenger Agent, same road, Chicago, Ill., and from Jan. 1910 to

Aug. 31, 1916, he was General Agent, Passenger Department, N. Y. C. R., Montreal.

Edward James Worth, whose appointment as Chief Dispatcher, C.P.R., Ottawa, Ont., was announced in our last issue, was born at Toronto, July 29, 1887, and entered C.P.R. service April 5, 1905, since when he has been, to June, 1907, operator at various points, Ontario Division; June 1907 to March 1908, operator at various points, Western Lines; March to July 1908, operator at various points, Ontario Division; July 1908 to April 1914, dispatcher, London, Ont.; April 1914 to Jan. 1915, Train and Station Inspector, Toronto; Jan. to Nov. 1915, dispatcher, London, Ont.; Dec. 1, 1915, to Aug. 1916, car service agent, Atlantic Division, St. John, N.B.

Capt. L. C. Ord, formerly Assistant Master Car Builder, Eastern Lines, C.P.R., Montreal, who is about to leave England for France with the 165th Siege Battery, has appealed to his friends, including members of the Canadian Railway Club, for assistance in procuring comforts, such as collapsible stoves and utensils, etc., for the battery, stating that as it is made up of reinforcements and did not go as a unit from Canada it has no battalion funds provided from Canada, and that the provision of comforts therefore falls on the officers. Contributions may be sent to Jas. Powell, Secretary, Canadian Railway Club, Box 7, St. Lambert, near Montreal.

Albert Henry Kendall, who has been appointed Master Mechanic, Ontario Division, Toronto, was born at Aspatia, Cumberland, Eng., April 4, 1878, and entered railway service in June 1901, since when he has been, to Jan. 1904, locomotive foreman, C.P.R., Nakusp and Revelstoke, B.C.; Jan. to Nov. 1904, locomotive foreman, G.T.R., London, Ont.; Nov. 1906 to July 1913, gang foreman, erecting shop foreman, and general foreman, successively, Angus Shops, C.P.R., Montreal; July to Dec. 1913, locomotive inspector, C.P.R., Kingston, Ont.; Dec. 1913 to April 1915, general foreman, C.P.R., North Bay, Ont.; April 1915 to Aug. 28, 1916, Assistant Works Manager, Angus Locomotive Shops, C.P.R., Montreal.

J. T. Hallisey, who has been appointed Superintendent, District 6, Intercolonial Ry., Truro, N.S., and granted a short leave of absence, was born at Beaver Bank, N.S., Dec. 29, 1862, and entered I.R.C. service, Dec. 12, 1879, since when he has been, to April 1882, telegraph operator; April 1882 to Nov. 1890, dispatcher, Truro, N.S.; Nov. 1890 to April 1903, Chief Dispatcher, Sydney and Oxford District, New Glasgow, N.S.; April 1903 to June 4, 1908, Chief Dispatcher, Truro, N.S.; June 4 to Nov. 1908, acting District Superintendent, Halifax and St. John District; Nov. 1908 to Dec. 1912, Superintendent, Halifax and St. John District; Dec. 1912 to Aug. 31, 1916, Superintendent, District 3. He underwent an operation at his home recently and is reported to be progressing satisfactorily.

W. R. Fitzmaurice, who has been appointed Superintendent, District 2, Intercolonial Ry., Campbellton, N.B., was born at Bedford, N.S., March 19, 1870, and entered I.R.C. service May 21, 1886, since when he has been, to 1889, operator at various stations in Nova Scotia; 1889 to 1897, assistant agent, Springhill Jct., N.S.; 1897 to 1898, agent, Oxford Jct., N.S.; 1898 to Aug. 12, 1913, agent, Amherst, N.S.; Aug. 12, 1913 to Sept. 28, 1915, assistant Superintendent, Moncton-St. Flavie District, Newcastle, N.B.;

Sept. 28, to Nov. 1915, acting Superintendent, District 2, Campbellton, N.B.; Nov. 1915 to Aug. 31, 1916, Assistant Superintendent, Moncton-St. Flavie District, Newcastle, N.B.



G. A. Montgomery
Acting General Manager, Algoma Central and
Hudson Bay Railway and Algoma Eastern
Railway.



J. S. Byrom
General Superintendent, Sleeping, Dining and
Parlor Cars and News Department, Eastern
Lines, Canadian Pacific Railway.

W. Roberts Devenish, A.M.Can.Soc.C.E., who has been appointed Superintendent, District 3, Intercolonial Ry., Moncton, N.B., was born in County Tipperary, Ireland, Nov. 21, 1882, and entered transportation service in 1903, serving with the C.P.R. for eight years in various ca-

pacities in the Engineering and Maintenance of Way Departments, from rod man to Assistant Division Engineer, Lake Superior Division. He was appointed Division Engineer, Intercolonial Ry., Moncton, N.B., in Sept. 1913, and for a time prior to that he acted as Assistant Engineer with the National Transcontinental Ry. Investigation Commission. From Nov. 1915 to Aug. 31, 1916, he was Superintendent, District 2, I.R.C., Campbellton, N.B.

R. A. Pyne, who has been appointed Superintendent Motive Power and Car Department, Eastern Lines, C.P.R., Montreal, was born at Toronto, April 10, 1874, and entered C. P. R. service in July 1887, since when he has been to May 1893, apprentice, Winnipeg; May 1893 to Dec. 1898, fitter and lathe hand, and Dec. 1898 to July 1899, gang foreman there; July 1899 to March, shop foreman, Winnipeg roundhouse; March 1901 to July 1902, erecting shop foreman, Winnipeg repair shop; July 1902 to Jan. 1903, general foreman, Calgary, Alta.; Jan. 1903 to Oct. 1906, locomotive foreman, Brandon, Man.; Oct. 1906 to April 1909, District Master Mechanic, Moose Jaw, Sask.; April 1909 to March 1910, District Master Mechanic, Nelson, B.C.; March 1910 to Jan. 1912, Master Mechanic, Alberta Division, Calgary; Jan. 1912 to Aug. 31, 1916, Superintendent of Shops, Winnipeg.

The Railway Magazine, London, Eng., in referring to the departure from England of Wm. Phillips, who represented the Canadian Northern Ry. there from 1912, first as European Traffic Manager and afterwards as European Railway and Steamship Manager, says:—"During his residence in England he has made many friends both in business and social circles, who will greatly regret his departure. Shortly after the outbreak of war the company's steamships were taken over by the government, which involved important Admiralty work, and Mr. Phillips also took a prominent part in connection with the working agreement made between the Canadian Northern and the Cunard Line, to which company the Canadian Northern steamships were transferred. Prior to his departure Mr. Phillips received from the Lord Mayor of Bristol a letter conveying the best wishes of the business community, and another from Alderman H. W. Twiggs on behalf of the Bristol Docks Committee. He was also made the recipient of a number of presentations from his staff in England."

David Morice, who has retired from active service after 52 years with the G.T.R., was born at Brantford, Ont., Oct. 31, 1851, and entered G.T.R. service Sept. 4, 1864. He was from that date to 1868, messenger and clerk at Brantford, Ont.; 1868 to Oct. 10, 1870, chief clerk, Superintendent's office, Brantford, Ont.; Oct. 10, 1870 to April 1879, same position, Stratford, Ont., where the Superintendent's office had been moved; April 1879 to Aug. 1885, Freight and Passenger Agent, Stratford, Ont.; Aug. 3, 1885 to Nov. 1891, Agent, Niagara Falls, Ont.; Nov. 1891 to Nov. 1892, Assistant Superintendent, London, Ont.; Nov. 1892 to April 1896, Assistant Superintendent, Toronto; April 1896 to Aug. 1903, Terminal Superintendent, Toronto; and Aug. 3, 1903, to the date of his retirement, Sept. 8, 1916, Freight and Customs Agent, Niagara Falls, Ont. The condition of his health, as well as that of Mrs. Morice, make it necessary that they remove from Niagara Falls, and they will in future

live in Stratford, Ont. Prior to leaving Niagara Falls, he was presented with an address and a purse of money, by a number of associates in the G.T.R. freight department and other friends.

J. S. Byrom, who has been appointed General Superintendent, Sleeping, Dining and Parlor Cars and News Service, Eastern Lines, C.P.R., Montreal, was born at Jersey City, N.Y., Feb. 10, 1872, of British parentage, and on the death of his father six months after, he was taken to Scotland, where he was educated. At the age of 15 he went to sea before the mast and for two years sailed in ships of various rigs round the British coast. In 1889 he came to Halifax, N.S., on the Allan Line s.s. Sardinian, and entered the service of the Canadian Pacific Navigation Co., at Vancouver, B.C., serving as coal trimmer, sailor and steward, successively. From the autumn of 1890 to the spring of 1895, he served as assistant and chief steward on various Pacific steamships running out of San Francisco, after which he entered the Kootenay Lakes Navigation Co.'s service as steward, and remained in that service on the absorption of the company by the C.P.R. In 1901 he returned to the Pacific coast, the C.P.R. having acquired the Canadian Pacific Navigation Co. in the previous year, and was appointed shore steward and storekeeper, including a general supervision of all marine stores and labor of the C.P.R. British Columbia Coast Service, which position he retained until his appointment as Superintendent, Great Lakes Steamship Service, C.P.R., Port McNicoll, Ont., in May 1915.

G. A. Montgomery, who has been appointed acting General Manager for the Receivers, Algoma Central and Hudson Bay Ry., and acting General Manager, Algoma Eastern Ry., Sault Ste. Marie, Ont., following on the illness and death of T. J. Kennedy, one of the Receivers, referred to in another column, was born at Bradford, Ont., Feb. 11, 1871, and entered railway service, Sept. 1, 1886, since when he has been, to Sept. 1887, assistant to agent, Northern Ry., Newmarket, Ont.; Sept. 1887 to March 1889, agent, G.T.R., Powassan, Ont.; March 1889 to March 1890, freight clerk, C.P.R., North Bay, Ont.; March 1890 to June 1893, chief clerk, freight department, C.P.R., Sudbury, Ont.; June to Aug. 31, 1893, relieving agent, C.P.R., Lake Superior Division; Aug. 31, 1893 to June 1900, chief clerk to Superintendent, District 1, Lake Superior Division, C.P.R., North Bay, Ont.; June 1900 to Aug. 28, 1902, chief clerk to General Superintendent, Algoma Central and Hudson Bay Ry., Sault Ste. Marie, Ont.; Aug. 28, 1902 to Aug. 15, 1910, Superintendent, Algoma Eastern Ry., Sudbury, Ont.; Aug. 15, 1910 to Mar. 1, 1911, Superintendent, Algoma Central and Hudson Bay Ry., Michipicoten Harbor, Ont.; March 1, 1911 to Oct. 15, 1913, Superintendent, same road, Sault Ste. Marie, Ont.; Oct. 15, 1913, to the date of his present appointment, General Superintendent, same road and Algoma Eastern Ry., Sault Ste. Marie, Ont.

F. Walker, who was, until the early part of the present year, Superintendent, District 2, Alberta Division, Lethbridge, died at Tacoma, Wash., Sept. 7, after a long illness. He was born at Pontiac, Ill., Feb. 8, 1867, and entered railway service in 1883, as operator and served in that capacity until 1885, when he was appointed operator in the general offices, Oregon Rd. and Navigation Co., Portland, Ore., since when he had been, from 1888 to 1891, dispatcher, same company, Portland, Ore.; 1891 to 1893, chief

dispatcher, Union Pacific Rd., Butte, Mont.; from 1893 he was in private business for some years, and subsequently entered C.P.R. service as operator at Winnipeg, and acted as relieving dispatcher on the Western Division, being appointed dispatcher at Fort William, Ont., in 1900, and later, trainmaster at Rat Portage, Ont.; 1901 to April 1902, chief dispatcher and trainmaster, Cranbrook, B.C.; April 1902 to July 1908, chief dispatcher, North Bay, Ont., and at Nelson, B.C., consecutively; at various periods during 1908 and 1909 he was acting superintendent, District 3, Pacific Division, Nelson, B.C.; Sept. 1910 to June 1912, chief dispatcher, District 2, British Columbia Division, Vancouver; June 1912 to Sept. 1913, Car Service Agent, Manitoba Division, Winnipeg; Sept. to Nov. 1913, car service agent, Alberta Division, Calgary; Nov. 1913 he was appointed Superintendent, District 2, Alberta Division, Lethbridge, and towards the end of 1915, he was granted leave of absence on account of ill health, and finally relinquished the position in April 1916.

Sir Thomas Tait, who has been appointed Director General of National Service, in charge, under the Premier, of the adopted regulations recently for the co-ordination of the work of all agencies connected with recruiting, was born at Melbourne, Que., July 24, 1864, and entered railway service in September 1880. Since that date he has been, to July 1887, clerk in Audit Department, G.T.R.; July to Oct. 1881, clerk in office of Assistant to President, Chicago and Grand Trunk Ry.; Oct. 1881 to April 1882, clerk in Solicitor's office, G.T.R., Belleville, Ont.; April to Oct. 1882, clerk in General Manager's office, G.T.R.; Oct. 1882 to Sept. 1886, private secretary to Vice President and General Manager, C.P.R.; Sept. 1886 to May 23, 1887, clerk in General Traffic Manager's office, C.P.R.; May 23, 1887 to Feb. 1, 1889, Assistant Superintendent, Ontario and Quebec Division, C.P.R.; April C.P.R., Moose Jaw, Sask.; Feb. 1, 1889, to Mar. 12, 1890, Superintendent, Ontario Division, C.P.R., Toronto; Mar. 12, 1890, to Mar. 1, 1893, General Superintendent, Ontario and Quebec Division, C.P.R.; Mar. 1, 1893 to May 3, 1897, Assistant General Manager, C.P.R.; May 3, 1897, to April 1901, Manager, Eastern Lines, C.P.R.; April 1901 to Mar. 1903, Manager of Transportation, C.P.R.; April 1903 to Sept. 1910, Chairman of Victorian Railway Commissioners, Australia. On his resignation in 1910, he spent some time in travelling in India and Europe, and was knighted Jan. 1, 1911. On his return to Canada, he became interested in the Fredericton and Grand Lake Coal and Ry. Co., of which he is President.

Pacific Great Eastern Ry. Aid Bonds.—The British Columbia Minister of Finance was authorized at the B. C. Legislature's last session to raise \$10,000,000, and out of this to loan to the Pacific Great Eastern Ry. \$6,000,000 to aid in finishing its construction. \$2,000,000 of the Province's 4½% gold bonds, dated July 1, 1916, and due July 1, 1925, were sold through MacNeil & Young, Toronto, the issue price being 93½ and accrued interest, yielding practically 5.35%.

Elevator for Port Stanley.—The London Railway Commission, operating the London & Port Stanley Ry. has decided to secure data at once on the cost of a large grain elevator for Port Stanley, and if the reports are favorable the London ratepayers will be asked to vote \$100,000 for the purpose at the January elections.

Handrails Etc. for Locomotives and Fenders.

The following general order 171, passed by the Board of Railway Commissioners and dated Aug. 1, was issued Aug. 31: Re the question of hand rails and small foot rests on the outside of cabs of locomotives; and a railing on the tender to prevent men from slipping off when they are passing over the tender or when the locomotive is taking coal or water. Upon hearing the matter at Ottawa, May 4, 1915, in the presence of representatives of the Brotherhood of Locomotive Engineers, the Brotherhood of Firemen and Enginemen, the Grand Trunk, Canadian Pacific and Canadian Northern Railway Companies, and the New York Central, Rutland and Michigan Central Railroad Companies, and what was alleged, and reading the replies of the railway companies interested to supplement 1 to the Board's circular 142, July 6, 1915, and the report and recommendation of the Chief Operating Officer of the Board, it is ordered:

That the railway companies be directed to equip all locomotives of 100,000 lb. or over with handrails on the sides of cabs above the windows, near the top of the cab, and running the entire length of the same, the rails to have a clearance of 2 in. between the inner side of the rail and the outside wall of the cab, and to be securely fastened at each end, with a support in the centre; and that where the running boards do not project beyond the side of the cab an additional piece be added, to project not less than 1 in. from the side of the cab and running the full length of same.

That the tender of all such locomotives be equipped with a railing on both sides, on the top of the coping; such railing, if made of round bar iron or of iron pipe, to be not less than 1 in. in diameter, supported by three columns, one at each end and one in the centre, standing 8 in. from the top of the coping; the said rails to run the full length of the fuel storage well, or clear of the back coal wall on the tender; that on the space back of the coal wall, where the water man hole is located, the coping or railing project 8 in. above the top of the tank and run around both sides and back of the tank not less than 8 in. high, supported by columns to make it secure. That plans showing the proposed foot rests and the railing on tenders be filed for the Board's approval.

That the railway companies be permitted to operate locomotives used in international traffic, and merely passing through Canadian territory, equipped in accordance with the Interstate Commerce Commission's regulations. That this permission shall not extend to locomotives operated from or entirely within Canadian territory.

The English Channel Tunnel, which it is proposed to build between Dover, England, and Calais, France, is estimated to cost \$80,000,000. An estimated income shows, \$3,120,000 from passengers, \$4,000,000 from freight, \$325,000 for baggage and \$200,000 for postal service, annually, making a total revenue of \$7,645,000. Operating expenses are placed at \$2,000,000, the balance allowing over 7% on the estimated expenditure.

J. J. Hill's Fortune.—The state of Minnesota will receive approximately \$1,250,000 as an inheritance tax from the estate of the late J. J. Hill, railway builder and operator, whose Minnesota holdings were approximately \$40,000,000.

Royal Commission of Enquiry into Canadian Railway Situation.

Two of the commissioners, viz., A. H. Smith, President, New York Central Rd., and Sir Henry L. Drayton, Chief Railway Commissioner for Canada, have started work on their investigation, but the third commissioner, Sir George Paish, of London, Eng., will, we are officially advised, be prevented from acting owing to ill health. We are also advised that the appointment of a successor is under consideration by the Government and that pending the collection of a large amount of necessary information and statistics the successor will not be required to come to Canada. From this it would appear that the appointment is to be made outside Canada.

The commissioners have opened offices in the Royal Bank Building, Ottawa, where a staff is already at work. It has been impossible to obtain a list of appointments from the commissioners but it is said that most of the staff, at least the principal members have been brought in from the United States. G. F. Swain, Professor of Civil Engineering in Harvard University, and Chairman of the Boston Transit Commission, has been employed, and W. H. Chadbourne, also from the United States, and they are said to be engaged in valuation work. Archibald Buchanan, who is said to have been at one time in the New York Central Rd.'s motive power department and also on the Central Vermont Ry., is looking into the rolling stock and terminal facilities questions. He has already been over the Canadian Northern lines west to Edmonton, Alta., and will probably go over the Grand Trunk Pacific in the near future. A London press dispatch says that Chairman Smith has appointed George A. Assiter, son of Rev. G. F. Assiter, of that city, his personal representative in the matter and that Mr. Assiter has already undertaken "a nation-wide inspection trip." The employment of aliens has caused considerable criticism and the Canadian Society of Civil Engineers has issued the following circular to its members:

The council of the Canadian Society of Civil Engineers desires to call your attention to a matter of vital interest to the society, and requests your personal action in connection therewith for the benefit of the civil engineers of Canada. The Canadian Government appointed a Commission recently to advise upon certain phases of the railway situation of the country. It is understood that the government wishes to determine whether it should continue to assist private ownership as in the past by additional loans, or take over for itself the ownership and operation of certain railways, or allow them to go into receivership. The commission consists of A. H. Smith, President, New York Central Railroad; Sir Henry Drayton, Chairman of the Board of Railway Commissioners of Canada; and Sir George Paish, financier, London, England.

The above commission immediately appointed an American engineer as its advisor, and instructed him to organize a corps of engineers for valuation and advisory work. We wish to record our strong condemnation of the policy of placing in the hands of aliens the engineering work of a commission appointed by the Canadian Government to investigate Canadian railways for which the Canadian community has paid. The inferences to be drawn from the employ-

ment of aliens in the above connection are that the Federal Government considers: 1. That the Canadian engineers who built the railways are not competent to report upon them; 2, that the Canadian universities, in many cases enjoying government subsidies, are not producing competent engineers; and 3, that the Canadian Society of Civil Engineers, although embracing a membership of about 3,000, is not considered worthy of consultation on an important engineering question.

The above mentioned appointment of alien engineers is not by any means the first of its kind, as many similar but possibly less flagrant cases have preceded it, and it is not improbable that the recurrence of such appointments may be due to the fact that Canadian engineers neither assert themselves nor demand recognition. In order to impress upon the Federal Government the fact that one of its first duties is to encourage and develop the engineering profession in Canada in every possible way, the council has selected this gross violation of a vital principle to initiate a campaign and impress the fact that Canadian engineers must receive due consideration. The Canadian railways, canals, public works and other engineering attainments are a proof that Canadian engineers stand in the front rank, and it should be quite unnecessary for them to have to appeal to their own government for recognition.

It may be argued in support of the present alien appointment that Canadian engineers are not acceptable because many have been in the employ of the railway companies. To this we would reply that, as the commission itself is to advise the government, basing itself upon the engineering data given to it, any experienced engineers are competent to collect and submit the necessary information to the commission. It may also be argued that the government gave the commission a free hand in the appointment of an engineering staff, and, since this freedom of appointment is essential, our protest should be to the commission itself. To this we reply: 1, That when a particularly flagrant case arises such as this where competent constructing and operating engineers are passed over in favor of alien engineers, the question of the suitability of the commission appointed by the government for the work in hand comes into question; 2, A protest to the commission itself would probably prove futile, and, even if successful, would not in any way impress the government, the creator of commissions, in regard to future procedure in matters of this kind. The council of the Canadian Society of Civil Engineers, therefore, asks you to use your influence in every way to diffuse a knowledge of this matter throughout your community, and to place before those with whom you may come in contact the facts of the case and the position of engineers in relation thereto.

Sir Henry L. Drayton gave out the following reply in Ottawa, Sept. 12: "Professor Swain, of Harvard University, has had a varied experience in the valuation of railways, not only from the standpoint of the investor, but also from the standpoint of the government enquiry and valuation of the lines which have been followed for the past two years by the Interstate Commerce Commission in its task of making and fixing a valuation

of all the railways of the United States, a work as yet not undertaken in Canada. Prof. Swain's experience in this connection is unique. The instructions to the commission are that the investigation and report should be made at the earliest possible moment. In view of this it was essential that an engineer of the greatest experience in such matters should be employed. Prof. Swain has, therefore, been engaged, and with him W. H. Chadbourne, who has acted in past enquiries as office assistant for Prof. Swain, and who is familiar with the proper methods to be adopted and information to be obtained. He will, in this case, as in others, act as such office assistant, in so far as work in the field is concerned, and for all outside work or further assistance which may be required, the commission intends and always has intended, to employ Canadian engineers."

Chairman Smith went over a portion of the railways in the Maritime Provinces recently, and he and Sir Henry Drayton left Toronto Sept. 18, over the Canadian Northern Ry. by special train, which comprised their two official cars and two Canadian Northern official cars for Sir Donald Mann, Vice President, F. H. Phippen, K.C., General Counsel, and W. Phillips, formerly European Railway and Steamship Manager. M. H. MacLeod, General Manager and Chief Engineer, Western Lines, met them at Port Arthur. The intention when starting was to go over the Canadian Northern to Vancouver, by steamship to Prince Rupert, by Grand Trunk Pacific via Edmonton to Calgary, by Canadian Northern from Calgary to Camrose, by Grand Trunk Pacific to Winnipeg, by National Transcontinental to Quebec and by Canadian Northern from Quebec to Montreal, which it is expected will be reached about Oct. 8.

Subscriptions to Dominion War Loan.
—Among the largest subscribers to the Canadian War Loan issued recently are the following: Canadian Pacific Railway Co., \$2,500,000; The Mackay Companies, New York, \$2,000,000; Dominion Bridge Co., Montreal, \$1,000,000; Imperial Oil Co., Sarnia, Ont., \$1,000,000; J. K. L. Ross, director, C.P.R. Montreal, \$500,000; St. Lawrence Bridge Co., Montreal, \$500,000; Imperial Oil Co.'s Officials, \$485,000; Nova Scotia Steel & Coal Co., \$250,000; Sir Herbert Holt, director, C. P. R., Montreal, \$250,000; Canadian General Electric Co., Ltd., \$250,000; James Carruthers & Co., Limited, grain exporters, Montreal, \$100,000; James Carruthers, President, Canada Steamship Lines, Ltd., Montreal, \$100,000; J. W. Norcross, Vice President & Managing Director, Canada Steamship Lines, Montreal, \$100,000; Union Steamship Co., Vancouver, \$100,000; Dominion Steel Foundry Co., Hamilton, Ont., \$100,000; Montreal Warehousing Co., Ltd., Montreal, \$100,000; Elder Dempster & Co. Ltd., Montreal, \$100,000; Lord Shaughnessy, President, C.P.R., Montreal, \$100,000; Canadian Ingersoll-Rand Co., Montreal, \$100,000; Crossen Car Co., Cobourg, Ont., \$100,000; E. T. Galt, Montreal, formerly President, Alberta Ry. & Irrigation Co., \$50,000; W. G. Ross, President, Montreal Harbor Commission, and director Montreal Tramways Co., \$50,000; Structural Steel Co. Montreal, \$50,000; and Senator Curry, President, Canadian Car & Foundry Co. Montreal, \$25,000.

Grand Trunk Pacific Railway Annual Meeting.

At the G. T. P. R. Co.'s annual meeting in Montreal, Sept. 19, the President, E. J. Chamberlin presented the following statement: Construction work during the year consisted of ballasting, bridging and rip-rapping on existing lines, but no new work of any consequence was undertaken. To comply with the Board of Railway Commissioners' orders and to give access to industries, certain construction was necessary, and this, with the minimum maintenance required to keep the railway in good working condition, covers the construction work for the year. On the Prairie Section from Winnipeg to Wolf Creek, 916 miles, the work was almost entirely confined to maintenance and renewals, with the exception of a few sidings and spurs. On the Mountain Section, from Wolf Creek to Prince Rupert, 833 miles, there were a number of minor bridge renewals, some small bridges and culverts being constructed. Considerable ballasting was done on this section, as well as right of way fencing. One hundred thousand gallon steel water tanks and stand pipes were erected at Smithers and Endako, and the water supply in connection with them completed. Owing to amendments to the land titles acts in the western provinces it was found necessary to make re-surveys by provincial land surveyors of the right of way in Alberta and Saskatchewan. This has been in continuous progress during the past year and has been completed in Alberta.

The operation of the company's lines during the year showed substantial increase in both passenger and freight traffic. Prosperous conditions developed as a result of the enormous production in Western Canada, which were reflected in passenger receipts early in the present year, when business began to show substantial improvement. In connection with the company's steamships on the Pacific Coast, service was established between Prince Rupert and Alaska to meet the demand for transportation to that territory co-incident with the railway construction and development at present taking place there by the U. S. Government, the steamships being taxed, as a rule, to their carrying capacity. The increased business, however, was more marked with the freight traffic from the very large grain crop in the west last year. The preliminary reports of the present year's crop indicate that the grain traffic this year will exceed the volume from the next largest crop in 1913, and in view of the prosperous conditions of the agricultural communities and the towns dependent upon the prosperity of agriculture, making it possible for the people not only to provide for necessities but also luxuries to which they were not previously accustomed, the indications are that a good traffic in supplies, implements, vehicles, automobiles, etc., will continue for a number of months.

Owing to the establishment of the new service to Alaska, markets have been found for the sale of central British Columbia products along the company's line, including hay, potatoes and oats, and is encouraging increased production by the settlers in that section of the province. Agricultural settlement has not shown rapid progress in any part of Western Canada during the past two years. It has not been entirely arrested, however, as during the year a fair number of settlers from the U. S. have come

in, all of them, almost without exception, are well provided with money, implements and stock to ensure their success. Large settlement has taken place during the last two years in the Edson district and it is believed the company will receive a very considerable and constantly growing traffic from that section. During the year several hundred families have located in the Salmon River Valley and in the Nechaco Valley in the Prince George district. Fruit growing has been commenced in the Kitsumgallum and Lakelse valleys, tributary to the Skeena River, with very satisfactory results, and the development has been sufficient up to the present time to create substantial and prosperous towns. Mining is also going on in northern British Columbia, tributary to the company's line, and substantial traffic is being derived from this source, discoveries of new and valuable deposits being frequently made, many of which are being followed up with the necessary development.

The directors and officers elected for the current year are: President, E. J. Chamberlin; Vice President and General Manager, M. Donaldson; Vice President and General Counsel, W. H. Biggar; Vice Presidents, J. E. Dalrymple, Frank Scott; other directors, A. W. Smithers, Sir Henry M. Jackson, Sir Felix O. Schuster, Sir Arthur Yorke, London, Eng., W. Molson Macpherson, Quebec, J. B. Fraser, Ottawa, Hon. R. Dandurand, E. B. Green-shields, H. G. Kelley, W. H. Ardley, Montreal, Jules Hone, Quebec, Peter McAra, Regina, Sask., the three latter representing the Dominion Government. J. N. Booth, of Ottawa, declined re-election, owing to ill health. Secretary, H. Phillips; Comptroller, W. H. Ardley.

The annual meetings of the various G. T. P. R. subsidiary companies, including the Telegraph, Steamship and Branch Lines Companies were held on the same and following days. The directors and officers in these companies are composed of the directors and officers of the railway company.

Canadian Northern Railway Construction, Betterments, Etc.

A press report states that the company has ordered 15,000 tons of steel rails from the United States Steel Corporation.

Mount Royal Tunnel and Terminal Co.—There has been deposited with the Secretary of State at Ottawa copy of a trust deed dated July 16, made by this company to the British Empire Trust Co., securing an issue of debenture stock and bonds in respect of the company's tunnel and terminal at Montreal.

Before leaving for England recently Sir W. Mackenzie, President, arranged a \$1,750,000 loan in New York on C. N. R. terminal securities, to be used in completing the Mount Royal tunnel and building, a passenger station on Dorchester St., Montreal.

Canadian Northern Ontario Ry.—An order has been given Roberts & Schaefer Co., engineers and contractors, Chicago, to rebuild a frame constructed automatic coaling plant at Rideau Junction, Ont., which was destroyed by fire recently.

Canadian Northern Ry.—C. N. R. officials inspected the Rice Lake mineral district of Manitoba recently with, it is said, a view of ascertaining traffic possi-

bilities. The residents of the district suggested that the company build a branch from some convenient point on its Victoria Branch line to Fort Alexander, Man.

The section of the line from Warman to Humboldt, Sask., 65 miles, is reported as being relaid with heavier steel.

A press report credits the company with having laid track on 35 miles of lines west of Easton, Sask., graded 35 miles on the Duck Lake branch, south of Dumbane, Sask., graded 47 miles on the Thunderhill branch west of Preeceville, Sask., completed the grading of the Oliver-St. Metis line, Alta., to mileage 100, and laid 40 miles of track on the same.

The Saskatchewan Government has, it is reported, been informed by M. H. MacLeod, General Manager and Chief Engineer, that construction may be started this season on the projected line from Hanna, mileage 263 on the Saskatoon-Calgary line, southerly to Medicine Hat, Sask. The report adds that the contract for grading has been let to the Cowan Construction Co., Winnipeg. Another press report states that a contract is about to be let for the grading of a 60 mile line from Hanna, north westerly through Red Deer to connect with the Vegreville-Calgary line, and the line to the Brazeau River coal fields, Alta.

We are officially advised that it is the company's intention to build a bridge across the Red Deer River, so that its line from Warden to the Brazeau River district may be taken into the town of Red Deer, Alta. A large quantity of material for the bridge has already been delivered.

We are officially advised that the store building now being erected at Edmonton, Alta., is 86 ft. long, 48 ft. wide, and 27 ft. high from base of rail to eaves, and 2 stories high. It is being built on concrete foundations, the superstructure being of brick.

A press report states that the company has completed and will open for traffic during October, a branch line of 2.5 miles from Brule, mileage 2345 on the Transcontinental line, to the Brule Lake coal field, Alta.

Canadian Northern Pacific Ry.—We are officially advised that a start has been made on the construction of the Kamloops-Okanagan branch, by the putting on of some gangs on the rockwork at Vernon, B.C. A bridge across the North Thompson River to connect the main line with the town of Kamloops is reported to be under construction.

Tenders will be received up to Oct. 2, for the erection of freight offices and freight sheds at False Creek, Vancouver.

Press reports state that track laying on the line from Victoria to Patricia Bay, on Vancouver Island, is nearly completed, and that the line is expected to be put in operation within a short time. (Sept. pg. 361.)

Canadian Northern Equipment Trust Bonds.—The C.N.R. has placed in New York recently \$1,250,000 of equipment trust bonds the proceeds of which have been used in paying for rolling stock for the Duluth, Winnipeg & Pacific and other lines.

T. H. Holmes, heretofore agent, C.P.R. Telegraphs, Brandon, Man., has been appointed agent at Ottawa, Ont., vice O. A. Jorgenson, retired.

Agitations are being worked up in Toronto and London, Ont., for extensions of the free delivery limits for express companies in those cities.

The Canadian Pacific Railway's Roll of Honor.

C. H. Buell, Staff Registrar and Secretary Passenger Department, C.P.R., has issued list 11, which is prefaced as follows: "Several thousand officers and employes of this company enlisted for active military duty with the Canadian Expeditionary Forces, and the majority of them are now in Europe bravely battling for Canada and the Empire. As particulars of army reservists are not available, these lists of those who have given up their lives for their country or been wounded in action are necessarily incomplete, and do not therefore indicate fully the extent to which the company's officers and employes have participated in the great struggle." The list follows:—

The following casualty to a member of the company's European staff, on active service, has been reported: P. T. Roberts, clerk, London, Eng., wounded.

Bear, C. S.	Baggage porter	Medicine Hat	Wounded
Carden, C. C.	Apprentice	Angus	Wounded
Clandillon, Wm. P.	Clerk	Calgary	Wounded
Dargavel, Peter	Wiper	Fort William	Wounded
Davidson, C. H.	Car heater and iceman	St. John, N.B.	Killed in action
Delemont, Leonard	Car repairer	Winnipeg	Wounded
Frizzelle, R. K.	Operator	Lake Louise	Killed in action
Gilchrist, Charles	Night cleaner	Winnipeg	Suffering from shock
Hansen, A. C.	Clerk	Calgary	Wounded
Hume, H. T.	Trainman	B. C. Div'n	Killed in action
Johnson, Harry	Private car porter	North Bay	Wounded
MacAskill, P. M.	Trainman	Cranbrook	Suffering from shock
Malcolm, Sydney	Wiper	Macleod	Wounded (2nd time)
Parsisson, Harry	Storeman	Angus	Killed in action
Piton, H. H.	Brakeman	Lethbridge	Wounded
Porter, P. R.	Clerk	Guelph	Killed in action
Reynolds, E. C.	Freight porter	Carleton Place	Suffering from shock
Salway, H. H. R.	Sectionman	Neelby	Wounded
Sharp, E. J.	Inspector	Calgary	Wounded
Shufelt, C. R.	Loco. fireman	Farnham	Wounded
Sinclair, J. C.	Material man	West Toronto	Killed in action
Smith, G. F.	Loco. fireman	North Bay	Wounded
Smith, H. E.	Clerk	Vancouver	Wounded
Smith, L. C.	Transitman	Nelson	Previously reported missing, now officially declared dead
Tate, R. W.	Machinist	Ogden	Wounded
Vidal, Cyril	Clerk	North Bay	Wounded
Voyce, J. W.	Hostler	Lambton	Killed in action
Walsh, G. V.	Stenographer	Montreal	Wounded
Walsh, Mathew	Checker	Winnipeg	Wounded
Williams, H. J.	Fitter's helper	West Toronto	Killed in action
Woodworth, Frederick	Electrician's helper	Calgary	Killed in action
Young, Norris	Pumpman	Moose Jaw	Suffering from shock

List 12.

Ascott, Thos. H.	Car cleaner	Place Viger	Wounded
Barnett, John A.	Yard clerk	Fort William	Wounded
Barr, James	Record clerk	Montreal	Wounded
Barrowman, Robert	Wiper	Wynyard	Wounded
Biggs, Ralph P.	Wiper	Swift Current	Wounded
Blair, Frank A.	Clerk	Angus	Wounded
Condon, James F. B.	Clerk	Calgary	Killed in action
Craig, Robert A.	Apprentice	Angus	Suffering from shock
Cushing, Geo. B.	Brakeman	St. John, N.B.	Wounded
Davies, Allan B.	Brakeman	Lethbridge	Wounded
Doughty, Edward S.	Land Agent	Calgary	Suffering from shock
Ferguson, James	Blacksmith's helper	Angus	Wounded
Ferguson, John	Loco. fireman	Fort William	Wounded
Fitzgerald, John E.	Brakeman	B. C. Div.	Wounded
Forster, Gordon	Assistant agent	Stonewall	Wounded
Hallett, Clarence B.	Loco. fireman	Brandon	Wounded
Hamilton, John	Labourer	McAdam Jct.	Suffering from shock
Harrison, Roy S.	Loco. fireman	West Toronto	Wounded
Hopwood, Charles	Loco. fireman	Sutherland	Killed in action
Jones, W. Leslie	Wiper	Wynyard	Killed in action
Jones, W. Sydney	Trainman	Sherbrooke	Wounded
Kennedy, Thomas	Checker	Calgary	Wounded
Kerr, Geo. Donald	Brakeman	Cranbrook	Previously reported missing, now officially declared dead
Laing, W. Reid	Crew clerk	Moose Jaw	Wounded
Legg, Percy B.	Messenger	Winnipeg	Wounded
Leonard, Charles	Yardman	Ottawa	Wounded
McDonald, A. D.	Waiter	Montreal	Wounded
McKenzie, James	Porter	Fernie	Wounded
McSwan, Donald	Waiter	Fort William	Suffering from shock
Matthews, Ray	Car checker	Calgary	Died of wounds
Miedema, Peter	Waiter	Quebec	Wounded
Moran, Richard	General helper	Angus	Wounded
Mundy, Reginald E.	Drill boy	Angus	Suffering from shock
Nimmo, Robt. C.	Constable	Montreal	Killed in action
Nisbett, John	Stationary fireman	S. Ste. Marie	Wounded
Orr, Arthur C.	Register clerk	Calgary	Wounded
Oxborough, William	Draftsman	Calgary	Wounded
Parrott, Cecil L.	Clerk	Kenora	Wounded
Patience, George	Loco. fireman	Fort William	Suffering from shock
Payce, George	Painter	North Bay	Wounded

Proposed Joint Terminals Scheme for Fort William.

The Fort William, Ont., Board of Trade sent a communication to the Board of Grain Commissioners recently, asking for the establishment at the head of the lakes of adequate terminal facilities for handling grain. The matter was taken up by the Board July 17, when representatives of Fort William and Port Arthur were present and gave their views. In reply to the views expressed at the meeting, Grant Hall, Vice President and General Manager, Western Lines, C.P.R., has written the Board of Grain Commissioners, reviewing the whole situation and presenting the C.P.R.'s views in opposition to the suggestion for joint terminals to provide for the whole grain traffic at the head of the lakes. Mr. Hall says in part:—

"It must be self evident to the Board that the railway performing the road haul can give a much cheaper terminal service than an independent company whose operations are confined to this one movement. The terminal costs to the road haul railway are only an incident in its haul. To a terminal railway it is not only its whole office, but its whole source of revenue. The separate overhead expenses, separate and distinct expenses of organization, would necessarily enhance the terminal cost of the service. The suggestion is entirely impracticable. It is impossible to segregate grain traffic from the company's other activities, and turn over to a separate company working in the same terminals, the operation of the terminals for grain only. Therefore, the joint terminal company would have to perform all the terminal service on all the traffic, whether grain or otherwise. No railway would consent to an additional and separate assessment by another company in handling its terminals, or would consent to hand over its property for this purpose."

The question of the formation of a big terminal company separate from the railways is declared to be impracticable; and the formation of a joint terminal company by the different railway companies doing business at the two points is said not to be feasible, and in summing up Mr. Hall says:—"The C.P.R. has been at a large expenditure to create its extensive terminal tracks at the lake front on plans suited to the demands of its own traffic and the interests of its patrons. Its plans for the enlargement of the same are necessarily subject to its own interests. It cannot possibly consent to have its expenditures curtailed or enhanced, as the case might be, or its plans interfered with by the necessities of the traffic of other lines or the dictation of officers of the same. . . . The company finds no reason in the representations to your Board, either in its own interests or the interest of its patrons, for making any change in the manner in which its terminal facilities are now being operated."

The Shipping Federation of British Columbia has been incorporated under the Benevolent Societies Act, with office at Vancouver, generally to look after the interests of shippers and shipping companies in the province. The incorporators are: J. R. Stuart, Secretary-Treasurer, Marine Association of British Columbia; D. Baird, Local Manager, Victoria & Vancouver Stevedoring Co.; W. M. Crawford, Manager, Empire Stevedoring & Contracting Co., and T. W. B. Loudon, Manager, Balfour, Guthrie & Co.

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Algoma Central & Hudson Bay Ry., Algoma Eastern Ry. G. A. MONTGOMERY, General Superintendent, who has been acting as General Manager for several months since the commencement of the illness of the late T. J. Kennedy, who was one of the receivers of the A. C. & H. B. R. and President of the A. E. R., is continuing in the same position pending a permanent appointment.

Canada Steamship Lines, Ltd.—J. A. GREINER has been appointed Mechanical Superintendent, vice R. Duguid resigned. Office, Montreal.

N. A. RULE, Assistant to Operating Manager, having left the service, the position has been temporarily abolished, and A. E. STINSON has been appointed dispatcher, Toronto.

Canadian Government Railways.—J. A. EVERELL has been appointed District Passenger Agent, Montreal, vice D. McDonald deceased. He will also retain his position as Superintendent, Montmorency Division, Quebec Ry. Light and Power Co., which division is to be taken over by the Dominion Government. (See also Intercolonial Ry.)

Canadian Northern Ry.—E. LABRECQUE, Soliciting Freight Agent, Quebec, Que., is reported to have been appointed City Freight Agent there, vice S. E. Leger, transferred.

S. E. LEGER, heretofore City Freight Agent, Quebec, Que., has been appointed City Freight Agent, Montreal, vice W. F. Barry, whose appointment as Commercial Agent, San Francisco, Cal., was announced in our last issue.

G. F. FOWLER, heretofore in the General Passenger Office, Toronto, has been appointed City Passenger Agent, Hamilton, Ont. This is a new position.

A. L. JOHNSTON, heretofore Travelling Passenger Agent, Winnipeg, has been appointed City Passenger Agent there, vice R. C. Curley transferred.

BARTLEY BROWN, heretofore chief rate clerk, Winnipeg, has been appointed Travelling Passenger Agent there, vice A. L. Johnston transferred.

M. J. DUPUIS has been appointed chief rate clerk, Winnipeg, vice Bartley Brown promoted.

R. F. McNAUGHTON, heretofore Travelling Passenger Agent, Edmonton, Alta., has been appointed City Ticket Agent, Regina, Sask., vice E. R. Cunningham, resigned.

R. C. CURLEY, heretofore City Passenger Agent, Winnipeg, has been appointed Travelling Passenger Agent, Edmonton, Alta., vice R. F. McNaughton, transferred.

J. S. PECK has been appointed City Ticket Agent, Edmonton, Alta., vice J. Madill, whose appointment as District Passenger Agent there, was announced in our last issue.

J. S. PECK, heretofore assistant ticket agent, has been appointed City Ticket Agent, Edmonton, Alta.

Canadian Pacific Ry.—R. A. PYNE, heretofore Superintendent of Shops, Winnipeg, has been appointed Superintendent Motive Power and Car Department, Eastern Lines, vice D. T. Main transferred. Office, Montreal.

N. R. DesBRISAY, heretofore chief clerk, Passenger Department, New York,

has been appointed District Passenger Agent, St. John, N.B., vice M. G. Murphy transferred.

C. J. KAVANAGH, heretofore Superintendent, District 4, Ontario Division,



W. R. Devenish
Superintendent, District 3, Intercolonial Railway.



A. H. Kendall
Master Mechanic, Ontario Division, Canadian Pacific Railway.

Toronto, has been appointed Superintendent, District 2 (Montreal Terminals), Eastern Division, vice J. M. Barrett resigned. Office, Montreal.

J. S. BYROM, heretofore Superinten-

dent, Great Lakes Steamers, C. P. R., Port McNicholl, Ont., has been appointed General Superintendent, Sleeping, Dining and Parlor Cars and News Service, Eastern Lines, vice A. Rutledge resigned. Office, Montreal.

THOMAS BATE, formerly at Calgary, Alta., has been appointed Assistant Works Manager, Angus Locomotive Shops, Montreal, vice A. H. Kendall, transferred.

E. A. NIX has been appointed acting Assistant Works Manager, Angus Car Shops, Montreal, vice T. C. Chown, assigned to other duties.

T. C. CHOWN, who has been acting as Assistant Works Manager, Angus Car Shops, Montreal, since the departure of L. C. ORD on active service overseas, has been appointed leading draughtsman, Mechanical Department, Montreal.

W. J. PICKRELL, heretofore Master Mechanic, Ontario Division, Toronto, has been appointed Assistant Superintendent, District 1, Eastern Division. Office, Farnham, Que.

M. G. MURPHY, heretofore District Passenger Agent, St. John, N.B., has been appointed General Agent, Passenger Department, Detroit, Mich., vice A. E. Edmonds, who is reported to have been appointed City Passenger Agent, or City Ticket Agent, there.

T. COLLINS, heretofore Superintendent, District 2, Ontario Division, London, has been appointed Superintendent, District 4, Ontario Division, vice C. J. Kavanagh, transferred to Montreal. Office, Toronto.

A. H. KENDALL, heretofore Assistant Works Manager, Angus Locomotive Shops, Montreal, has been appointed Master Mechanic, Ontario Division, vice W. J. Pickrell, transferred. Office, Toronto.

A. L. SMITH, heretofore Superintendent, District 1, Lake Superior Division, Sudbury, Ont., has been appointed Superintendent, District 2, Ontario Division, vice T. Collins transferred. Office, London.

D. T. MAIN, heretofore Superintendent of Motive Power and Car Department, Eastern Lines, Montreal, has been appointed Works Manager, Winnipeg, vice R. A. Pyne, Superintendent of Shops, transferred to Eastern Lines.

W. R. BOUCHER, heretofore Trainmaster, Assiniboia, Sask., has been appointed Superintendent, District 1, Lake Superior Division, vice A. L. Smith, transferred. Office, Sudbury, Ont.

W. M. ANSLEY, heretofore Trainmaster, Macleod, Alta., has been appointed Trainmaster, District 1, Saskatchewan Division, vice W. R. Boucher, promoted. Office, Assiniboia.

Grand Trunk Ry.—W. KEW, heretofore chief clerk, local freight department, Niagara Falls, Ont., has been appointed Freight and Customs Agent there, vice D. Morice, retired after 52 years service with the company.

J. C. L. NEWBY has been appointed chief clerk, Local Freight Department, Niagara Falls, Ont., vice W. Kew, promoted.

The following station agents have been appointed: St. Gregoire, Que., J. A. Landry; Vars, Que., J. Armstrong; Point Edward, Ont., A. Lickorish; Simcoe, Ont., E. G. Phillips; Algonquin Park, Ont., A. E. Needham.

Grand Trunk Pacific Ry.—The following station agents have been appointed: Lebret, Sask., L. Connolly; Mawer, Sask.,

F. X. Landry; Holden, Alta., T. F. Constantine; Mount Park, Alta., G. McMann.

Intercolonial Ry.—In consequence of the resignation of JAMES MacGREGOR, Superintending Engineer, Halifax Ocean Terminals, for military duties, A. C. BROWN, Resident Engineer in charge of the harbor works, will report to W. A. DUFF, Engineer of Bridges, Canadian Government Railways, Moncton, N.B., and H. H. SMITH, Resident Engineer in charge of railway construction, will report to C. B. BROWN, Chief Engineer, Canadian Government Railways, Moncton, N.B.

Districts 2 and 3 have been re-arranged, and District 6 has been created, as follows:

District 2, Mount Joli to Campbellton, Campbellton to Pacific Jct., not including Pacific Jct., Dalhousie Jct. to Dalhousie, Derby Jct. to Fredericton, Nelson Jct. to Loggieville, Campbellton to St. Leonards, and Gagetown to Centreville, 641.67 miles. W. R. FITZMAURICE, heretofore Assistant Superintendent, Moncton-St. Flavie District, Newcastle, N.B., has been appointed Superintendent, District 2, vice W. R. Devenish transferred. Office, Campbellton, N.B.

C. D. BOVARD, heretofore station agent, Moncton, N.B., has been appointed Assistant Superintendent, District 2, Campbellton, N.B. District 3, St. John to Moncton, Pacific Jct. to Truro, Pains Jct. to Point du Chene, and Sackville to Cape Tormentine, 271.17 miles.

W. R. DEVENISH, A.M.Can.Soc.C.E., heretofore Superintendent, District 2, Campbellton, N.B., has been appointed Superintendent, District 3, vice J. T. Hallisey, transferred. The office has been transferred from Truro, N.S., to Moncton, N.B.

District 6, Truro to Halifax, and Windsor Jct. to Stewart. J. T. HALLISEY, heretofore Superintendent, District 3, Truro, N.S., has been appointed Superintendent, District 6, and has been granted a short leave of absence, during which the jurisdiction of L. S. Brown, Superintendent, New Glasgow, N.S., is extended to include District 6. Office, Truro, N.S.

S. ALLANACH, heretofore Roadmaster, Fredericton Subdivision, Fredericton, N.B., has been appointed Roadmaster, Campbellton Subdivision. Office, Campbellton, N.B.

H. MORTON, heretofore chief clerk, General Manager's office, Canadian Government Railways, has been appointed Car Service Agent, I. R. C. Office, Moncton, N.B.

J. UNDERHILL, heretofore section foreman, Fredericton Subdivision, has been appointed acting Roadmaster, Fredericton Subdivision, vice S. Allanach, transferred. Office, Fredericton, N.B.

Michigan Central Rd.—H. SHEARER, heretofore Assistant General Superintendent, has been appointed General Superintendent, vice S. W. Brown. Office, Detroit, Mich.

W. H. O'KEEFE, heretofore Superintendent, Detroit Terminal and Toledo Division, Detroit, Mich., has been appointed Assistant General Superintendent, vice H. Shearer, promoted. Office, Detroit, Mich.

J. L. McKEE, heretofore Superintendent, Canada, St. Clair and Michigan Middle Divisions, St. Thomas, Ont., has been appointed Superintendent Terminals, Detroit, Mich., vice W. H. O'Keefe, promoted.

JAMES BALKWILL, heretofore Trainmaster, St. Thomas, Ont., has been appointed Division Superintendent there, vice J. L. McKee, promoted.

H. L. MARGETTS, heretofore Assistant Trainmaster, Niagara Falls, Ont., has been appointed Trainmaster with direct supervision over territory, Welland and east thereof. Office, Niagara Falls.

F. McELROY, heretofore General Yardmaster, Windsor, Ont., has been appointed Trainmaster with direct supervision over territory west of Welland, and also in charge of train crew assignments. Office, St. Thomas, Ont.

Office, St. Thomas, Ont.

New York Central Rd.—N. MOONEY, heretofore General Agent, Passenger Department, Montreal, has been appointed Assistant General Passenger Agent, New York. Office, 1216 Broadway.

A. L. MILLER has been appointed General Agent, Passenger Department, Montreal, vice Neil Mooney promoted.

Canadian Northern Railway System Annual Report.

The following report was issued recently over the signature of Sir Wm. Mackenzie, President:

Your directors in submitting the first report of The Canadian Northern Ry. System (and what otherwise would have been the 13th annual report of the Canadian Northern Ry.) for the year ended June 30, 1915, regret exceedingly having to do so at such a late date. There were, however, various reasons for the delay. A large number of head office and other employees have from time to time joined the Canadian Expeditionary Forces doing service for the Empire, and a great deal of the detail work incidental to the consolidation of the accounts of the various parts of the system had to be done by a limited staff. At present over 1,700 of your employees are attached to the service, and unhappily a number have already fallen on the several fields of battle. To the families of such employees your directors extend the sincerest sympathy, in the belief that in offering up their lives for their country's honor they have performed the highest service possible for men to do.

Another reason is that in carrying into effect the statute under which the consolidation of the companies forming part of the C. N. R. System was provided, reference to which was made in the previous annual report, an immense amount of preliminary work was necessary to co-ordinate the services and accounts of the different companies so that the best results might be attained. This statute required the preparation of a consolidated balance sheet, showing the financial position of all the companies comprised in the C. N. R. System. The financial statements submitted with the previous annual reports of the C. N. R. Co. itself, but in the financial statements submitted herewith are included the operations and accounts of the system as a whole covering the fiscal year ended June 30, 1915. In this connection your directors felt that this was an opportune time to introduce the practice of having the accounts audited by representative public chartered accountants. They, therefore, appointed Webb, Read, Hegan, Callingham & Co. to perform this service, and their certificate is attached to the consolidated balance sheet. The results of the operations of the system for the fiscal year, June 30, 1915, are as follows:

GROSS EARNINGS.	
Passenger traffic	\$5,41,224.37
Freight traffic	18,207,800.51
Express, mail, telegraph, interest and profits from elevators and other subsidiary companies, investments, etc.	2,293,081.41
	\$25,912,106.30
WORKING EXPENSES.	
Including taxes, etc.	\$19,288,814.42
Net earnings	\$6,623,291.88
Deduct:—	
Fixed charges	8,263,574.99
Net loss or deficit	\$1,640,283.11

The gross earnings of the system show a decrease of \$5,544,362.89, or 17.63%,

compared with the previous year's figures. The working expenses were 76.66% of the gross earnings of the system proper, and including taxes, 74.44% of the gross earnings from all sources, compared with 76.74% and 76.60% respectively last year.

As indicated in the report for the previous year Canada had commenced to feel the effect of a contraction in business. Real estate values and the building trades, were, as usual, the first to suffer, and carried in their wake subsidiary and dependent industries. In the throes of the trade depression came the war, the immediate effects of which were disastrous to the industrial life of the country. For weeks after the declaration of war business was practically at a standstill and the uncertainty of the future threatened to bring about a collapse of credit conditions. Faith in British power, supported by timely and generous encouragement from financial circles in London, averted disaster, and restored the country to a more normal condition, in which it regained confidence in its own inherent resources. To these troubles had been added a limited grain crop in the Western Provinces, and the C. N. R. with a large proportion of its mileage in the grain growing districts, suffered accordingly in the loss of such traffic.

It is a matter for sincere regret that notwithstanding the most rigid economy exercised in the operation of the companies' lines, the net earnings for the past year were insufficient to meet the fixed charges for the same period. It is perhaps unnecessary to say that this is the first occasion of its kind. Your directors feel, however, that having regard to the abnormal conditions which prevailed added to the fact that they exercised the closest supervision of the companies' revenues, they were able to avert even greater losses than those shown in the report.

Land sales during the year were 9,866 acres for \$158,272.40, an average of \$15.53 an acre, compared with \$15.23 for the preceding year. Land grant bonds of the issue of 1909, amounting to £122,700, or \$597,140, were retired, leaving in respect of this issue outstanding \$2,490,273.

Car trust obligations were created to the extent of \$2,000,000 for the purchase of cars of different kinds. During the year \$3,533,000.00 was repaid in respect of previous obligations, thus making a net decrease on this account for the year of \$1,533,000.00. The amount outstanding is now \$20,490,500.00, but inasmuch as the aggregate purchases of equipment amounted to \$56,761,448, it will be seen that very substantial repayments have been made on that account.

It has not been the practice in previous annual reports of the C. N. R. to incorporate in its accounts by way of an asset the value of unsold lands owned by the company. In view of the fact, however, that other subsidiary companies of our

Canadian Railway AND Marine World

ESTABLISHED 1898

Devoted to Steam and Electric Railway,
Marine, Express, Telegraph, and Railway and Canal
Contractors' Interests.

Official Organ of various Canadian Transportation
Associations.

Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C. E.
Managing Director and Editor-in Chief.

AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editors
JOHN KEIR AND DONALD F. KEIR

Canadian Business Representative,
W. H. HEWITT, 70 Bond Street, Toronto

United States Business Representative,
A. FENTON WALKER, 143 Liberty St., New York

European Business Representative,
J. MEREDITH MCKIM, 16 Regent St., London, Eng.

Authorized by the Postmaster General for Canada,
for transmission as second class matter.

Entered as second class matter, July 25, 1913, at the
Postoffice at Buffalo, N.Y., under the Act of Congress
of March 3, 1879.

SUBSCRIPTION PRICE, including postage any-
where, \$2 a year.

SINGLE COPIES, 20 cents each, including postage.

The best and safest way to remit is by express money
order. Where one cannot be obtained, a post office
money order, or bank draft, payable at par in Toronto
may be sent. Cheques or drafts not payable at par in
Toronto cannot be accepted. Remittances should be
made payable to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by
the 10th of the month preceding the date of publication.

TORONTO, CANADA, OCTOBER, 1916.

PRINCIPAL CONTENTS.

Appointments, Transportation	411
Birthdays of Transportation Men	394
Board of Railway Commissioners—	
Orders by, Summaries of	398
Traffic Orders	402
Canadian Freight Association	416
Canadian Northern Ry., Construction	409
Report	412
Canadian Pacific Ry., Construction	403
Report	397
Efficiency Testing	403
Electric Railway Department	421 to 425
Finance, Meetings, Etc.	423
Hamilton, Grimsby and Beamsville Electric Ry., Ontario's Jurisdiction Confirmed	421
Montreal Tramways Co.'s Franchise	422
Personal	422
Quebec Ry. Light and Power Co.'s Report	422
Freight and Passenger Traffic Notes	401
Grain in Store at Terminal Elevators	430
Grand Trunk Pacific Ry. Meeting	409
Mainly About Railway People	405
Marine Department	426 to 432
Canadian Lake Protective Association	431
Dominion Government and Shipbuilding	426
Sault Ste. Marie Canals Traffic	431
Vessels Registered	428
Wreck Commissioner's Judgments Criticized	432
Quebec Bridge, Collapse of Centre Span	414
Method of Handling	417
Railway Development	400
Railway Earnings	401
Railway Finance, Meetings, etc.	399
Railway Mechanical Methods and Devices	395, 396
Railway Rolling Stock Notes	404
Railway Scrap, Handling of	391
Railway Situation, Commission to Enquire Into	408
Telegraph, Telephone and Cable Matters	432

The C.P.R. has been awarded a special gold medal for a display of toys suitable for home manufacture, and a special diploma for the excellence of its agricultural exhibit at the Quebec Provincial Exhibition, held recently.

The railways operating in Ontario complied with the Ontario License Board's request and discontinued selling intoxicating liquors on their trains after Sept. 16, when the Ontario Temperance Act went into force.

system had also unsold lands amongst their assets, your directors decided to place a valuation on such lands and to include the amount in the assets of the consolidated Balance Sheet. The amount therein shown is \$20,074,380.00, represented by the following acreage in the different provinces: Manitoba and Saskatchewan, 857,720 acres; Ontario, 2,000,000 acres; Quebec, 402,860 acres. The valuation is a most conservative one, and whilst producing the amount mentioned, the sales to settlers will materially add to the traffic returns of your system in due course.

Various short term issues of secured notes and temporary loans were made during the year, the proceeds of which have been or will be applied to construction work and for the general purposes of the company.

Prior to the opening of the Transcontinental line for public service it was felt by your directors that the time was opportune to extend an invitation to the members of the Senate and House of Commons of the Dominion and representatives of leading newspapers of Eastern Canada, Chicago and New York to be the company's guests on a trip across the continent. Seventy-eight members of the Senate and House of Commons and 34 journalists accepted the invitation. The trip occupied ten days, and both from members of parliament and journalists the company received congratulations. The members presented to the executive officials an address from which is submitted the following extract: "We had not conceived it possible that a railway, possessing the standard of alignment and gradient of your road could have been constructed across Canada within so short a period. The evenness of the roadbed and the facility with which one locomotive has hauled across the continent a train near one-quarter of a mile in length (consisting of 15 heavy coaches) fully demonstrates the high standard of construction obtaining throughout the line of travel."

The main line traverses the continent from tidewater on the Atlantic at Quebec, through the provinces of Quebec, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia, to tidewater on the Pacific at Vancouver and Victoria by car ferry, with branches gridironing the grain-growing prairie provinces of the west, and with trunk lines and branches serving the main industrial centres of the east. We have the advantage of access to ocean ports on the Atlantic and Pacific, as well as to the principal ports of the Great Lakes. Our future prosperity should be assured in proportion to the prosperity of the country. We will not realize our full earning power this year, or next year, but with continued improvement in the agrarian and industrial movements of the country we should continue to show steady increases in the traffic carried and revenues earned.

There has in the past been a real need for the company's lines in the economic development of Canada. There will be the same need in the future. These lines have been located with careful regard to the development of the maximum amount of traffic. With an efficient modern equipment and a roadbed of the highest physical standard it would appear that the success of the C. N. R. as a Canadian transcontinental system is assured.

Since the close of the fiscal year business conditions have substantially improved. The placing of large orders for munitions served to revive the industrial centres of Eastern Canada, and the ris-

ing prices of cereals, beef, pork products and cheese—Canada's principal export commodities—materially increased the purchasing powers of the farming communities of the nine provinces of the Dominion. The grain crop, too, of 1915, was the best in the history of the country, the value of farm products of all Canada exceeding that of any previous year by at least \$300,000,000.

With the completion of our transcontinental line from Quebec to Vancouver towards the end of 1915, a service was established which now gives to your company the advantage of the long haul on all traffic which had heretofore been enjoyed by other intermediate carriers. As indicating the cumulative effect of better trade conditions and the operation of your company's transcontinental service, the following comparative traffic figures for the last few months will perhaps more effectively show the situation:

	1916.	1915.	Increase.	Per cent. of increase.
March	\$2,607,000	\$1,898,500	\$ 708,500	38%
April	2,824,300	1,948,900	875,400	44%
May	3,088,900	1,721,400	1,367,500	79%
June	3,377,200	1,779,600	1,697,600	90%

Port Arthur's Connection With National Transcontinental Ry.

Port Arthur, Ont., people are looking forward to the time when National Transcontinental Ry. trains will be passing through their city, and be given a connection with the main line east. A correspondent of one of the local papers wrote recently as follows:—"In order to reach the east from Fort William over its present lines, government railway trains have to travel back to Superior Jct., which is half way to Winnipeg. Then they have to travel as far east again by the main line before they are as near the east as when they started from Fort William. That is, they have travelled more than 350 miles before making any progress. It costs money to move trains too. The solution is to connect the Canadian Northern with the government railway at Long Lake, northeast of Nipigon, where the two roads are only 35 miles apart. Then, by running over the Canadian Northern to Long Lake the government road could save the 350 miles of useless and expensive haul from Fort William to Superior Jct. and back east to a point opposite Fort William."

Grain Inspection at Western Points.

The following figures compiled by the Department of Trade and Commerce, show the number of cars of grain inspected on railways at Winnipeg and other points on the Western Division for August, and for 11 months ended August 31, with a comparison of the number of cars inspected for 11 months ended August 31, 1915.

	Aug.	11 months to Aug. 31, 1916	11 months to Aug. 31, 1915
C.P.R.	10,704	192,114	61,382
C.P.R. Calgary	359	7,236	6,624
C.N.R.	7,298	108,862	38,792
G.N.R. Duluth	94	15,232	1,387
G.T.P.R.	1,155	40,595	14,646
Totals	19,610	354,039	122,831

The Timiskaming & Northern Ontario Ry. Commission has removed its head office to the Imperial Oil Building, 56 Church St., Toronto, from 25 Toronto St.

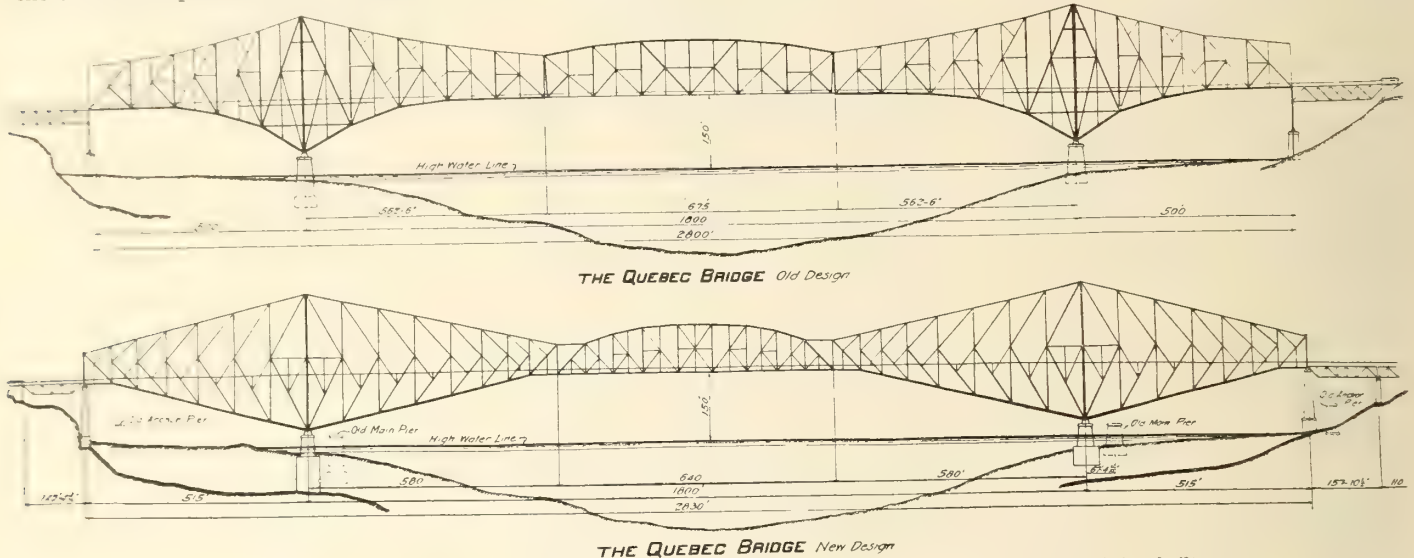
The British Government is reported to have ordered 45 narrow gauge locomotives, from the Baldwin Locomotive Works, Philadelphia, Pa.

The Falling of the Suspended Span of the Quebec Bridge.

The regrettable accident by which the suspended span of the Quebec bridge fell and was lost in the St. Lawrence River on Sept 11 has been so fully described in general terms by the daily press that it would be superfluous for us to devote space to the general details and incidents. We shall therefore confine ourselves to its technical features. Before doing so, however, we wish to emphasize the one great outstanding feature of the calamity—the admirable pluck of the contractors

lies a wreck on the bed of the St. Lawrence. Until the instant of failure the remarkably worked out programme was successful in every particular. The floating out from the erection site, the placement ready for hoisting, the connection of the truss to its lifting mechanism, the releasing from the scows, seven or eight cycles in the jacking operations—all had been performed in accordance with schedule. Then when the hosts of spectators were congratulating the engineers over

north half of the west truss robbed the mass of its diagonal support of the instant previous and allowed the north shoe of the east truss to drop back with considerable impact upon its stirrup, causing the north half of this truss, doubtless already weakened, to crumple. An instant later the southeast lifting girder tore its way free from the structure, already turning upstream, or west, and partly in the water. At this moment, apparently, both north corners still rested



Designs for Quebec Bridge, for the first one which failed in 1907, and for the second one now being built.

whose monetary loss has been so great. Instead of there being any quibbling or attempt to avoid responsibility, as occurred some years ago when one of the cantilever arms of the first bridge collapsed, the contractors at once assumed the whole responsibility and declared their intention to build another span and complete the bridge. As is generally known, the contracting company, the St. Lawrence Bridge Co., is a combination of the Dominion Bridge Co. and the Canadian

success of their work, when most of the responsible men, confident of the overcoming of all difficulties, were relaxing from the strain which so serious an operation imposed, the huge structure, without warning, slipped from its supports and in a flash disappeared in the river. The failure occurred at 10.50 a.m., 89 minutes after the barges had floated free and lifting had begun.

The sequence of failure was probably as follows: The southwest corner of the

in their stirrups. Which of these left its seat first the evidence does not yet clearly indicate, but whichever did, snapped first the mooring lines (none of which had been cast off) exerting the greatest pull on the east corner of the mooring truss, breaking in the instant previous the east set of heavy falls attached to the lower corner of the mooring truss and to the lower chord of the cantilever. This movement severely stressed this truss, warping it permanently while it



Quebec Bridge—Anchor and cantilever arms ready to receive suspended span and as they now are.

Bridge Co., the chief officials being Phelps Johnson, M.Can.Soc.C.E., President, and G. H. Duggan, M.Can.Soc.C.E., Chief Engineer. Their pluck and courage have been magnificent all through. They have the warm sympathy of the Canadian people as a whole and their best wishes for a successful consummation of the colossal work.

The suspended span of the Quebec Bridge while being hoisted to position on Sept. 11 fell from its hangers and now

span slipped out of its supporting stirrup, throwing the weight of the structure on the southeast and northwest corners. The lateral system and sway bracing developed sufficient resistance under shear to crumple the west truss in the centre of its north half. At the same time, or just previous, the top chord of the south half of this west truss pulled apart from its own weight. Simultaneously, probably, the unsupported north half of the east truss also pulled apart, or began to do so. The failure of the

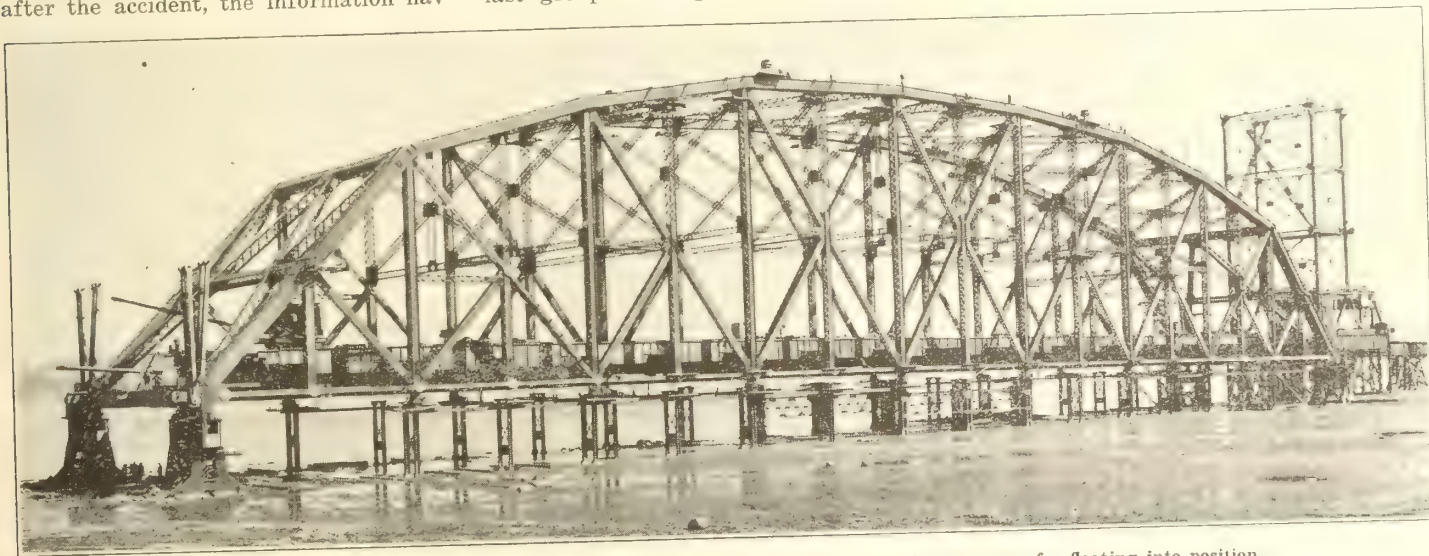
was still held by the west set of falls. By this time the north pair of hangers had undoubtedly been kicked far back, so that when the last corner of the suspended span let go it was under or even north of the mooring truss. The two lines from this corner must have swung the mooring truss north, letting it go as they snapped, so that it fell back and broke its west set of falls by its own weight. Some 12 lives, all those of workmen, were lost in the failure.

This account of what happened after

everything in the unprecedented operation of raising this 5,100-ton span of nickel had gone so smoothly that most of the distinguished engineers present had left for lunch, is based on testimony of eyewitnesses, photographs and conditions after the accident, the information hav-

tion with remarkable precision and in very short time. The hanging links of the lifting mechanism had been completely attached by 8.35, and in about 40 minutes jacking operations were started, which raised the span sufficiently for the last group of barges to float clear by

blocking on the outer end of the top chord rested a universal rocker bearing composed of a base casting bearing a pin parallel to the axis of the bridge, an intermediate casting resting on the first pin and bearing a pin at right angles to it, and a top casting resting upon the



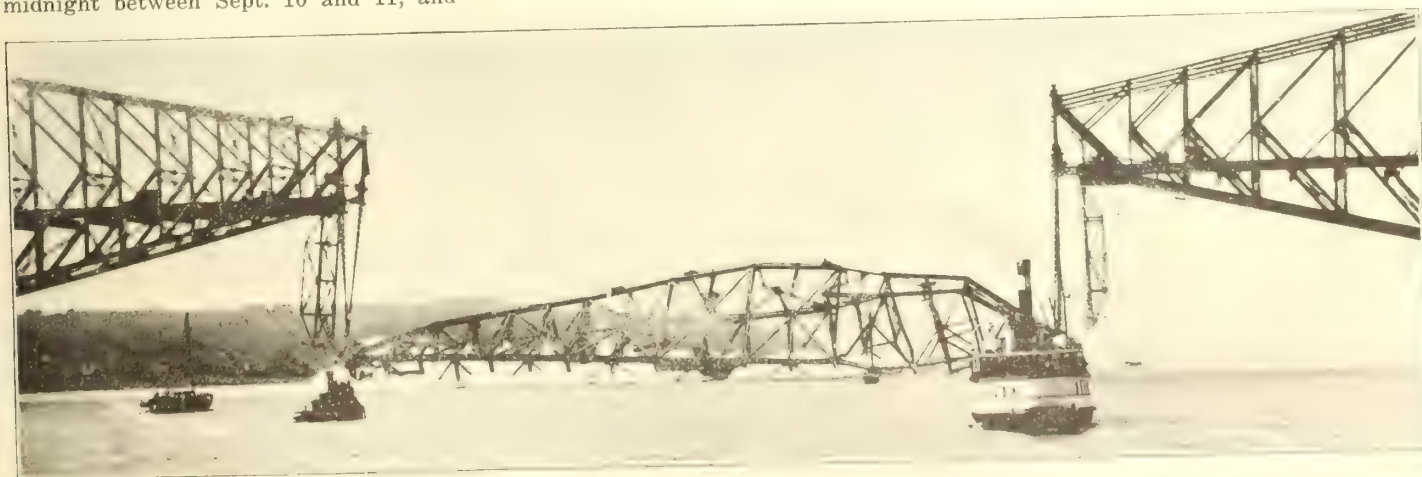
Quebec Bridge—Suspended span erected on shore at Sillery Cove, prior to placing on scows for floating into position.

ing been gathered by two representatives of the Engineering Record, who were at the site. This evidence will be presented in detail below, but for its understanding a brief review of the method employed and of the operations under way at the time is necessary. This method, which was most unusually successful in every detail up to the moment of the collapse, is fully described further on in this issue.

The span in lifting condition was completely erected at Sillery Cove, 3 miles below the site, except the floor system, of which only the floor beams and such of the centre and end panel stringers as were needed to support the hoists and platforms required during erection were in place. Beneath each end, securely fastened together, was placed a group of three specially built steel frame barges, which were blocked from the span with the remaining floor steel. Valves in these scows were closed on the rising tide at midnight between Sept. 10 and 11, and



Centre Span, Quebec Bridge, in process of being hoisted, after the withdrawal of the scows on which it was floated into position.



Falling of Centre Span, Quebec Bridge.

(Copyrighted in Canada and Great Britain by Chesterfield & McLaren.)

the span floated at 3.53 a.m., the barges drawing 8 ft. 2 in. of water. The span started to swing out into the river at 4.40 a.m., and by 5.12 a.m., when the last line to shore was cut, was in complete control of the tugs. It reached the bridge site at 6.55 a.m. and was moored in posi-

9.30 a.m. At this point breakfast was served to the men, and jacking operations were not resumed until a few minutes before the accident.

Taking one corner of one cantilever arm as a unit, the lifting mechanism may be briefly described as follows: First, on

second pin and directly supporting a short, heavy box girder. From this girder on each side of the chord hung heavy steel plate links supporting a second girder at approximately the level of the track. Both of these girders were fixed with reference to the raising of the span,

and did not change relative position during lifting operations. On the lower girder rested a pair of hydraulic jacks tested to a capacity of 1,250 tons apiece. Upon these jacks was carried a third and movable box girder similar to the first pair. Passing through diaphragms in the movable and in the lower fixed girder on each side of the truss were suspender links in 30-ft. lengths having pin holes on 6-ft. centres and extending down to the level at which the centre span was floated in. After this span was moored in place, the lower ends of these suspender chains were pinned to stub links at the corners of the suspended span. Each pair of these stub links in turn supported a fourth box girder similar to the other three upon which rested a corner of the span. The support at this point was identical with that above the top chord of the cantilever arm, and provided, by means of three castings and two pins at right angles to each other, for movement of the suspended span in any direction, due to wind pressure, without putting any bending stresses on the hangers and their connections.

At the time the span came to a bearing on these hangers, pins were inserted through the diaphragm holes of the movable girders resting on the jacks and through holes at the top of the suspender links. The jacks were at the bottom of their stroke. To raise the span, two hydraulic pumps on each cantilever arm were started, supplying pressure at 4,000 lb. per square inch to the jacks through a system of control valves which made it possible to regulate the relative movement of the corners and ends of the span very accurately. When the jacks had reached the top of their 2 ft. stroke, pins were inserted through the diaphragms of the lower fixed girders and through a lower hole in the links, thus releasing the jacks, permitting the withdrawal of the upper pins and the lowering of the movable girder for the next stroke. During the upward stroke, the movement of the hydraulic jacks was closely followed by two counterweighted screw jacks at each corner, to provide against dropping the load through any accident to the hydraulic piping. Three complete jacking cycles, the first requiring 15, the second 12, and the third 10 minutes, were completed to release the scows before work was stopped for breakfast. After work was resumed, three or four more cycles were completed and the span was held by pins in the fixed lower girders while the jacks and the upper movable girders, when, without warning, the span slid out of the hangers and plunged into the river.

That the southwest corner left its hanger first is indicated by the testimony of eyewitnesses, one of whom went down with the span, several of whom were in boats in the vicinity and looking at the span at the time and several of whom were on the banks of the river observing the span through field glasses. The testimony is confirmed by the fact that the southwest hanger remained comparatively still, while the other three hangers were violently agitated, and swung back and forth, with a movement having components transverse to and longitudinal with the bridge, for some time. This would indicate that the southwest hanger was not affected by the subsequent movements of the span before it plunged into the river, while the other three were. It is further confirmed by the positive evidence from the very remarkable photograph which shows this corner beneath the water at a time when the other three corners were still above the level of

the supports. This photograph also confirms the testimony of eyewitnesses that the span turned over toward the west in disappearing.

That the span broke up in the manner indicated by reason of the fact that it was supported for a short space of time on the southeast and the northwest corners is evidenced by eyewitnesses who saw: 1. A parting of the top chord of the west truss at the second panel from the south end. 2. A crumpling of the top chord of the west truss at the north end. 3. A pulling apart of the eye-bars in the bottom chord of the east truss at the north end.

All of these statements are confirmed by the photograph of the plunging span published herewith. They are further confirmed by the fact that the southeast and the northwest hangers sustained more damage than the other two, and that the platforms on the jacks at the top of these hangers were more completely broken up by swinging than those around the other two. The violence with which the southeast hanger tore loose from the southeast corner of the truss is evidenced by the fact that its westerly suspender bar was considerably stretched and that this is the only hanger in which the girders were thrown to any extent out of level. Also the lower pin, half of which remained in place on this hanger, was broken in two. The hanger diagonally opposite also showed some inclination, though slight, with the horizontal.

The remaining deductions, regarding the manner in which the east lower corner of the north mooring truss became warped and the blocks by which this truss was pulled out of the way while the span was being placed were broken loose, are borne out by the testimony of eyewitnesses to the fact that the truss swung violently to and fro, as did the hangers on this arm, and by the warping of the truss and the breaking loose of the falls.

So far as could be observed, without going minutely over the main trusses, no damage of any sort was sustained by them. The normal camber of the cantilever and anchor arms before taking the weight of the suspended span was visible to the eye at certain points on the structure and appeared to be unchanged after the accident from the condition obtaining on the Sunday previous. There is no testimony of any pieces of steel or rivet heads having sheared off and fallen. Locomotive cranes were operated on the structure out to the end of the cantilever arms on the afternoon of the accident without producing any motion or vibration not discernible during the preceding week—all this, in spite of the fact that for a short time during the collapse of the centre span the west truss of the north cantilever and the east truss of the south cantilever must have been under at least 100% greater load from the span than they were designed to carry. The strength of the hanger mechanism is fully attested by the fact that all four hangers are intact, as may be seen in the photographs. The fact that the inner suspender bars of each hanger are bent near the bottom is accounted for by the detail of the lower connection. A heavy box girder connected the lower ends of the inclined posts of the trusses of the suspended span, and the inner links of the suspender chains came up through the inside of this girder. It was necessary for them to tear it apart before the span could break free from the hangers. The fact that at least the calculated friction was developed by the longitudinal

pins in the shoes under the corners of the span is well attested by the manner in which the last three corners hung on until the span had broken apart.

It is not possible to suppose that the southwest stirrup could have been pulled out from under the span in any manner, both because of the fact that such a great friction was developed on the other pins because a close inspection of the mooring lines had been made a few minutes prior to the accident and because the upward motion of the span was at the time loosening instead of tightening these lines. The photographs also prove conclusively that the members of the truss itself could not have failed and thus caused the slipping out of this shoe, as the truss continued to hang on at both ends after its members had actually come apart. For these reasons the Engineering Record is led to suspect the failure of the intermediate cast steel supporting shoe as the primary cause of the loss of the span.

Burrard Inlet Tunnel & Bridge Co.

The annual meeting of the shareholders of the Burrard Inlet Tunnel and Bridge Co., consisting of representatives of the various municipalities surrounding the Inlet, was held at North Vancouver, B.C., Sept. 13. The retiring President, F. L. Carter-Cotton, was not present, and had not sent in a report. The shareholders decided to ask for one, and arranged to hold an adjourned meeting to receive it on Nov. 8.

A report of the Auditors on the company's financial standing at June 30, showed a balance on hand of \$3,062.25. The expenditure for surveys, organization, engineering, borings at site of proposed bridge, etc., to June 30, included \$3,478.27, which was expended during the year 1915-16. The company is capitalized at \$3,000,000 of which shares to the value of \$764,500 have been issued, and on which \$118,000 has been paid up.

Following are the officers, etc., for the current year: President, Mayor McBeath, Vancouver; Vice President, Reeve Bridgeman, North Vancouver; Finance Committee: Alderman Foreman, Reeve Hay, with the President and Vice President; Construction Committee: Alderman Woodside, Mayor Haynes (North Vancouver), Councillors Loutet and McClurg, acting Secretary, J. F. Collings.

Canadian Freight Association, Western Lines.

At the annual meeting in Winnipeg, recently, the following officers and standing committees were elected for the current year:—

President, W. C. Bowles, G.F.A., C.P.R., Winnipeg; Vice President, W. G. Manders, G.F.A., Canadian Northern Ry., Winnipeg.

Executive Committee: W. C. Bowles, A. E. Rosevear and W. G. Manders.

Inspection Committee: G. H. Smith, F. R. Porter, P. H. Burnham and J. M. Horn.

Car Service Committee: J. P. Driscoll, E. D. Cotterell, T. P. White, W. B. Harris, and G. P. Clarke.

Weighing Committee: W. C. Bowles, O. C. Walker, W. G. Manders, J. P. Driscoll, A. E. Rosevear and F. R. Porter.

Classification Committee: W. B. Lanigan, W. P. Hinton, G. Stephen, A. E. Rosevear, W. C. Bowles, W. G. Manders and F. R. Porter.

The Method Adopted for Hoisting the Centre Span, Quebec Bridge.

In view of the failure to hoist the centre or suspended span of the Quebec Bridge, the method adopted is of the greatest interest. The following description of it was written shortly before the attempted hoisting, by A. J. Meyers, Chief Draughtsman of the Board of Engineers in charge of construction.

The span is 640 ft. long, 88 ft. wide and weighs, in floating in condition, about

sequent stresses in the sway and lateral bracing. The inequality of pressure is proportional to the horizontal cross section of the loaded scows near the surface of the water. To reduce wave effect as much as possible, long, narrow scows with a deep draft would preferably be used. With the design of scow adopted the oscillation of the span from wave action produces only stresses in the sway

the transverse and longitudinal centre lines of the scows, or a load of 1,075 tons uniformly distributed over a length of 50 ft. at each end of the scow and symmetrically placed about its centre lines. These two conditions of loading give the largest stresses in the web members of the three longitudinal trusses. The largest stresses in the chords of these trusses are caused by a loading of 280 tons uni-

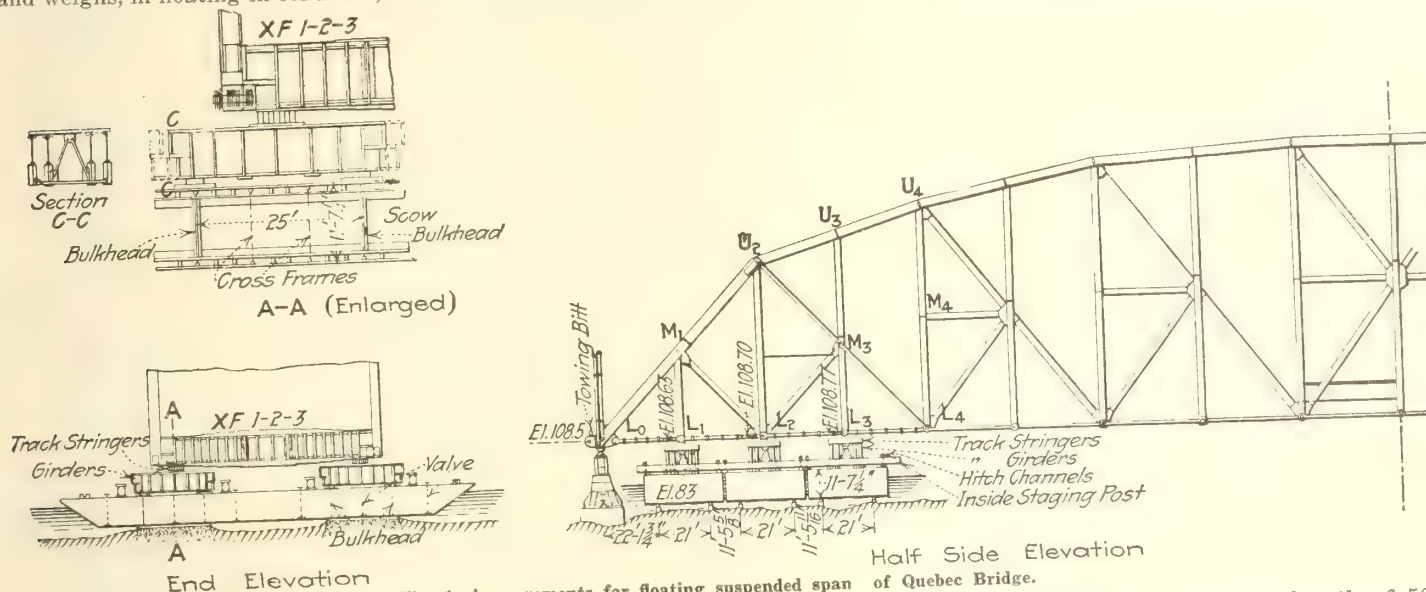


Fig. 1. Arrangements for floating suspended span of Quebec Bridge.

5,000 tons. It was erected at Sillery, about 3 miles below the bridge site, over the shallow waters of Victoria Cove. During erection it was supported on staging under each panel point; afterward the intermediate supports were removed. As shown in fig. 1, the suspended span, after it had been completely assembled and riveted up, rested on the end staging bents at L0 and L18. The scows for floating the span to the main bridge site, about 3 miles up the river, were floated into the positions shown in the diagram under panel points L1, L2, L3, L15, L16 and L17, and as the tide lowered they came to a bearing on their concrete and

and lateral bracing, which these systems are well able to resist. The scows as built are 32 ft. 5½ in. wide, 164½ ft. long and 11 ft. 7½ in. draft over bilge timbers. Each has a steel frame made up of three longitudinal trusses, spaced 10½ ft. c. to c. and braced transversely by 4 watertight steel bulkheads with intermediate crossframes between the bulkheads, spaced 8 ft. 4 in. c. to c. No special longitudinal bracing in the horizontal planes is provided, as the 11½ x 5½ in. cross timbers, spaced 2 ft. 9 in. c. to c., are bolted directly to the steel framework of the scow; and the 4-in. timber covering is spiked to these cross-

formly distributed over a length of 50 ft. on either side of, but immediately adjacent to, the transverse centre line of

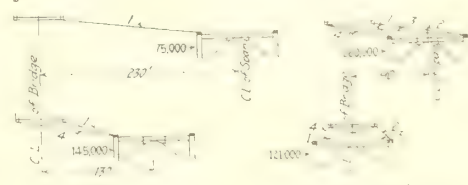


Fig. 3. Lines from centre span to mooring trusses.

the scow, or a load of 180 tons uniformly distributed over a length of 50 ft. at the centre of the scow and symmetrically

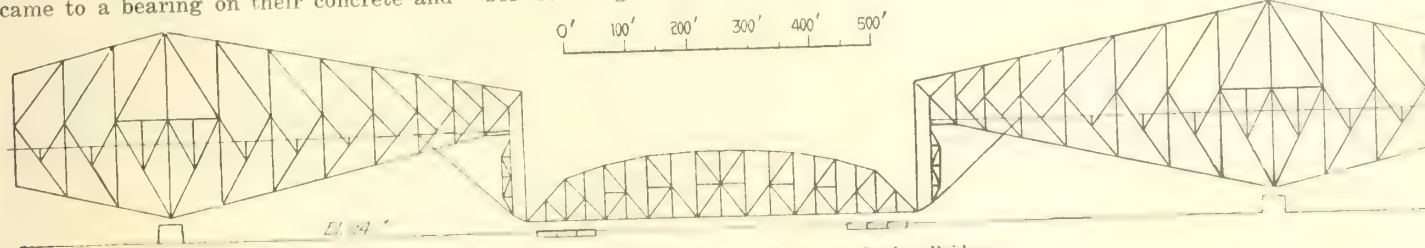


Fig. 2. General scheme for hoisting suspended span, Quebec Bridge.

timber beds. In the bottom of these scows valves are provided which were opened and will be left open until the span is to be floated, so that the scows and the span will not be disturbed by the daily rise and fall of the tide.

The design of the scows was governed by the arrangement and requirements of loading and the possible condition of the surface of the river during floating-in operations; also so that they might have some commercial value after their work of floating in the suspended span was completed. The average length from crest to crest of wave at the bridge site is about 40 ft.; the wave height is 4 ft. This unevenness of the surface of the river produces unequal upward pressures at the four corners of the span and con-

timbers with 8 x 7/16 in. boat spikes, three at each intersection, providing an efficient resistance to any transverse or longitudinal horizontal shearing and bending forces that may arise.

The load of the suspended span is transferred to the bulkheads by means of the cross-girders and I-beams shown in fig. 1. The bulkheads transfer this load to the longitudinal trusses, which distribute it over the length of the scows. In addition to the scows being designed to carry the load of the suspended span, in order that they may be used for freight carrying purposes after their work of floating in the span is completed, they are built to carry a load of 1,400 tons uniformly distributed over a length of 123 ft. and systematically placed about

placed about its centre lines.

It was assumed that the weight of the scow itself produced no stresses in the longitudinal scow trusses and that the total superimposed load was carried equally by these three trusses. In calculating the maximum bending stresses in the chords of these trusses a co-efficient of 0.75 was used to allow for continuity over the panel points. The allowable unit stresses provided for a safe unit stress in these trusses with the suspended span carried on four instead of six scows. The scows are placed under the suspended span and shimmed against the bottom flanges of the floor beams. To make sure of favorable weather conditions while the span is floating, it should be lifted from its supports at L0 and L18

only immediately before its journey to the bridge site. In order to prevent the lifting of the span by the scows when the weather conditions are not favorable, there are a number of 8-in. disc bottom valves in each scow, and these are left open. The elevations of the beds of the scows were so chosen that the scows will be emptied through these bottom valves during the last low tide before the beginning the journey to the site of the main span. The valves have a total area of one five-thousandth the clear area of the scows. All interior areas of the scows are given unobstructed access to some one of the valves, and it is esti-

cars.) The total load carried by one scow under these conditions is 970 tons, distributed over four bulkheads. The draft of the unloaded scow is $1\frac{1}{2}$ ft. and when carrying the load of 970 tons the draft is 8 ft. 2 in. The stresses in the truss members of the span while it is being supported entirely by the scows are such that a tension connection had to be provided at the joint U2; and the bottom-chord eye-bars between the panel points L0-L4 and L14-L18 had to be stiffened temporarily, as indicated in fig. 1, with longitudinal timbers and transverse blocking and bolts. The sub-tension verticals and the sub-compression diagonals

stresses arising from the action of a 4 ft. wave.

Just before the span is lifted off the supports at L0 and L18 the load is nearly all taken by the scows, and the span could be easily displaced from its position by the current and wind, unless it is anchored against their combined effect. It is desirable to prevent this shifting off before the actual moment of starting arrives, inasmuch as it may happen that after deciding to raise the span preparatory to moving out, a change in the weather conditions may make it desirable not to proceed on the journey and the span would have to be returned again to

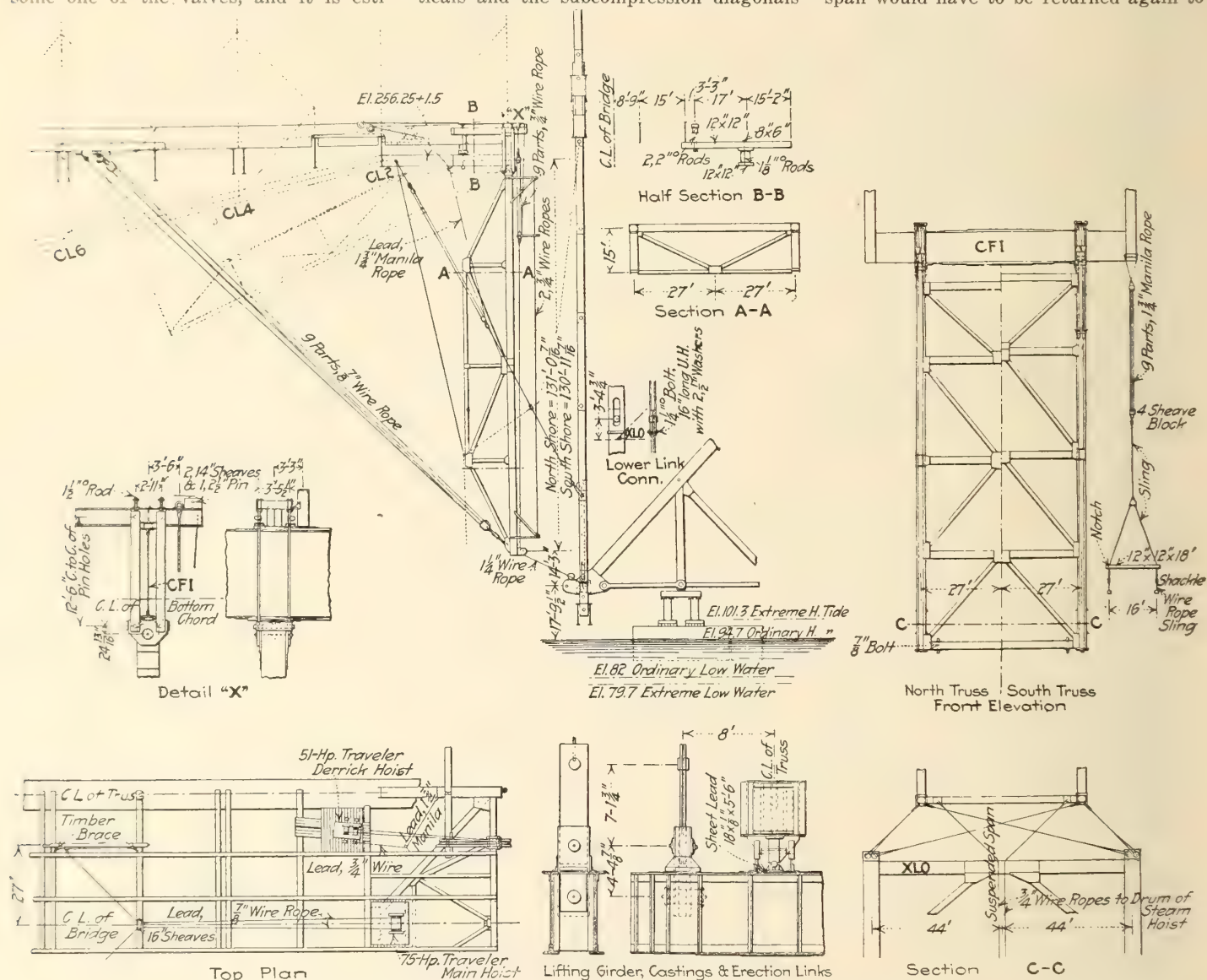


Fig. 4. Detail of arrangements for mooring and hoisting suspended span, Quebec Bridge.

ated that the water will drain out practically as fast as the tide falls.

As illustrated in fig. 1, the load of the suspended span is transferred from the floor-beams at each of the panel points L1, L2, L3, L15, L16 and L17 to the bulkheads of the scows by means of eight 24-in. 80-lb. I-beam track stringers, with their end-connection angles interlocked at the ends, and four track girders braced together by swaying frames and top laterals. These I-beam stringers and track girders are part of the permanent floor material of the span—all the floor steel and the railway track floor, except the main floor beams, being left off the span during the operation of floating-in and hoisting. (This floor material will be placed afterward by means of derrick

directly over the scows had also to be specially designed and stiffened to take reversal of stress while floating the span.

The three scows at each end of the span are braced and connected together as shown in fig. 1, by using the inside staging posts from the framework of the anchor arm as continuous connecting girders. Four of these posts are used for each set of three scows and are spaced 42 ft. c. to c. These posts were connected to the scows by means of a pair of cross channels, pin connected to vertical angles which were in turn bolted to the transverse bracing frames of the scows. Wedges were driven between the posts and the scow decks. These connections and the connecting girders were calculated to resist the bending and shearing

its bearings on the staging bents, to await the next favorable opportunity for making a trial. To keep the span in its position until the final decision to float away has been made, timber bents will be placed between the points L0 and L18 and the adjacent scows and also bents on the shore side of the span, against which the scows will guide themselves as the span is raised or lowered on its supports.

The bottoms of the scows are placed at El. 83, where they rest on bearing timbers. The bed of the river over which the scows must pass will be cleared off to El. 82. The draft of the loaded scows will be 8 ft. 2 in. In order to float the span, a high tide elevation of at least 92 ft. will be required, and in order to

drain the scows at the previous low tide an elevation of low tide of not more than 82 ft. would be expected. Inasmuch as elevations of high and low tide, as calculated from the tide tables, may vary at the erection site of the span plus or minus $2\frac{1}{2}$ ft., in order to be sure of floating off, a tide must be chosen whose elevation, as given by the tide tables, will correspond to a high-tide elevation of 94.5 ft. and a low-tide elevation of 79.5 ft., giving a range of tide of 15 ft.

Four or five days in succession, when the elevations and range of tide would be

Service at Toronto. These statements will be telephoned at about 11 a.m. and 11 p.m. respectively, with a prediction of the possible wind velocity. By barometric observations at the bridge site it can be estimated whether any threatening centres of low pressure, indicating string winds, at a great distance on the previous day, have moved more quickly or slowly than was expected. The appearance of the sky, the velocity and direction of the wind just before starting and the indications on an electric storm detector will also be well considered be-

The span on its journey to the bridge site will be towed and controlled by tugs, assisted by the westward current and influenced by the coexisting wind of unknown direction, but exerting a force of not more than 2 lb. per sq. ft. With tugs having a pulling capacity of 100,000 lb. in a 4-mile current, a velocity of the span of 4 miles per hr. can be produced relative to the water, and at the same time overcome the effect of a 2 lb. wind on the span. About 50 min. before high tide the span will be floated away from its erection site, with a westward current having

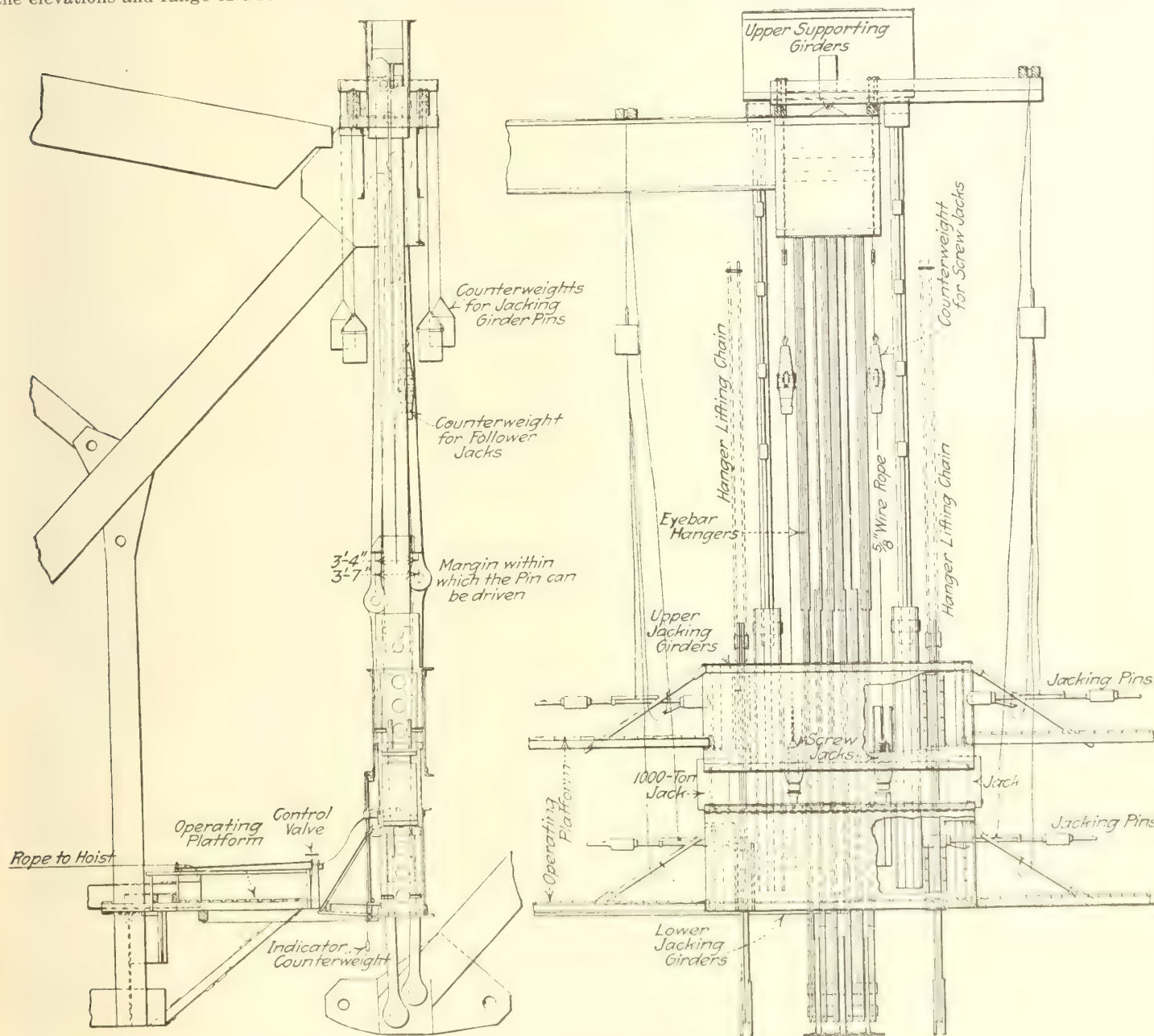


Fig. 5. Jacking equipment for hoisting suspended span, Quebec Bridge.

suitable for draining the scows and floating the span, occur at intervals of about two weeks time. The first favorable tide period, after the preparations for floating the span are complete, is about Sept. 12. If the weather conditions are not favorable during this period, it will be necessary to await the next favorable height and range of tide, and so on until suitable tide and weather conditions co-exist. A full daily statement of the meteorological conditions throughout the country giving the position of high and low pressure centres at 8 a.m. and 8 p.m. will be received from the Meteorological

fore deciding whether or not to start. It is estimated that any winds which will exert a greater pressure than 2 lb. per sq. ft. can be foreseen, and in that event no start will be made. The current velocity at the bridge site is a maximum, one hour before high tide, and is flowing westward at a rate of 6.3 to 7.3 miles per hr. in a direction which will carry the span toward the main bridge site. At high tide the current velocity is less by about 1 mile per hr. The change of current from a westward to an eastward direction, when the velocity is zero, occurs about 1 hr. after high tide.

a velocity of about 6 miles per hr. At first the tugs will be used mainly for guiding the span. While on its journey to the bridge site the rate of progress will be used mainly for guiding the span. While on its journey to the bridge site the rate of progress will be observed by means of a series of ranges placed 0.2 miles apart within 1 mile of the bridge and $\frac{1}{2}$ mile apart from 1 to 3 miles distant from the bridge. The span should arrive at the bridge with a velocity of current of about 4 miles an hr. With such a current and a wind velocity of not more than 2 miles an hr. the tugs will have

no difficulty in stopping the span before coupling up to the mooring trusses.

The time of arrival will be controlled by the tugs so that the span will be in position about half an hour after high tide, when, for a period of 1 hr., the current does not exceed 3 miles per hr. and during which it changes direction. The tugs will hold the span against the wind and current while the 1½-in. steel mooring lines are being connected, as shown in figs 3 and 4. The span will then be pulled directly under its final position in the bridge by means of these 1½-in. mooring ropes, eight in number, two connecting at each corner of the span. At the end of each rope is a loop which, as soon as the span has come within reach and the speed is controlled, will be thrown over a double-headed cast-steel snubbing block or towing bitt, bolted to a seat provided at the joint XLO of the suspended span. Each 1½-in. rope is calculated to take a pull of 75,000 lb. The ropes pass through sheaves at the lower corners of the mooring trusses and from there run vertically to the trusses, where they connect to a nine-part ¾-in. wire rope tackle, which leads back to the drums of the derrick hoists, situated on the floor at the ends of each cantilever arms.

With one line out on each end, the load for a 7-mile current and 1-lb. wind (77,500) would be carried. With two lines cut (second position, fig. 3) the upstream pull of 145,000 lb. would provide for a 7-mile current and 6-lb. wind (145,000 lb.). With all four out at each end, a 220,000-lb. force could be exerted to overcome a 7-mile current plus an 11½-mile wind (219,000 lb.). In final hoisting position the upstream force becomes 121,000 lb., which is good for a 7-mile current and a 4-lb. wind. By transferring line 1 to bitt 2 in the third position a 7-mile current and a 17-lb. wind (293,000 lb.) would be overcome; by transferring line 4 to bitt 2 in the final position a 7-mile current and a 9-lb. wind (186,000 lb.) could be provided for.

The mooring frames, as shown in figs. 2 and 4, are made of two steel trusses with bracing and are suspended from the cantilever arm floor beams at panel point CF1. They are hung at the upper ends so that they can be swung back, in order not to obstruct the channel unnecessarily, practically up against the plane of the bottom chords of the cantilever arms, by means of a nine-part ¾-in. wire-rope tackle leading from the lower corners of the trusses to the connection to the floor between panel points CF5 and CF6 of the cantilever arms and from there to the main hoists, situated at the floor level of the cantilever arms and on the centre line of the bridge. These trusses and their connections throughout were designed to take a transverse pull from the suspended span of 300,000 lb.

As soon as the span is pulled into position, before being lifted from the scows, the hanger chains will be swung down and connected through the slotted holes at the lower end to the pins at the top of the short hanger link, shown in fig 5, connecting to the supporting girders under the joint XLO. These hanger chains at each corner of the span are made up of 4 strings of slabs to each chain. Each slab is built up of two 30 x 1½-in. carbon steel plates. The allowable working erection unit stress through the pin holes was 20,000 lb. per sq. in., which included the stress from 20% of the lifted load as impact. No reinforcing pin plates were used around the pin holes, and special tests made showed that this apparently

high working stress through the pin holes was perfectly safe for this type of connection. The slabs were manufactured and shipped in lengths of about 30 ft. c. to c. of end pin holes. They were controlled after being suspended from the jacking girders by means of a two-part tackle connecting to the cantilever arm trusses at panel point CL2. The hanger chains connect at the lower end to supporting girders, shown in fig. 5. These supporting girders are 6 ft. 11½ in. back to back of angles and 25 ft. long. They are built up of two plate girders, connected together by bearing stiffening and pin connection diaphragms and also by cover plates. The load of the suspended span is transmitted to the girders by means of a cast steel rocker joint, designed to allow turning about the transverse and longitudinal axes of the bearing.

The upper supporting girders at the CUO joint of the cantilever arm are designed in a similar manner to the lower supporting girders, the rocker bearing for the girders and the pin connection for the vertical hangers allowing turning about both the transverse and longitudinal axes of the supporting girders. With bearings of this design the suspended span may move in any direction under the influence of whatever external forces from wind or current may act on it during the hoisting of the span. The total load carried by the hanger chains while lifting the span is 5,147 tons. The supporting girders, hanger chains, jacks and jacking girders and all their connections are designed throughout to carry this lifted load plus 20% impact.

As shown in fig 5 the jacking girders are located at the same elevation as the floor of the cantilever arm. They are hung from the upper supporting girders by stiff hangers that are pin connected at the upper and lower ends. At the lower ends these stiff hangers are attached to guides built of plates and angles that pass through the upper jacking girders and are riveted into the lower jacking girders. The position of the lower girders is therefore fixed, and their distance from the panel point CUO does not change during the jacking operation. The upper girders are the movable girders, and they slide up and down the guides as the 1,000-ton jacks are operated. These jacks are placed between the upper and lower jacking girders 2 at each corner of the span, and do the work of lifting the span. In order to avoid binding of the jacks, due to the deflection of the jacking girders under load, the jacks are provided with rocker seats at their upper and lower bearings. They are located at the extreme ends of the jacking girders, where they bear against transverse diaphragms riveted into the jacking girders.

In addition to the hydraulic jacks, following up screw jacks are provided as a safety device in case anything should go wrong with the pumping system for the hydraulic jacks or the jacks themselves, if they should fail to maintain the pressure of about 4,500 lb. per sq. in. necessary to hold the weight of the suspended span while being lifted. These screw jacks also react against cross girder diaphragms in the jacking girders. The screw itself is counterweighted so that practically all the friction due to its own weight is eliminated, and the operator of the screw jacks will be able to turn the screw without difficulty and follow the operations of the hydraulic jacks with equal speed and very little exertion.

The hanger lifting chains are guided between cross pin bearing diaphragms

riveted into the jacking girders. These chains are bored every 6 ft. c. to c. to receive a 12-in. pin while the cross diaphragms have holes for the same diameter of pin bored at 2 ft. centres. The clearance provided in the pin holes of the hanger chains is ½ in. transversely and ⅞ in. longitudinally, and in the pin holes of the cross-diaphragms 1 in. transversely and 1¼ in. longitudinally. This clearance is considered ample to allow the pins to be driven, no matter what position the span may take while hoisting, due to the action of current and wind. Having the pin holes in the cross diaphragms at 2-ft. centres enabled the pin holes in the hangers to be bored at 6 ft. centres and at the same time accommodated the 2 ft. stroke of the jacks.

Each operation of the jacks will lift the span 2 ft. During the lifting or upward stroke, the 12-in. pins engage the hanger chains through the diaphragms in the upper jacking girders. At the finish of the stroke the pins are entered in the diaphragms of the lower jacking girders to engage the hanger chains. The upper pins are then removed, the jacks and upper girders lowered, the upper pins again entered, the lower pins removed and jacks again operated. As each 30 ft. length of hanger chain passes up through the upper jacking girders it is disconnected and removed. The jacking pins are counter-weighted and balanced to enable them to be handled with facility by the men on the operating platform.

The jacks are supplied with water under pressure of about 4,500 lb. per sq. in. by a pair of direct acting double-plunger pumps, operated by compressed air and located on the centre line of the bridge floor at the ends of the cantilever arm. By means of a pair of control valves installed in front of the pumps the supply of water sent to each corner of the span can be regulated, and in this manner with the aid of a simple counterweighted line indicator in front of the valve operator, which will show any difference in level between the lifting girders on each side of the bridge, the two corners of each end of the span can be kept at the same elevation. Another set of valves with a similar indicator is placed on the operating platform in front of each set of jacking girders to control the water supply to each separate jack, so that the ends of the jacking girders, during jacking operations, can be kept level. The feed-pipe line is connected to the jacks by means of two ¾-in. copper pipes which are sufficiently flexible to allow for any swaying motion of the span while being hoisted.

Tests of the complete water feed pipe lines and hydraulic jacks were made under a pressure of 6,000 lb. per sq. in. The jacking girders were tested with a load on the jacks equal to 5,000 lb. per sq. in. pressure. The working load on these jacks would be about 4,500 lb. per sq. in. Each individual scow was tested for leakage after the scows were in place.

The vertical distance through which the span will be hoisted depends upon the varying elevation of the water level, but will be approximately 145 ft. Each operation of the jacks hoists the span 2 ft., and a cycle will take about 15 min. to complete. Altogether there will be approximately 73 separate lifting operations, and the time consumed from the moment of coupling up to the hanger lifting chains to the moment of driving the last pins connecting the two portions of the permanent eye-bar suspenders will be approximately 20 hrs., provided no delays occur.—Engineering News.

Electric Railway Department

Ontario's Jurisdiction Over Hamilton, Grimsby and Beamsville Electric Railway Confirmed.

The Ontario Railway and Municipal Board, on May 10, 1915, ordered the Hamilton, Grimsby & Beamsville Electric Ry. to file within 30 days complete plans and specifications for sanitary conveniences on its passenger cars and in its passenger station at Grimsby. The company appealed against the order, its principal contention being that the Ontario Board had no jurisdiction over it, but that it was under Dominion jurisdiction. On Nov. 9, 1915, the Appellate Division of the Ontario Supreme Court gave unanimous judgment dismissing the company's appeal with costs and confirming the board's order. The company then appealed to the Judicial Committee of the British Privy Council, and on July 18, 1916, the following judgment was delivered by the Lord Chancellor:—

This is an appeal of the Hamilton, Grimsby and Beamsville Ry. Co. against a judgment of the Appellate Division of the Supreme Court of Ontario, affirming an order of the Ontario Railway and Municipal Board, dated May 10, 1915. The board's order directed that the appellants should construct certain sanitary conveniences on their railway, and the appeal against that order was brought, not because the appellants objected to the construction of the sanitary conveniences, but because they asserted that the Ontario Railway and Municipal Board had no jurisdiction whatever to make the order, inasmuch as their railway was really a Dominion railway, and not in any way under the control of the Provincial Board. The facts of the case are these. The appellant company was incorporated by the Province of Ontario in 1892. The extent of the railway it was formed to construct and work is some 23 miles or thereabouts. It is worked by electric power, and it is wholly situate within the Province of Ontario. In 1895 the appellants proposed to carry their railway across the track of the Grand Trunk Ry. track, and an order was made on Jan. 28, 1895, permitting such crossing. The appellants assert that, by virtue of the British North America Act of 1867 and the Railway Act of Canada of 1888, the effect of that order was to take their railway out of the jurisdiction of the Province of Ontario and place it within the category of a Dominion railway.

The British North America Act of 1867, by sec. 92, provides that in each province the legislature may exclusively make laws in relation to matters coming within the classes of subjects that are there enumerated, and among the classes that are enumerated are local works and undertakings, other than "such works as, although wholly situate within the province, are before or after their execution declared by the Parliament of Canada to be for the general advantage of Canada or for the advantage of two or more of the provinces."

In 1888 the Railway Act of Canada was passed, and this contained certain provisions with regard to railways crossing other railways that were within the legislative authority of the Parliament of Canada. There are many sections in that statute to which reference would be

needed if it were necessary to consider exactly the terms of sec. 306 upon which the appellants rely, for it is quite true that if a comparison be made between sec. 306 and some of the other sections, a contrast will be found between the specific railways which are the subject of sec. 306 and the general terms in which all railways are referred to in the other sections. This would become a very important matter if their Lordships thought it was essential to construe sec. 306. But they do not think it is essential, for this reason, that even assuming in favor of the appellants that sec. 306 did effect a declaration within the meaning of sec. 92, sub-sec. 10 (c) of the British North America Act, and thus place the railway within the authority of the Dominion and outside the authority of the province, yet none the less that statute has been in terms repealed, and if that repeal is effectual to change the status of the appellant company, then their railway is a Dominion railway no longer, and the Ontario Railway and Municipal Board had full jurisdiction to make the order which is the subject of the appeal.

The statute which effected this repeal was passed in 1903. The repealing section is sec. 310, and that repealed in toto the previous statute, and by sec. 7 a special declaration is made with regard to railways crossing other railways that were subject to the legislative authority of the Parliament of Canada. That section runs in these terms: "Every railway, steam or electric street railway or tramway, the construction or operation of which is authorized by a special act passed by the legislature of any province now or hereafter connecting with or crossing a railway, which, at the time of such connection or crossing, is subject to the legislative authority of the Parliament of Canada, is hereby declared to be a work for the general advantage of Canada, in respect only to such connection or crossing, or to through traffic thereon, or anything appertaining thereto....."

This railway in question answers every one of the necessary conditions prescribed in the earlier part of sec. 7. If, therefore, there was power left in the legislative authority of the Dominion of Canada to pass this act, then it is obvious that, even assuming the railway had been placed within that authority by sec. 306, it is there no longer, and there is no power within the Dominion to control its affairs. Their Lordships are clearly of opinion that sec. 92, sub-sec. 10, never intended that a declaration once made by the Parliament of Canada should be incapable of modification or repeal. To come to such a conclusion would result in the impossibility of the Dominion ever being able to repair an oversight by which, even with the greatest care, mistakes frequently creep into the clauses of acts of Parliament. The declaration under sec. 92, sub-sec. 10 (c), is a declaration which can be varied by the same authority as that by which it is made. In the present case their Lordships see no reason to doubt that if the statute of 1888 effected such a declaration to place the whole rail-

way under Dominion control, that declaration has been properly and effectually varied, and the appellant company has ceased to be, even if it ever once was, under the control of the Dominion Board.

Other questions have been raised in the course of the argument, and notably one of great importance, with regard to the power of the Dominion Parliament to pass such a statute as that of 1888, on the hypothesis that sec. 306 bore the meaning for which the appellants contend. This question is of great importance, but, for the reasons that have been given, its decision is unnecessary. Their Lordships think that this appeal should be dismissed on the simple question which has already been stated. Their Lordships will therefore humbly advise His Majesty that this appeal should be dismissed with costs.

Montreal Tramways Co's Conduits.

The Montreal Tramways Co. is about to construct conduits to connect its power house, sub-stations, etc. Contracts have been let as follows: To Quinlan & Robertson Co., from Cote and Lagachetiere, along Lagachetiere to Inspector, along Inspector to St. James, along St. James to St. Remi to Notre Dame, along Notre Dame to Fourth Avenue, along Fourth Avenue to Canadian Light and Power Co. terminal, with branches on Aqueduct St. to the William St. power house, and on Glen Ave., to the St. Henry sub-station;

To G. M. Gest Co., from Cote and Lagachetiere, along Lagachetiere to Dorion, along Dorion to Notre Dame, along Notre Dame to Hochelaga power house, with branches on Sanguinet and Henri Julien Sts., to St. Denis sub-station, and on Cote St. to the proposed Cote St. sub-station.

The conduit will be 4 in. round bore, vitrified clay, with brick manholes, concrete floor and roof, cast iron frames and covers. The total trench length of the installation will be approximately nine miles. The methods of construction will be the ordinary ones on work of a similar nature.

The Peterborough Radial Ry. Co.'s corporate existence is ended, the property having been owned since Mar. 1 by the Province of Ontario and having been operated since June 1 by the Hydro Electric Power Commission of Ontario as trustee. The line will continue to be known as the Peterborough Radial Railway.

Hamilton, Ont., jitney owners have discovered that the city bylaw under which they operate does not provide for the fare to be charged for the service given. As a result there is no uniformity of charge, and drivers ask whatever fare suits them. The traffic, particularly at night, is reported to be getting into the hands of foreigners.

Brandon Municipal Ry. The Brandon, Man., City Council has under consideration a proposal to take up with the Dominion Government the question of the extension of the electric railway.

The Montreal Tramways Co's Franchise.

The Montreal Board of Control is giving a general consideration to the Montreal Tramway Co.'s franchise in the city. The matter came before the board, in its present form in a letter from E. A. Robert, President of the company, dated July 14. A report on the position of affairs, and dealing with the letter was prepared in the City Engineer's Department, and is the basis of the board's deliberations. The terms of the new franchise which Mr. Robert suggests should be given the company, are: The present franchise to be extended for 30 years, and privileges granted to carry freight, and to construct and operate an underground electric railway system. In exchange for these privileges the company will agree: To make the extensions to be presently agreed upon between the city and company. The future extensions to be made by the company as agreed upon from time to time, or in event of a disagreement between the city and the company as to the extensions asked being justified, the question to be decided by the Quebec Public Utilities Commission. The necessary right of way in all cases to be provided by the company.

The company will agree to surrender all its franchises affecting the territory now forming part of the city, and its franchises in the territory now outside of the city limits, when such territory shall form part of the city of Montreal.

The company will agree to give a uniform rate of fare of 5c on its surface line in the territory now forming part of the city of Montreal and such territory as becomes part of the city of Montreal comprised within the eastern limits of the city of Lachine, the eastern limits of Mercier Ward, the River St. Lawrence on the south and the Riviere des Prairies on the north. The company will also agree to sell on its surface lines, good for all days except Sundays and holidays, 8 tickets for 25c between 6.00 and 8.00 a.m. and between 5.00 and 7.00 p.m. and 10 tickets for 25c for school children. The fare on the underground system shall be 5c straight.

In consideration of above being accepted, the company will pay the city annually \$200,000 for the first five years, \$300,000 annually for the next five years and \$500,000 annually afterward while the contract remains in force. The exemption of taxes, enjoyed by the company in all the territory wherein it may operate to remain during the life of the contract.

A press report states that a syndicate is being formed in New York to submit a proposal for building a system of elevated railways in Montreal. Duncan McDonald, formerly General Manager Montreal Tramways Co., is said to be identified with the syndicate.

Calgary Municipal Railway Earnings.

Following are the earnings, expenses, etc., for August, and for eight months ended Aug. 31:—

	August.	8 months to Aug. 31.
Car earnings	\$57,242.58	\$390,653.55
Miscellaneous earnings ..	870.93	7,186.09
Total earnings	58,113.51	397,839.64
Operating expenses	31,242.96	237,406.51
Overhead and fixed charges	16,583.01	131,952.71
Construction and maintenance, Sarcee line	594.45	14,504.31
Total expenses	48,420.42	383,863.53
Surplus	9,693.09	13,976.11

Quebec Railway, Light, Heat and Power Co's Report and Meeting.

Following are extracts from the report for the year ended June 30, presented at the annual meeting in Montreal, Sept. 12: The gross earnings from operation for the year were \$1,731,732.49, compared with \$1,548,096.35 in 1915, an increase of \$183,636.14. Adding miscellaneous income \$236,868.93, makes a total revenue from all sources of \$1,968,601.42, an increase of \$184,527.10. The operating and maintenance expenses were \$1,029,750.96 against \$924,817.22, an increase of \$104,933.74. The fixed charges and taxes of all kinds were \$723,447.26, leaving a net surplus of \$215,403.20, which, added to the previous surplus, leaves a total surplus to date of \$562,902.65. The properties and plants of the company and its various subsidiary companies have been maintained in the same high state of efficiency as heretofore, as evidence of which there was expended during the year on maintenance accounts \$220,602.51.

Assets.	
Investments—stocks, bonds and interests in other corporations.....	\$19,181,389.43
Treasury bonds	1,742,700.00
Advanced to controlled companies for construction, etc.	1,165,251.48
General construction, etc.	528,413.29
Cash on hand and in banks	167,456.55
Accounts and bills receivable	297,637.89
Stores and supplies on hand	155,319.33
Prepaid expenses	12,089.21
	\$23,250,257.18

Liabilities.	
Capital stock	\$10,000,000
Less: Unissued	500
	\$9,999,500.00
Bonds ..	\$14,600,000
Less: In escrow to redeem bonds of subsidiary companies ..	\$3,659,000
Less cancelled ..	144,000
	3,803,000

	10,797,000.00
Bills payable	175,492.59
Accounts payable, etc.	412,222.01
Sundry loans	495,293.51
Accrued interest	129,638.87
Deferred and unclaimed interest....	548,818.21
Accrued charges, etc.	47,373.30
General suspense and reserves	82,016.04
Surplus ..	562,902.65
	\$23,250,257.18

The directors for the current year are: Sir Rodolphe Forget, President; L. C. Webster, Vice President; J. N. Green-shields, K.C., Hon. R. Mackay, L. J. Tarte, L. G. Morin, D. O. L'Esperance, Paul Galibert, C. A. Lavigne and C. Donohue. The number of directors has been reduced by one, A. Berthiaume, T. Bastien and A. Ecrement retiring, and C. A. Lavigne and C. Donohue being added.

Jitney Competition with Winnipeg Electric Railway.

During the hearing by the Manitoba Public Utilities Commission on Sept. 12 of the Winnipeg City Council's application to compel the Winnipeg Electric Ry. to build and operate an electric car line on Sargent St. from Arlington St. to Wall St., evidence was given as to the effect of jitney competition on the electric railway earnings. Wilford Phillips, General Manager and Chief Engineer, said: "We haven't the money and material to do it. The jitney business has cut the earnings of the Sargent Ave. line by nearly 40%. I would like to see the jitney business done away with altogether. It is an unfair competition to the street railway. Our franchise does not anticipate such a competition. It would cost \$10,000 to build the extension the city is asking, and we can't afford it."

R. R. Knox, Traffic Superintendent, presented a statement showing a decrease of \$550.93 in the earnings of the Sargent Ave. line during the first week in Sept., 1915, compared with the same period of the previous year. This he attributed to the activities of the jitneys. On Sept. 6, last, 46 different jitneys were in operation on this line, between 5 p.m. and 6.30 p.m. These made 188 trips and carried 474 passengers. "We have tried to combat the jitneys," said Mr. Knox, "by increasing the number of our cars, but without success. Very few of our car lines are paying."

The Commissioner reserved his decision.

A press report says that the Winnipeg Electric Ry Co. is preparing to institute suit against the city for damages, alleging that failure of the municipality to stop jitney traffic has deprived the company of half of the normal annual income. The company claims to operate under an exclusive transportation franchise.

Mainly About Electric Railway People.

Jas. Anderson, General Manager, Sand-wich, Windsor and Amherstburg Ry., is convalescent after a short illness.

Lieutenant Colonel G. C. Royce, General Manager, Toronto Suburban Ry., has been appointed Brigadier of the 9th Infantry Brigade, at present at Camp Borden, Ont.

E. S. Hughes, Traffic Manager, Windsor, Essex and Lake Shore Rapid Ry., returned to his office at Kingsville, Ont., Sept. 18, after two weeks absence through illness.

Sir Max Aitken, M.P., associated with several Canadian enterprises, and formerly living in Canada, but latterly in England, has been elected a director of the British Columbia Electric Ry. Co.

A. E. Pickering, heretofore Manager, Sault Ste. Marie, Ont., Water and Light Department, has been appointed Manager Great Lakes Power Co. and International Transit Co., Sault Ste Marie, Ont., succeeding F. E. Kruesi.

C. P. Van Norman, formerly Resident Engineer, Toronto & York Radial Ry., who enlisted for overseas service last autumn, is now a lieutenant in the 127th Battalion, York Rangers, and is stationed at Camp Borden, Ont.

Miss A. M. Grace, only daughter of J. C. Grace, Secretary, Toronto Ry., was married at Sturgeon Point, Ont., Aug. 30, to Lieut. C. J. Mitchell, of the 170th Battalion, C.E.F., of Kirkfield, Ont., and nephew of Sir Wm. Mackenzie.

G. R. G. Conway, M.I.C.E., M.Can.Soc. C.E., formerly Chief Engineer and Assistant General Manager, and now Consulting Engineer, British Columbia Electric Ry., who has been living in Toronto for the past year or two, left there Sept. 21 for Mexico City, to represent the bond holders' committees of Mexican Light and Power Co. and Mexico Tramways Co. Mrs. Conway and her family are remaining in Toronto for the present.

J. A. Everell, Superintendent, Montmorency Division, Quebec Ry. Light & Power Co., which division is to be taken over by the Dominion Government, has been appointed District Passenger Agent, Canadian Government Railways, Montreal, vice D. McDonald, deceased. The circular issued by the Canadian Government Railways' General Passenger Agent, announcing his appointment says: "Mr. Everell will also retain his position as

Superintendent of the Quebec Railway Light & Power Co."

Charles Lewis Wilson, who was elected Vice President, Canadian Electric Railway Association, for the current year, at the recent annual meeting, was born at Boston, Mass., May 23, 1871, and from 1888 to 1891, was Master Mechanic, Eureka Milling Co., Toronto; 1891 to 1892, in Freight Department, G.T.R., Montreal; 1892 to 1904, in different positions on Toronto Ry.; 1904 to 1907, Traffic Manager, Toronto and York Radial Ry., Toronto, and since 1907, Assistant General Manager, same company.

Electric Railway Notes.

The Winnipeg Electric Ry. has informed the Winnipeg Trades and Labor Council, in reply to a request to run excursion trains to the Lake Winnipeg beaches on Sundays, that it would be a direct violation of the law.

An arbitration board is being formed to settle differences between the Moose Jaw Electric Ry and its employees. Jas. Summerville was nominated Sept. 16 to represent the men. The other members of the board had not then been named.

The London & Port Stanley Ry. will almost certainly have to purchase additional rolling stock, whether the second tracking of a portion of the line is carried out or not, as it was impossible during the past summer to handle the traffic without renting a number of steam railway passenger cars.

A contemporary states that the Montreal and Southern Counties Ry. intends to construct a number of new terminals along the route between Montreal and Granby. A line usually has two terminals, one at either end, and the business of a terminal is to terminate. Our contemporary should revise its terminology.

The International Ry. which operates the Niagara Falls Park and River Ry., on Canadian territory, has granted an additional stopover privilege at the Whirlpool Rapids, to enable visitors taking the belt line route, to take advantage of the recently constructed aerial railway over the whirlpool. The only other railway of this kind is at San Sebastian, Spain.

A deputation from the Montreal building trades waited on the Board of Control, Sept. 1, to ask that the city arrange with the Montreal Tramways Co. for the transportation of freight over its lines. The want of cheap and expeditious handling of building material, and excavated material is, the deputation pointed out, interfering with the city's improvement.

The bylaw to raise \$15,000 by debentures for purchasing motor busses to be operated by the Walkerville, Ont., Town Council, was defeated by the ratepayers by a large majority, Sept. 2. The proposal was made by the council in connection with the discussion of differences with the Sandwich, Windsor & Amherstburg Ry., which operates its electric railway in the town.

British Columbia Electric Ry. employees are discussing the wages question. They allege that the general reduction made in 1915 was not warranted by conditions, and the recent difference with the electrical workers has precipitated matters. All steps taken to arrive at a settlement had failed up to Sept. 16 when the men held a mass meeting and subsequently an agreement was reached.

The Manitoba Court of Appeal has granted the Winnipeg Electric Ry. leave

to appeal the recent decision as to the electrolysis of city water pipes, which was to the effect that the Public Utilities Act was intra vires, and that the Public Utilities Commissioner had power to order the company to instal such appliances as would prevent electrolysis or materially lessen it.

There has been some difficulty between the British Columbia Electric Ry. and its linemen lately, and on Sept. 4, some of the company's officials repaired some sections of trolley wire which had become a menace to the safety of travel. As a result the difficulty has been increased. The general working conditions of the linemen are under review, and it is expected that the difficulty will be amicably settled.

M. G. Cameron, Goderich, Ont., suing for himself and other shareholders of the defunct Ontario West Shore Ry. Co. and as judgment creditor for \$128,816.66, is asking an Ontario court for a garnishee order against the City of Toronto for a balance of \$850 alleged to be due J. W. Moyes, who controlled the O. W. S. Ry., for a report on the Toronto Ry. The city denies that any balance is owing Moyes.

The Walkerville, Ont., Town Council is protesting to the Sandwich, Windsor and Amherstburg Ry., as to the service being given in the town, contending that recent records of the traffic to show that the service given does not comply with the terms of the franchise. The company was notified Sept. 12, that if the service was not improved steps would be taken to attempt to enforce the penalty clause of \$10 a day.

A deputation from the West Kildonan, Man., municipal council waited on the General Manager of the Winnipeg Electric Ry., Sept. 14, to ask for an improvement of the electric car service and a reduction of fares on the lines in the municipality. It was agreed that a 10 minute service between 9 a.m. and midnight be given in place of the present hourly service, but it was pointed out that there could be no reduction of fares at present.

A strike of union employees of the Quebec Ry. Light and Power Co. occurred, Aug. 30, during the Provincial Exhibition and traffic was disorganized for the greater part of that day. A temporary settlement was arrived at, and the service was resumed, pending the appointment of a board under the Labor Disputes Act, to enquire into the complaints. The company withdrew warrants issued against the men for breach of contract, and agreed to pay 50 per cent. of the wages for the time they were off duty. The Sillery line and the upper town line, which are operated by non-union men were not affected.

Fort William Electric Ry. Wages.

The wages of the Fort William Electric Railway employees have been advanced recently as shown below, the rates paid previously per hour being also given.

Conductors and motormen.	Old rate.	New rate.
1st 6 months	24c	26c
2nd 6 months	24c	26c
3rd 6 months	24c	26c
4th 6 months	24c	26c
5th 6 months	24c	26c
Car barns.	Old rate.	New rate.
Engineer	24c	26c
General repairer	24c	26c
Painter	24c	26c
Arm winder	30c	\$90 a month

Electric Railway Finance, Meetings, Etc.

Brandon Municipal Ry.—It is estimated that the operating loss for the current year will be \$50,000.

British Columbia Electric Ry., and allied companies:—

	July 1916	July 1915
Gross earnings	\$538,293	\$510,723
Expenses	475,093	483,881
Net earnings	63,200	26,842

Cape Breton Electric Co.—

	July 1916	July 1915	July 31, 1916	July 31, 1915
Gross	\$32,858.91	\$31,319.80	\$383,240.13	\$338,022.69
Exp.	19,171.30	17,666.29	224,906.38	206,227.88
Net	13,687.61	13,653.51	158,333.55	131,794.81

The Halifax Electric Tramway Co. declared its regular quarterly dividend of 2%, payable Oct. 2, to shareholders of record Sept. 18.

London St. Railway—

	July 1916	Aug. 1916	July 1915	Aug. 1915
Gross	\$39,505.49	\$37,827.73	\$36,895.52	\$34,273.14
Expenses	25,469.72	25,836.61	23,666.38	23,935.67
Net	14,035.77	11,991.12	13,229.14	10,337.47

Montreal Tramways Co.—The Montreal City Council claims that the Montreal Tramways Co. owes it \$194,944, and the company claims that the city owes it \$119,604.29. E. A. Robert, President of the Company, suggested to the Board of Control, Sept. 6, that the council should accept a cheque for the difference between these two amounts, and submit the other claims to a "friendly action."

Sherbrooke Ry. & Power Co.—Gross earnings for year ended June 30, issue of \$75,000 6% debentures of the \$136,178.65; operating expenses \$70,249.55; net earnings \$65,929.10, against operating expenses; \$55,643.63 net earnings for the year ended June 30, 1915.

Sudbury-Copper Cliff Suburban Electric Ry.—Brokers are offering for sale an Town of Sudbury, Ont., due Jan. 10, 1936, guaranteeing the Sudbury-Copper Cliff Suburban Electric Ry. The price is 101.46 and interest yielding 5%. The prospectus states that the railway's net earnings for the first six months of operation were \$12,000, which taken on an annual basis is enough to pay the bond interest practically six times over. A sinking fund provides for the redemption of the entire issue at maturity.

Toronto Railway—

	City 1916	City percentage	1915	City percentage
Jan.	\$473,784	\$68,847	\$471,226	\$70,486
Feb.	470,764	70,614	440,313	66,047
Mar.	518,555	97,237	488,468	93,141
Apr.	496,172	99,234	467,701	93,510
May	490,314	100,063	468,953	93,790
June	467,086	93,417	450,582	90,116
July	469,845	93,969	449,108	89,821
August	474,814	94,964	447,968	89,593

\$3,871,345 \$718,345 \$3,684,319 \$686,534

Toronto Ry., Toronto and York Radial Ry., and allied companies.—

	July 1916	July 1915	Jan. 1 to July 31, 1916	Jan. 1 to July 31, 1915
Gross	\$867,789	\$773,013	\$6,202,988	\$5,583,076
Expenses	436,735	374,637	3,172,495	2,914,954
Net	431,054	398,376	3,030,493	2,668,122

Winnipeg Electric Railway—

	July 1916	July 1915	Jan. 1 to July 31, 1916	Jan. 1 to July 31, 1915
Gross	\$242,688	\$248,022	\$1,944,162	\$2,000,278
Expenses	168,101	168,169	1,239,067	1,299,081
Net	74,587	79,853	705,095	701,197

C.P.R. Electric Railways.—The C.P.R. annual report for the year ended June 30 shows the following receipts from subsidiary electric railway companies:—Interest on bonds, Berlin, Waterloo, Wellesley & Lake Huron Ry. (Galt, Preston & Hespeler Ry.) \$17,040; dividend on Berlin, Waterloo, Wellesley & Lake Huron Ry. stock, \$12,500; interest from Hull Electric Ry., \$60,000.

Niagara Falls Park & River Railway Safety Betterments.

J. C. Royce and H. W. Middlemist, engineers for the Ontario Railway and Municipal Board, have presented the following report on the improvements which have been made on the Niagara Falls Park & River Railway recently:—On Aug. 19, accompanied by the Chairman of the Board, we conducted a test on the Queenston hill, in order to ascertain the efficiency of the new safety switch and the effect on the speed of the car produced by the change of grade and radius of curve. A car was provided by the company, whose officials were present and witnessed the test.

A test was first made of the safety switch by starting the car freely without trolley connection from the curve at Dumfries St., 200 ft. up the grade, and allowing it to accelerate to the end of the switch. The car was then taken to Dumfries St., to a point about half way between the two curves there, and started freely and allowed to attain a speed it would likely do in case of accident, and was brought to a stop at the end of the safety switch. A test was then conducted in order to ascertain the acceleration of the car from the safety switch to the end of the lower curve near the river, the radius of which had been increased to 145°, and the grade reduced to 4.2%. The car started by gravity from the switch and passed satisfactorily around the curve without the application of the brakes.

A further test was made of the braking power of the four motors which are now installed in the cars, in accordance with the Board's order. The trolley was taken off the wire and the car allowed to run free, and when it attained considerable speed, the lever on the controller was thrown into reverse position and the car was brought successfully to a standstill by the resistance of the motors only. Another test was made to ascertain the acceleration which the car would attain on the curve itself and this was found to be comparatively small on account of the curve resistance.

We consider these tests satisfactory, in so far as they show the efficiency of the safety switch, and that if a car should run freely down the grade from the safety switch it should pass around the curve at the river at a safe speed, unless power is applied by the motorman voluntarily, in which case, no precautions taken by the Board will avail. We have taken into consideration the use of a dead trolley wire between the switch and the end of the curve, as a precaution against the motorman using current and thereby attaining speed beyond the safety limit on the curve. We have decided, however, not to recommend this, as it is advantageous to have current available at all times while passing down grade, not only for operating the air brake and lighting system, but to enable the motorman to reverse his car, which would be advantageous in case of emergency.

We also called the superintendent's attention to an irregularity in the curve on the safety switch and he promised to rectify this. We would recommend that the spring frog at the safety switch be kept greased and have pointed this out to the Superintendent, who has promised to see to it.

In reference to the improvements which have been made on the N. F. P. & R. Ry. to secure greater safety it may be stated that the original construction of the portion of the line from Queenston wharf to Brock's monument required

similar methods to those used by steam railways in mountainous countries. The distance on a straight line from the top of the hill to the wharf is 2,650 ft. The difference in elevation is 293.8 ft. To descend this hill, without an excessive gradient, the line had to be lengthened. This was accomplished by constructing along its face for 2,100 ft. westerly, where it turned in an easterly direction, still on a descending grade. The length of track actually constructed between the named points was 7,500 ft. A section of track where the gradient was 5.7% at the foot of which was a curve having a radius of 115 ft., has been raised several feet at the low place recently, and the alignment has been changed so that the curve radius is now 145 ft. A new safety switch has also been installed.

Hydro Electric Radial Railways for the Niagara Peninsula.

A meeting of delegates of the Ontario Hydro Electric Railway Association was held at Hamilton, Sept. 1, when plans of the proposed railway to be built by the Ontario Hydro Electric Power Commission, between Toronto and Niagara Falls, were explained and discussed. The portion of this line between Toronto and Port Credit has already been dealt with by the various municipalities concerned, the second section, that between Port Credit and St. Catharines being one chiefly under discussion.

F. A. Gaby, Chief Engineer of the Commission, in explaining, stated that the route it was proposed to follow through Hamilton was that adopted by the Canadian Northern Ry., and it was probable that the C. N. R. right of way would be taken over and the Hamilton station located on James St., near Murray St. The line, when completed, would be available for other railway companies on terms being arranged. It was estimated that the right of way would cost \$2,000,000 and the construction, so far as Hamilton was concerned, \$2,250,000, and stations and terminals about \$500,000. The line would run from Port Credit, where a junction would be made with the proposed Toronto-London line, thence to Clarkson, through the centre of Oakville, then south of the G.T.R. and parallel with the Hamilton Radial Ry., through Burlington. From the last mentioned point two surveys had been made, one on the north and one on the south of the Plains Road. The line would cross the G.T.R. overhead and proceed along the proposed Canadian Northern Ry. route and thence to Stoney Creek, Winona, Vineland, Grimsby, Beamsville, and St. Catharines. It was intended to use 80 lb. steel, and the whole equipment would be of the highest class, with rolling stock similar to that used on the London and Port Stanley Ry. Mr. Gaby also stated that four lines had been surveyed from St. Catharines to Niagara Falls, and the Commission was of opinion that two lines would be required, one to go via Port Robinson, and one by a more direct route.

The Hamilton Board of Control had a conference with J. N. Stanley, Assistant Engineer of the Commission, and subsequently a report was made to the City Council, showing that the estimated cost of building the line from Port Credit to St. Catharines was \$8,935,363, including stations and terminals. Car shops and rolling stock were estimated at \$425,000, the gross total cost being \$11,360,363. It was also stated that a subsidy of \$6,400 a mile on the 59.57 miles would produce

\$381,248, and reduce the cost to \$10,979,115.

On Sept. 18, the councils of St. Catharines City, Lincoln County, and Louth and Grantham Tps. passed resolutions endorsing the proposal. J. N. Stanley, Assistant Engineer, informed the St. Catharines Council, that the Commission intended to reach Niagara Falls, but as there was already a line between St. Catharines and Niagara Falls, it was considered that the line to Port Credit would be sufficiently large for a separate undertaking. He stated that the cost of construction would be divided between the municipalities concerned according to assessment.

At a special meeting of the Hamilton City Council, Sept. 19, a resolution was passed endorsing the scheme, but the council declined to approve of any definite route through the city until route plans had been considered by it.

Toronto Suburban Railway Deviation at Lambton.

The Ontario Railway and Municipal Board has issued its order authorizing the Toronto Suburban Ry. to deviate its Dundas St. line at Lambton Mills, to a private right of way owned by the company. The order is as follows: Upon the application of the Toronto Suburban Ry. Co. and upon hearing counsel for the applicant and for York Tp. and the City of Toronto having, at the hearing, applied to be made parties thereto, the Board was pleased to direct that counsel for the City of Toronto should also be heard, but that the said city shall not be made parties hereto, and the said application having come on for judgment, the Board orders that the plans, profiles and book of reference filed with the Board showing the proposed deviation, be approved, and the company is directed to make the deviation, subject to the conditions of, and in accordance with the agreements between the parties and the statutes relating thereto.

The City of Toronto strongly objected to the connection proposed to be made, but as it had no locus standi, it endeavored to prevail upon the York Tp. council to appeal against the Board's order, the city to pay all costs. The council, however, after consulting its solicitor, decided that nothing could be gained by an appeal, as he expressed the opinion that it could not be successful. The council also stated its belief that the interests of Toronto would not be affected seriously by the connection.

Jitney Traffic Notes.

The Vancouver, B.C., City Council has in course of arrangement the difficulty with the jitney owners as to the bonds which will be accepted under the bylaw.

A large number of car owners in the City of Quebec operated them as jitneys, during the day on which the Quebec Ry. Light and Power Co.'s conductors and motormen went on strike, Aug. 30.

R. Robson, a jitney owner, was fined \$200 at the Provincial Police Court, Winnipeg, Sept. 5, for using his jitney as a "blind pig." Some other jitney operators are suspected of being guilty of similar practices.

During the Toronto Exhibition recently practically the whole of the licensed jitneys in the city were operating on east and west routes. Scarcely any accommodation was given north and south on Yonge St.

Electric Railway Projects, Construction, Betterments, Etc.

Brantford Municipal Ry.—A deputation of residents of Terrace Hill waited upon the Brantford Railway Commission, Sept. 20, to urge the extension of the electric railway into that section of the city. The route suggested by the deputation is as follows: Branching off at Market St. at Grey, along Grey to Clarence, under the Clarence St. subway to Dundas St. to the hill. This would give a direct line to the hill without change, and would also serve a section of the city below the hill which it is claimed would be a good revenue producer. The rails and other material taken up from the section of the old Grand Valley Ry. sold to the Lake Erie & Northern Ry. could be utilized. The commissioners assured the deputation that they would do the best possible to provide the accommodation required. The matter of the route would have to be given careful consideration. (Sept., pg. 378.)

British Columbia Electric Ry.—The Victoria, B.C., City Council, in connection with the resurfacing of Oak Bay Ave., has invited the cooperation of the company to have the entire avenue resurfaced at the same time. (Sept., pg. 378.)

Calgary Municipal Ry.—We are officially advised that it is proposed to connect the tracks over the west Centre St. bridge, Calgary, Alta., now under construction. This will involve about half a mile of construction, the material for which is on hand. T. H. McCauley is Superintendent, Calgary, Alta. (Sept., pg. 378.)

Dominion Power and Transmission Co.—We are officially advised that there is being completed about a mile of track, paving, etc., on Wentworth Ave., between Barton and Burlington Sts., on the company's Hamilton St. Ry. line.

Construction is progressing on the new steam power plant in Hamilton. (See Hamilton St. Ry., July, pg. 295.)

Guelph Radial Ry.—We are officially advised that it is expected to lay about 3,000 ft. of track on Ogilvie St., Guelph, next spring, to replace existing track. A. H. Foster is Manager; Guelph, Ont. (Nov. 1915, pg. 444.)

Hull Electric Co.—We are officially advised that the company contemplates paving its portion of Lorimer Ave., Bridge St., Montcalm St., and the Chelsea Road, in all about 10,000 ft. G. G. Gale is General Manager, Hull, Quebec. (April, pg. 156.)

Lake Erie and Northern Ry.—The Board of Railway Commissioners was reported Sept. 12, to have decided in favor of the contention of the Brantford, Ont., City Council, in respect of certain matters in dispute. The most important of these matters was the company's refusal to acquire an additional 7 ft. of available ground for the widening of Water St., adjacent to its building. (Sept., pg. 378.)

London and Port Stanley Ry.—In reference to the reported building of a second track on this line between London and Port Stanley, Ont., we are officially advised that it is not thought this work will be gone on with for some little time at least, although, from the amount of traffic the work is a necessary one. Under any circumstances it will be necessary to purchase additional rolling stock in order to handle the traffic offering, a number of steam railway passenger cars having had to be rented during the past summer. (Sept., pg. 378.)

Moncton Tramway, Electricity and Gas Co.—Negotiations are reported to be in progress between the company and the city council, for the extension of the line from the present terminus on John St., Moncton, N.B., to the corner of Wilbur and Union St. (Aug., pg. 338.)

Oshawa Ry.—Tenders are under consideration for the work and material required in the construction of a heating chamber, and for the installation of a complete steamheating system in the car barn and works shops at Oshawa, Ont. H. W. Cooper is Manager, Gananoque, Ont. (Nov. 1915, pg. 441.)

Sandwich, Windsor and Amherstburg Ry.—We are officially advised that the company has under construction 2,200 ft. of double track line on London St., west, Windsor, Ont. (July, pg. 295.)

Saskatoon Municipal Ry.—It was reported Sept. 15 that tracks for the electric railway was being laid on the new 25th St. bridge, and that the work was expected to be completed by Sept. 30. About 1,200 ft. of double track is being laid. The bridge is being built and it is expected to be opened for traffic by the end of October. (Sept., pg. 378.)

Sudbury-Copper Cliff Suburban Electric Ry.—We are officially advised that nothing definite has been decided upon as to the Murray Mine and Coniston extensions. The company is building a one mile extension in Sudbury, Ont. (Sept. pg. 378.)

Three Rivers Traction Co.—We are officially advised that the company is completing the building of an extension of its line from Three Rivers, Que., to Cap de la Madeleine. The new track is being laid with 75 lb. rail, and is expected to be ready for operation early in October. An 85 ft. extension has been completed to the car barn and shop building, doubling its car capacity.

The total length of the Cap de la Madeleine division, from the starting point at the intersection of St. Maurice and St. Cecile Sts. to Cap de la Madeleine will be 19,500 ft. The line is already built across St. Christopher Island, and the projected extension is from that point to Cap de la Madeleine. (Mar., pg. 378.)

Toronto Civic Ry.—We are officially advised that work on the Lansdowne Ave. line was completed July 20, except the diamond and interlocking installation with the Toronto Suburban Ry. at Davenport Road. Now that the change in gauge of the T. S. R. has been approved of the diamond will be put in when the latter work is undertaken.

The construction of a 9-car addition to the civic car barn, St. Clair Ave., is being built, Chalkley & Sons being the contractors. (Aug., pg. 338.)

Toronto Suburban Ry.—A Toronto press report stated recently that the company had decided, owing to the difficulty in obtaining copper for overhead work, to operate the extension from Lambton to Guelph, by steam, commencing Oct. 1. We are officially advised that nothing of the kind is contemplated. The company has not the power to operate its railway by steam, but when the right of way was purchased, a clause was inserted in the various agreements, to the effect that those selling the land would raise no objection should it be deemed desirable to operate by steam. The line between Toronto and Lambton is on the public highway and is 4 ft. 10 in. gauge, while the extension from Lambton to Guelph is on

private right of way, and is standard gauge. The Ontario Railway and Municipal Board has authorized the change of gauge to standard, on the city end, but it is not conceivable that steam operation on the public highway would be permitted.

The Western Canada Power Co., which owns the charter of the New Westminster and Boundary Ry., completed arrangements for a reorganization of its finances Sept. 1. Under the new arrangements the security of the bondholders is unimpaired, and the noteholders have provided \$100,000 of capital. Practically all of the noteholders have agreed to allow their notes to remain on deposit with the reorganization committee.

The Windsor, Essex & Lake Shore Rapid Ry. has been authorized by the Board of Railway Commissioners to build a spur for Champion Brick & Tile Co. in Gosfield North Township, Ont.

Some paving is being done by the company in Leamington and Windsor, Ont. (July, pg. 295.)

Winnipeg Electric Ry.—The Manitoba Public Utilities Commission has refused to grant a hearing to the Winnipeg City Council's application for an order to compel the company to build a temporary car line on Sargent Ave. from Arlington St. to Wall St.

We are officially advised that there is under construction by its subsidiary, the Winnipeg, Selkirk and Lake Winnipeg Ry., 1.5 miles of single track line with gravel ballast, from the city limits of Winnipeg to Kildonan Park, which will make the line a double track line. (Sept., pg. 378.)

Guelph Radial Ry., which is owned by the city of Guelph, Ont., has advanced its conductors' and motormen's wages to the following rates, per hour: 1st year, 21c; 2nd year, 22c; 3rd year, 23c. This is practically an increase of 1c an hour, except for the first three months service, which was formerly 19c and the remainder of the year 20c, the second year having been 21c and the third year 22c. The men are working 68 hours a week, six days to the week. The company supplies one new uniform a year, together with buttons and caps.

Niagara River Bridge.—A bill has been introduced in the U. S. Congress to authorize the building of a second bridge across the Niagara River at Buffalo, N.Y., to take care of pedestrian, vehicular and street railway traffic. E. C. Connette, President International Ry., Buffalo, N.Y., is interested. The bill has been introduced, it is said, following the failure of negotiations with the G.T.R. for the widening of the present International Bridge so as to take care of the general traffic.

Pennsylvania Rd.'s Detroit Extension.—President Rea of the Pennsylvania Rd., states that the announcement of the proposed extension of the Pennsylvania into Detroit, Mich., had brought out misleading conjectures as to the plans and cost. A direct connection with that city had been under consideration for some years, but the recent industrial development there has been such as to make this extension of the company's service necessary. This does not, however, mean the construction of 80 miles of new line, as has been said, nor the expenditure of \$40,000,000. The capital outlay will not exceed \$10,000,000.

Marine Department

The Dominion Government Asked to Start Ocean Steamship Building.

J. G. Scott, President, Quebec Board of Trade, and formerly General Manager, Great Northern Ry. of Canada and Quebec and Lake St. John Ry. has sent us copies of correspondence between himself and the Minister of Trade and Commerce. The first letter was written by Mr. Scott on behalf of the Board on May 17, as follows:

The Council of the Quebec Board of Trade have followed with much interest the recent debate in Parliament on the question of ship building in Canada, in which you outlined an approximate idea of a method of encouraging the building of steel ocean going steamships in Canadian shipyards and their operation by Canadian owners. We understand that your plan would be for the Government to pay as a bonus the difference between the cost of building such vessels in Canada and that of building them in shipyards in the United Kingdom, and also a guarantee of subsidy to represent the difference between the cost of navigating vessels as built by Canadian owners, as compared with the cost of navigating under British ownership. We do not know if we have correctly understood the meaning of your speech, but it would seem to us that the question is so urgent that some such policy is necessary in the interest of the country; because, at present our export trade is simply prohibited by the high rates of ocean freights. For instance, in the deal trade, which interests equally Quebec and St. John, N.B., the present rate of freight is six times what it is under normal conditions, and the freight is thus far greater than the value of the lumber.

We presume that if such a policy were to be determined upon, it could not be put into force until after next session of Parliament. And in any case, if the cost of building ocean steamers in England now is so much greater than before, as the recent debate in Ottawa would indicate, might it not be difficult to induce Canadian builders to build until the termination of the war will have given them some idea as to what conditions will prevail for the future? In the meantime, the great and rapidly increasing export trade of Canada is almost at a standstill for want of ocean tonnage. The Northwest raised last year 700,000,000 bush. of grain, Montreal exported less than 40,000,000, no less than 105,000,000 went to Buffalo and thence to United States seaports, and many million bushels of grain in the Northwest are exposed to loss or injury for want of storage. Is it not therefore most urgent that the Government should take some decided steps to remedy this alarming condition of affairs?

The Quebec Board of Trade has urged for the last three years that grain storage should be built at Quebec, Halifax and St. John for at least 10,000,000 bush. at each place, so as to fully utilize the new means of transporting western grain to the seaboard offered by the National Transcontinental Ry., and thus give constant grain traffic to the railway, which the recent declaration of the Minister of Railways proves that it can profitably carry at 3c a bush. cheaper than the rates in force on the lake and rail route.

The question of ocean tonnage seems

to be equally important. Why should we not build and own and operate our own ships, as we did 40 years ago, when Canada stood fourth on the list of ship owning nations? Today, we are nowhere. Then, the ships of Quebec, St. John, Yarmouth, Charlottetown and Halifax, manned by Canadian captains and crews, were well known in every port in the world. Our merchants were ship owners and our people were mariners, and both were drawing revenue from the greatest source of revenue, which does not appear in the Government statistics, viz., ocean freights. One firm in Quebec had, at that time, nearly 100 ships in service. All that has gone. Why should it not be revived, and why should we not build steel vessels, as we formerly built wooden ones? We are able to build costly railways, great bridges, and railway cars and to make steel rails. Why not ships?

The Government is just completing, in the port of Quebec, the largest dry dock in the world, capable of docking the greatest steamship afloat, and therefore more than large enough to secure safety and repair to the largest steamships now using the St. Lawrence, some 20 of which are now without the means of repair in case of accident, being too large for existing docks. When this dock is finished, in six months from now, it will be necessary to keep a staff of experienced shipwrights and riveters there, so as to repair vessels in case of mishap. These men must have constant employment, or they will not remain. Between this dock and the smaller Government dry dock, adjacent, there is a ship building yard, where the Davie Ship Building and Repairing Co. have in the last few years built a number of steel river steamships. The workmanship on which has been declared by experts to be as good as any done on the Clyde. They are now building a large steel train ferry steamship for British Columbia, and a fleet of launches and small craft. Some 1,800 men are thus employed, who, when the war is over, will be out of work, unless, in the meantime, some arrangements can be made for building ocean steamships.

So as to give work to these men, as well as to the steel working staff who will have to be kept at the new dock, we would respectfully suggest that the Government take the initiative in building ocean steamships in Canada, by building say six or more freight steamships of 8,000 to 10,000 tons register, of which 2 might be built at Montreal, 2 at Quebec and 2 in the Maritime Provinces, and, if thought proper, some seagoing vessels on the upper lakes, whose tonnage would of course be much smaller on account of the St. Lawrence Canal locks. An arrangement could no doubt be made with the ship building yards at these points to build these vessels at the actual cost of labor and material, plus say 10%, or any other profit that might be thought equitable. In this way, the Government would establish the cost on which to frame future legislation; would start the movement of building ocean steamships in Canada; would provide a small fleet to help out the transportation problem, which is very acute, would prevent a lot

of men being thrown out of employment when the war is over, would increase the business of our steel works, and would create a valuable industry, which could then be left to private enterprise, aided possibly by some encouragement from Parliament.

Sir George E. Foster's Reply.

The Minister of Trade and Commerce wrote Mr. Scott on May 19 as follows:

In my speech in Parliament I discussed the various methods which had been proposed or might be put forward to mitigate the present difficult conditions of ocean transport, with an endeavor to draw out from the House an expression of opinion as to the best policy to be pursued. After thoroughly considering the matter, the Government came to the conclusion that it was impossible, under present circumstances, to lay down a well considered line of policy for consideration during the session just closed. The matter has been referred to a committee of council who, during the interim, will give it more extended consideration, and, if possible, be prepared at the next session of Parliament to state their intention.

Your Board is well within the mark when they recount the present conditions and urge the necessity for supplying a remedy. The nature of the remedy that could be applied, however, is a difficult matter to decide. Granted a worldwide and increasing lack of tonnage, with almost an unprecedented quantity of products to be transported, and the consequent lack of space and advancing rates, now far away beyond the normal, the question as to how to remedy this state of affairs is not solved in any way by the statement of conditions. To cite the situation years ago when Canada stood fourth in the list of shipowning nations and the situation today, does not bring very much relief. Those were the days of wooden shipbuilding, when Canada had the advantage of most countries of the world in procuring the best of lumber and of easy access to the seaboard, where inexpensive yards and plenty of material and cheap labor created an ideal situation for shipbuilding. But of course the wooden vessel has gone and its place is now taken by steel vessels and, in the main, by steel vessels of very large carrying capacity.

If shipbuilding is to be revived, it must be in the form of steel ships and for the building of these, very expensive yards are required, skilled labor to a large extent and accessible material. At present our steel shipbuilding yards are few in number and, in the main, congested with work, whilst on the other hand, labor is scarce and the skilled portion of it largely diverted to war purposes. The steel material is at peak prices and under the present conditions requires months, if not years, before an order presently given can be filled. On the other hand, whilst at this present moment tonnage is scarce and freights are high, no one knows how soon peace may come, and when it does come no one knows just what will be the effect upon tonnage and rates.

Anyone can guess, and some people may give a studied opinion, but all are liable to contingencies. So far as en-

quiries have gone, we could not get a contract for steel ships very much less than from \$125 to \$135 a ton and nowhere in Canada could we get the steel for the building and no place in the United States, under eight or ten or more months for delivery. This brings it about that the delivery of ships built under these conditions could not be guaranteed, if orders were given at once and construction gone on with as rapidly as possible, until the middle of 1917 or later. What conditions would be met with in the ocean carrying world at that time nobody knows. If peace were to ensue the interned tonnage turned loose and the necessities of army convoys and munition and supply carrying were done away with, the builder of these ships, be it Government or individual, would find himself with the most costly construction thrown into competition with the released tonnage of the world, and a corporation, and still less a Government, does not wish to face that contingency.

These are some few of the considerations hurriedly thrown together which have to be taken into account in framing a policy for shipbuilding. Coincident with that is one of the most pressing of all conditions, the exceedingly large contributions that must be taken from the country in capital and taxes to sustain the burdens of the war, which are now costing us nearly \$20,000,000 per month. There is a limit to the provision of funds by the methods of taxation; there is also a limit to the borrowing possibilities even of Canada, shut out as it now is practically from every European market.

Please do not consider that, although sending this, I do not sympathise, and very strongly sympathise, with the considerations you have put forth. It is a difficult matter for a Government, as you will quite see, and the best I can say is that they are now giving and will continue to give it their very best consideration.

The Quebec Board of Trade's Answer.

Sir George Foster's letter having been considered by the Quebec Board of Trade, Mr. Scott wrote Sir George Foster on June 19, to London, England, as follows: We still think that it would be wise for the Government to take the initiative and build six or more commercial steamships of 8,000 to 10,000 tons each, say, two at Montreal, two at Quebec, and two in the Maritime Provinces, on the basis of the cost of labor and material plus a reasonable percentage for the builder. By doing this, they would introduce an element of competition and at same time establish a basis of cost to guide them in the legislation necessary to establish this most important industry.

We respectfully suggest that it is the government which should incur the risk of building at the present moment, when, as you say, there is uncertainty as to the conditions which will prevail after the war is over. Private capital, as you know, is proverbially timid, and will not take risks until things have settled down. In the meantime, the country is crying out for relief in the way of shipping. Three-fourths of our western grain—the beneficial result of our enormous sacrifices in building three trans-continental railways—was diverted last year to Buffalo and New York because we had insufficient grain storage and ocean tonnage at our seaports. This must be remedied, or the commercial interests which hold together our disjoint-

ed provinces will soon cease to exist.

From a local point of view, what are we going to do after the war is over, with the 6,000 men who are now employed in Quebec in building small war vessels and in making rifles and ammunition, unless some such employment is available?

Building these vessels would not be money thrown away. The government would soon have good value for it, in the ships themselves, which should not cost dearer than those now building in the United States, and probably very little dearer than those building in Great Britain. And in doing this, they would give employment to our own people at a critical time, and help to provide tonnage to stop the alarming diversion of our trade from our seaports.

I enclose a clipping from the New York Herald which shows that the United States shipyards have now on the stocks 368 steel steamships, aggregating more than one million tons, and that there are more than twice the number of ships carrying the Stars and Stripes than there were before the war. If they can do this, with wages for shipwrights in their yards as high as 75c an hour, surely we can do much better, with more moderate scale of wages prevailing in Canada.

In my previous letter I omitted to point out that if building commercial steamers would lead to the building of war vessels, as it probably would, even though we are and hope always to be a peaceful people, there could be no better or safer place for a naval construction yard than the port of Quebec—because it is remote from the frontier, and not exposed to raids or incursions which might destroy vessels building in Montreal, only an hour's run from the border. It is also safe from attack by sea, being nearly 800 miles from the Atlantic, and only accessible through a channel which for many miles is narrow and could be commanded by artillery from both shores of the St. Lawrence, and is, therefore, not so liable to attack by sea as Halifax, St. John, or Sydney would be. Ships under construction in the yards here would be under the protection of the guns of the Citadel. Ships built in the yards adjoining the new graving dock here could be launched or docked in winter, almost as well as in summer, as the river at this point is always open and free from floating ice.

The transportation of steel and coal for these shipyards, from Sydney or New Glasgow, to Quebec, Montreal, Halifax or St. John, need not be considered an obstacle, because it would not cost more than the freight on similar articles from Glasgow to Belfast where the largest shipyards in the world are in successful operation and not much more than the cost of moving these materials from the steel works to the shipyards at Sydney, itself.

For all these reasons, I do hope you will advise the government to respond to the wish of the people and take immediate action in the direction of building ocean steamers in Canada.

The Nova Scotia Steel Co.'s President's Views.

Thos. Cantley, President, Nova Scotia Steel and Coal Co., wrote Mr. Scott recently, as follows:—The completion of the new Quebec graving dock, and the natural and other facilities already existing at your port, would certainly warrant you in assuming that steel shipbuilding, whether mercantile or naval, could be carried out as well at Quebec as

at probably any other port in Canada. Not only, as you point out, would the cost of transporting material from New Glasgow or Sydney to Quebec, be as cheap or from Glasgow or Middlesbrough to Belfast, but as a matter of fact, experience in years past has proved that iron and steel products such as angles, plates, etc., have, and can again be delivered from Glasgow or Middlesbrough to Belfast. This, of course, is due to the fact that domestic railway and coasting rates in the United Kingdom are exceedingly high, while ocean freights to Canadian Atlantic ports are practically on a ballast basis.

Norwegian Vessels to Be Built in Toronto.—An order has been placed with Polson Iron Works Ltd., Toronto, by Hannevig and Johnsen, New York, on behalf of Norwegian parties, for the construction of two steel cargo single screw steamships, for early delivery. They will be of the Frederickstadt type to Bureau Veritas classification, common to the Norwegian trade, with propelling machinery placed amidships. The dimensions will be, length between perpendiculars 251 ft., length over all 261 ft., breadth moulded 43½ ft., depth moulded 22 ft. 11½ ins., and they will be equipped with triple expansion engines with cylinders 20½, 33 and 54 ins. diam., by 36 ins. stroke, 1,300 i.h.p. at 80 r.p.m., and supplied with steam by boilers 14 ft. diam. by 12 ft. long, at 180 lbs. They will also be equipped with 6 cargo winches and the usual pumps and auxiliary apparatus, as well as complete electric lighting plant. The deadweight capacity of each will be about 3,500 tons on 19½ ft. draught.

The Canadian Northern Ry. is building 2 car floats at Port Mann, B.C., for conveying freight cars across Patricia Bay, until the large car ferry which it has decided to build, is ready for service. They were designed by A. Angstrom, Naval Architect, C.N.R., Toronto, and will be 158 ft. long over all, 46 ft. beam over plating, and 48 ft. over wales, and 11½ ft. deep. They will each take 8 large size freight cars. The first one was launched in July. The C.N.R. has bought two whaling steamships, the s.s. Germania and a sister vessel, formerly owned by Canadian Northern Pacific Fisheries, Ltd., which are being changed to make them suitable for towing purposes, and which are to be renamed Chilliwack and Sumas.

Caution to Navigators near Pierre, Miquelon.—The Marine Department has been notified that during August, five vessels were wrecked near Plate Point, Little Miquelon, all during foggy weather. As all of these vessels went ashore at practically the same point, and as others have been wrecked there in the past, it seems probable that there is a definite cause, possibly a current, to which these accidents can be attributed. Until further information is available, mariners should be extremely cautious in this vicinity, especially during foggy weather.

The World's Increased Vessel Tonnage. A press dispatch of Aug. 28, purports to give the decreases and increases of vessel tonnage of the various belligerent and neutral countries for the previous 12 months, and shows a net decrease in tonnage of 1,084,749 tons. Increases shown by Russia, Italy and Norway totalled 223,885 tons, while the other countries showed decreases, the greatest decrease being Germany, 326,946 tons. Great Britain's tonnage decreased 367,037 tons.

Atlantic and Pacific Ocean Marine.

The Harrison Line s.s. Counsellor, bound from Vancouver, B.C., for Liverpool, Eng., is reported to have been sunk, the crew being saved.

Furness Withy and Co. are reported to have placed orders for the building of an additional four steamships. The British Government has also arranged for this company to operate the interned German steamships which Portugal has handed over to the British Government.

The Belgian s.s. Indutimare, which was wrecked on Magdalen Island, Aug. 21, and abandoned, has been salvaged and taken to Port Mulgrave, N.S., with comparatively little damage. She was picked up by the tug Amelia, after having drifted clear of the rocks. She sailed from Newcastle, N.B., Aug. 18, for Calais, France, with lumber. This vessel was listed in England as a total loss.

Maritime Provinces and Newfoundland.

The Public Works Department will receive tenders to Oct. 10 for the construction of a wharf, warehouse and shed, at Gagetown, N.B.

A press report states that the car ferry service between Carleton Point, P.E.I., and Cape Tormentine, N.B., will be put in operation Nov. 1.

A four masted schooner, named Ada Tower, was launched at Port Grenville, N.B., Sept. 2. She is 150 ft. long and 528 register tons, and is to be used in the coast lumber trade.

The s.s. White Sea, outward bound from Three Rivers, Que., with a cargo of lumber, went ashore near St. Peters River, Nfld., towards the end of August, and became a total loss.

The Reid Newfoundland Co.'s s.s. Argyle collided with and sank the s.s. Hump off the entrance to St. Lawrence harbor, Nfld., towards the end of August. The Hump's crew were saved. She was operated on the Fortune Bay service, and had just been overhauled at St. John's.

The Department of Naval Service received recently bids for the purchase of the three masted schooner Burleigh, but as none of them approximated a fair value for the vessel, all were rejected. Halifax interests urged on the Department that in view of the shortage of tonnage at present, she be offered for sale, with the foregoing result.

A Government wharf has been completed at Shelburne, N.S., with 30 ft. of water at its outer end. The wharf extends from the south extremity of the point south of the town, as an earth embankment, for 425 ft., beyond which it is pile work 500 ft. long. The outermost 100 ft. is 80 ft. wide, and the remainder 40 ft. wide. There are two lines of railway track and a freight shed on the outer block, and the whole is lighted by electricity.

A motor vessel is reported to be under construction in Great Britain for use in the Newfoundland fisheries trade. It is of composite construction, 160 ft. long, and equipped with two engines of the 2 cycle polar type, each developing about 350 b.h.p., and a speed of over 13 knots an hour. It is stated that if this vessel is successful, a number will be built and equipped with engines developing about 1,000 h.p. and a speed of 15 knots an hour.

The St. Peters canal, connecting Bras d'Or Lakes with the Strait of Canso, has been reopened after having been closed for over a year pending enlargement and general improvement. It was first opened in 1865, and has been in operation since then without changes. The lock has been lengthened about 250 ft. and a curve has been practically eliminated. The entrance at the south end has been enlarged, and the canal is now available for vessels drawing 17 ft.

A press report states that the Dominion Government has purchased two steamships, the Manhattan and Narragansett, from the Central Vermont Transportation Co., for \$1,000,000. There is no confirmation of this, and the report should not be taken seriously. These vessels were built for operation between New York and Providence, on the completion of the Southern New England Ry. line from Palmer, Mass., to Providence, R.I., which has been delayed. The question of the operation of these vessels with others of the same company was before the Interstate Commerce Commission recently, under the Panama Canal Act, and the permission to operate was granted. All the companies named are subsidiary to the G.T.R.

Province of Quebec Marine.

The J. G. Rene Transportation Co. Ltd. has been incorporated under the Quebec Companies Act, with authorized capital of \$20,000 and office at Montreal, to carry goods by all means of transportation, and

in connection therewith to own and operate all kinds of boats and vehicles, with or without motive power, on land or sea. J. G. Rene, Y. Dupre, L. Gelinas, H. Bourassa and L. Gauvin, Montreal, are the incorporators.

Ontario and the Great Lakes.

Northern Navigation Co. employees have contributed \$50 to the Port Arthur Red Cross Fund.

The Department of Public Works received tenders to Sept. 22 for the construction of an extension to the west breakwater at Port Stanley.

The Farrar Transportation Co. Ltd., Toronto, has been authorized to increase its capital stock from \$250,000 to \$1,000,000, by the creation of 7,500 shares of new stock of \$100 each.

The Canada Shipping Co.'s s.s. John B. Ketchum 2d, was damaged, Sept. 12, in collision with Wilson Paterson Co.'s s.s. Senator Derbyshire, while entering the harbor at Port Colborne.

A vessel has been completed at East Trenton, for navigation on the Trent Valley canal. The propelling power consists of two 20 h.p. gasoline engines driving twin propellers.

The Dominion Government dock at Windsor is reported to have been leased to the Detroit and Cleveland Navigation Co., for the winter, for the berthing of a number of the company's vessels.

The steam tug Thomas Freel Battle, owned by J. Battle, St. Catharines, which was sunk in the Detroit River, near Walkerville, some time ago, has been raised and taken to Sarnia for repairs.

The Mathews Steamship Co.'s s.s. Masaba grounded on Grassy Shoal, Lake Superior, Sept. 3, and was floated Sept. 6 and taken to Port Arthur for repairs. It is stated that 28 plates in the bottom of the hull were damaged.

The steamboats Agwinde and Keenora, formerly owned by the Rainy River Navigation Co., Fort William, are now owned by the Rat Portage Lumber Co., and are lying at Kenora on Lake of the Woods. They have not been operated this year.

The Northern Navigation Co.'s s.s. Saronic, which was burnt at Cockburn Island, Georgian Bay, Aug. 21, is reported to have been sold to W. Schlosser, Milwaukee, Wis., and it is said that the wreck will be towed there and rebuilt.

The Imperial Oil Co.'s s.s. Iocolite, which has been built at Collingwood,

List of Steam Vessels Registered in Canada During August, 1916.

No.	Name	Port of Registry	Where and When Built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner	
124262	A. Tremblay...	Quebec, Que.....	Matane, Que.	1916	111 5	28 2	10 4	245	147	24 sc.	U. Tremblay, et al. Matane, Que.
124445	C. A. Jaques...	Montreal.	Dumbarton, Scotland	1909	249 0	43 0	22 7	2105	1590	212 sc.	Canada Steamship Lines, Ltd., Montreal
128204	Coaster	Vancouver, B.C.	N. Westminster, B.C.	1916	94 0	21 0	7 2	149	99	10 sc.	Coast Steamship Co., Vancouver, B.C.
128227	J. D. Hazen...	Montreal	Montreal	1916	275 0	57 8	21 9	3269	1856	568 sc.	Canadian Vickers Ltd., Montreal, Que.
194279	Turret Crown	Vancouver, B.C.	Sunderland, England	1895	253 0	44 0	19 4	1827	1142	250 sc.	Coastwise Steamship & Barge Co. Ltd., Vancouver

List of Sailing Vessels and Barges Registered in Canada During August, 1916.

No.	Name	Port of Registry	Rig	Where and When Built	Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner	
124271	Agnes P. Duff.	Lunenburg, N.S.	Schr.	Conquerall Banks.	1916	106 2	27 6	10 2	178	W. Duff, et al., Lunenburg, N.S.
124272	*Alluvia.	New Westminster, B.C.	Barge	New Westminster.	1911	100 0	23 3	5 0	263	Coast Steamship Co., Vancouver, B.C.
124273	Hillcrest.	Lunenburg, N.S.	Schr.	Lunenburg, N.S.	1916	132 6	32 5	11 8	299	Hillcrest Shipping Co., Lunenburg, N.S.
124274	Ind. Asphalt No. 2.	Prince Rupert, B.C.	Scow	Port Orchard, Wash.	1907	100 7	31 9	10 0	273	Coastwise Steamship & Barge Co., Vancouver
124275	K. N. No. 2.	Vancouver, B.C.		New Westminster.	1915	84 3	32 0	8 4	474	Kingcome Navigation Co., Vancouver
124276	M. H. P. No. 1.	New Westminster, B.C.	Barge	"	1913	100 0	33 0	8 6	261	Marsh, Hutton, Powers Co., New Westminster
124277	No. 2.	"	"	"	1913	100 0	33 0	8 6	261	"

*Formerly a steamer.

sailed from there, Sept. 16, for Sarnia, on her maiden trip. This is the second of three vessels being built at Collingwood for the company. The third will be launched shortly.

The Marine Department is building a new lighthouse on Burnt Island in the Thousand Island district of the St. Lawrence River. It replaces a former gas beacon on the east side of the island, and consists of a rectangular wooden building, with a light of the dioptric type at an elevation of 64 ft., visible for five miles.

The Keystone Transportation Co.'s s.s. Keybell, which ran aground at Mrgan's Point, near Port Colborne, during a heavy fog, Sept. 7, while bound to Montreal with coal, was released Sept. 10 after having had her cargo lightered. Practically no damage was sustained, and after reloading her cargo she proceeded to her destination.

The Dominion Government has awarded contracts for harbor improvements at Port Stanley, which will cost in excess of \$100,000. As the present west pier protecting the ferry slip docks threatens to collapse, and the need is very urgent, work will be undertaken at once, and will be carried on through the winter as far as weather conditions permit.

The United States Lake Survey reports the levels on the Great Lakes in feet above mean sea level, for August, as follows: Superior 603.73; Michigan and Huron 581.04; Erie 572.80, Ontario 247.36. Compared with the average August levels for the past ten years, Superior was 1.16 above, Michigan and Huron 0.21 ft. above, Erie 0.20 ft. above, and Ontario 0.87 ft. above.

The s.s. Topeka, which was sunk by the s.s. Christopher, Aug. 15, in the Detroit River, near Sandwich, lies in about 30 ft. of water about 800 ft. from, and abreast of the lower end of the Mullen coal dock at Sandwich. The spars and cabin of the wreck are showing above water, and it is lighted at night by two white lanterns. It constitutes a menace to navigation, but there is ample room for passing vessels.

The Dominion Government hydrographic survey steamship, La Canadienne, was driven ashore at Dorion, Lake Superior, Sept. 17. Considerable bottom damage was sustained, but it is anticipated that she will be salvaged. She was built at Glasgow, Scotland in 1880, and was screw driven by engine of 60 n.h.p. Her dimensions are, length 154.3 ft., breadth 22.7 ft., depth 10.9 ft., tonnage 372 gross, 227 register.

The U. S. Federal Court at Chicago, Ill., which issued a temporary restraining order to prevent the contemplated sale of nine steamships owned by the Great Lakes and St. Lawrence Transportation Co., to the French Government, has permanently enjoined the company from so selling its vessels. The Scranton Coal Co. stated that it had a three year contract with the company for the transportation of coal from Oswego, N.Y., to Milwaukee and Chicago, and that the company had not only stopped taking the coal, but had sent its vessels to Montreal preparatory to completing the sale to the French Government. It was held that the company is bound by the contract to carry the coal regularly for three years.

The ice breaking ferry steamboat, St. Ignace, owned by James Whalen, Port Arthur, and registered in the U. S., was destroyed by fire, Aug. 30, while in the dry dock for repairs. She was built at Detroit, Mich., in 1888, and was of oak with diagonal strapping on the frames,

and with bottom sheathed with iron for winter service. Her dimensions were, length 215 ft., breadth 52 ft., depth 16 ft., tonnage 1,199 gross, 600 register, and she was equipped with fore and aft compound engine with cylinders 28½ and 53 ins. diam., by 48 ins. stroke, 855 i.h.p. at 85 r.p.m., and supplied with steam by 3 Scotch boilers 11½ by 18 ft. at 127 lbs. She was run for many years in the Straits of Mackinac, and was occasionally used in opening the St. Marys River above Sault Ste. Marie.

The Davidson and Smith Elevator Co., Fort William, is arranging to purchase the s.s. Caledonia from the Massey Steamship Co., Duluth, Minn., to replace the s.s. Panther, recently purchased from the same company, and which was lost in collision with the Pittsburg Steamship Co.'s s.s. James J. Hill a few weeks ago. The Caledonia was built at Marine City, Mich., in 1888, and originally named W. B. Morley. She is of oak with diagonal strapping on frames, and wooden boiler house, and is equipped with fore and aft compound engines with cylinders 24 and 44 ins. diam., by 42 ins. stroke, supplied with steam by two Scotch boilers 10 by 11 ft., under induced draught, at 180 lbs. Her dimensions are, length 277 ft., breadth 42 ft., depth 21 ft.; tonnage, 2,197 gross, 1,509 register.

Manitoba, Saskatchewan and Alberta.

The s.s. Goldfield, registered as owned by the Phoenix Brick, Tile and Lumber Co., Ltd., Winnipeg, was offered for sale by public auction at Winnipeg, Sept. 16, under a mortgage deed, subject to a reserve. She was built at Selkirk, Man., in 1912, and was screw driven by engine of 13 n.h.p. Her dimensions are, length 75.4 ft., breadth 15.9 ft., depth 6 ft., tonnage, 56 gross, 38 register.

British Columbia and Pacific Coast.

The Western Shipping Co., Vancouver, is reported to have purchased the s.s. British Columbia from H. F. Bullen, Victoria, for \$95,000, for operation to Vladivostok, Russia.

The Border Line Transportation Co. has increased its service to British Columbia ports, the vessels Edith, Fulton, and Wakena, calling at Victoria, Vancouver and Powell River, as well as other ports, every three days.

Navigation on the upper Yukon River is practically closed for the year. The last steamboat left Dawson for Fairbanks Sept. 24, and the last boat from Dawson for White Horse is scheduled to sail Oct. 10.

The Canadian Fishing Co., Vancouver, has purchased the steamships Canada and Imbricaria from the liquidator of the British Columbian Fisheries, Ltd., for the halibut fishery trade. They have been removed from Skidegate Inlet to Vancouver, where they are to be overhauled and remodelled.

The C.P.R. s.s. Princess Maquinna, was hauled out at Victoria, early in September for survey, after touching bottom on an outlying reef off Bowen Island. While she is laid up, a number of minor repairs will be carried out. The s.s. Princess May has taken her place on the Vancouver-Granby run temporarily.

The s.s. Queen City, formerly owned by the C.P.R., which was burned recently at Victoria, is in the hands of the underwriters for disposal. She was built at

Vancouver in 1894, and was screw driven by engine of 34 n.h.p. Her dimensions were, length 116 ft., breadth 27 ft., depth 10 ft., tonnage 391 gross, 244 register.

The Marine Department's buildings on the Songhees Indian Reserve at Victoria have been completed, and the department was expected to take them over from the contractors, Parfitt Bros., during September. The wharf and store shed were completed and taken over some time ago, and the finishing of the buoy and carpenter shops completes the contract.

The Ship Drummur Co., Ltd., is being voluntarily wound up. The Drummur was one of the best known sailing vessels on the coast, and was of the four masted type with iron hull, and 1,844 register tons. She was built at Liverpool, Eng., in 1882. Soon after the declaration of war in 1914, when a number of German vessels were running riot in the Pacific Ocean, she was sunk by the cruiser Leipzig.

The Grand Trunk Pacific Coast Steamship Co.'s schedule from Oct. 16 to Dec. 21 covers the operation of the steamships Prince George and Prince Rupert on the Seattle, Victoria, Vancouver, Ocean Falls, Prince Rupert, Anyox and Alaska route, and the Prince John on the Vancouver, Surf Inlet, Prince Rupert, Queen Charlotte Islands, Anyox, Alice Arm and Stewart service. On the arrival of the Prince John at Prince Rupert, Dec. 29, she will remain at that port to take up the Alaska route from Jan. 3, 1917. The service first mentioned above will be taken from Dec. 25 to March 28, 1917, by the steamships Prince George and Chelohsin or Venture, and the Prince John fortnightly from Jan. 3. The s.s. Prince Rupert will be berthed for the remainder of the winter on the completion of the trip from Vancouver, Dec. 21. The s.s. Prince John will also perform the service from Prince Rupert to Queen Charlotte Islands, Anyox, Alice Arm and Stewart, alternately with the Alaska service, from Jan. 10.

Canadian Vickers, Ltd., placed on the market recently at par, an issue of £1,000,000 6% first mortgage registered debentures, redeemable at 103 in 25 years by means of a half yearly cumulative sinking fund of 2% per annum, all unconditionally guaranteed as to principal, interest, sinking fund and premium, by Vickers, Ltd. The sinking fund will be applied half yearly in redeeming debentures in the market at not more than 103, or by drawings at 103, the first redemption to take place by Aug. 1, 1917. The company may redeem at 103 on any interest date after Feb. 1, 1921, in whole or in part, on six months notice. Any debentures not redeemed by Aug. 1, 1941, will be payable at 103, or on the security becoming enforceable. The issue was considerably oversubscribed.

Failure to Sound Fog Horns.—Masters of vessels have made complaint through the Dominion Marine Association, as to the failure on the part of certain light keepers at the east end of Lake Ontario, to sound their horns. The Marine Department has taken the matter up and has notified the light keepers that further default will be considered serious.

Furness, Withy & Co., by the acquirement of the Prince Line, Ltd., and its 42 steamships, are now said to control the largest cargo and cargo liner fleet in the world, the dead weight capacity being estimated at from 1,250,000 to 1,500,000 tons.

Mainly About Marine People.

N. A. Rule, heretofore Assistant to Operating Manager, Canada Steamship Lines, Ltd., Toronto, has been appointed Secretary, Standard Shipping Co., Winnipeg.

P. S. Laing, heretofore agent, F. Waterhouse & Co., steamship managers, at Vancouver, B.C., has been appointed General Freight Agent, same company, at Seattle, Wash.

R. M. Pedgen, of Toronto, who was second officer on the Canada Steamship Lines s.s. Chippewa, prior to enlisting in 1914, is in a hospital in France suffering from a fracture. He was previously wounded in April by shrapnel.

Col. G. P. Murphy, Vice President, Ottawa Transportation Co., who is in the Canadian Army Service Corps, and who has been in England for some time, has been appointed Quartermaster General and graded as a General Staff Officer, First Grade.

Capt. F. L. Davison, formerly master of the C.P.R. Company's s.s. Monteaule, and latterly master of the s.s. Empress of Japan, has been appointed Assistant Marine Superintendent, Canadian Pacific Ocean Services, Ltd., Vancouver.

J. B. Morris, heretofore chief engineer, Great Northern Pacific Steamship Co.'s s.s. Great Northern, has been appointed Marine Superintendent for the company at Portland, Ore., vice C. W. Wiley. He has specialized in the operation of the steam turbine.

W. S. Baker, who died in August as the result of wounds received in France, was the second son of W. Baker, Travelling Representative of the White Star-Dominion, and American Lines, and was himself, about four years ago, acting as Canadian conductor to parties travelling

in the Dominion, on behalf of the White Star-Dominion Line.

Capt Gow, heretofore Marine Superintendent, Dollar Steamship Co., has not, we are officially advised, been appointed Superintendent of Loading, Canadian Pacific Ocean Services, Ltd., Vancouver, B.C., as reported. He is now reported to have been appointed Marine Superintendent, Canada West Coast Navigation Co., which is having a number of auxiliary power sailing vessels built for the coast lumber trade.

Stranding of the s.s. Fernfield.

An investigation into the stranding of the British s.s. Fernfield, on Battery Point, Louisburg, N.S., July 4, was held at Halifax, recently, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Commander E. Wyatt, R.N.R., and Capt. A. Cuthbert, as nautical assessors. From the evidence adduced the court found that from the time the vessel left St. John, N.B., on July 1, until it reached Louisburg light, the master exercised all the necessary and proper precautions in navigating, but in that neighborhood, under the weather conditions existing, he omitted to include in his calculations the possible influence of wind on his starboard, in heading for the light on the wharf, and also that in turning around close to the buoy, a mistake was made. It therefore found that he erred in judgment, but not in a culpable manner, and therefore did not deal with his certificate, nor reprimand him, but cautioned him to be more careful in the future, in entering harbors with which he is not well acquainted. The logs were examined and found properly kept and supervised.

Canada Steamship Lines Notes.

J. A. Greiner has been appointed Mechanical Superintendent, vice R. Duguid resigned. Office, Montreal.

The Northern Navigation Co. during the past navigation season provided a hostess on each of its five principal passenger steamships to receive passengers and to help in making the trips enjoyable.

N. A. Rule, Assistant to the Operating Manager, having resigned to become secretary of the Standard Supply Co., Winnipeg, his former position has been temporarily abolished, and A. E. Stinson has been appointed acting dispatcher, Toronto. He was entertained to lunch at Toronto, Sept. 9, by his associates, and presented with a gold fountain pen.

In our last issue a paragraph relating to the sinking of the s.s. Topeka by the s.s. Christopher in the Detroit River, near Sandwich, Ont., was placed among other paragraphs under this heading, owing to a mistake in "making up." Neither of the vessels mentioned is owned by Canada Steamship Lines, Ltd.

A dividend of 1 3/4% has been declared on the preferred stock, payable Nov. 1 to holders of record on Oct. 2. There are still some arrears of dividend due, approximating 10 1/2%, and press reports state that it is probable that early in the new year a payment of about 7% will be made on this account.

The s.s. W. C. Moreland, which is being rebuilt at Superior, Wis., will, when completed, be renamed Sir Trevor Dawson, and operated by the American Interlake Line, a subsidiary of Canada Steamship Lines Ltd. She will be retained on the U. S. register. A preliminary description of the rebuilding work was given in our last issue, page 384.

It is announced that the voting trust which was organized on the consolidation of the various companies forming Canada Steamship Lines Ltd., and which was to expire in 1919, has been extended for a further 10 years. It has been thought prudent by the British and Canadian interests at present in control to ensure the perpetuation of the present management for that time.

The Hamilton Shipbuilding and Ferry Co., a subsidiary of Canada Steamship Lines, operating the ferry service out of Hamilton, has applied to the Hamilton City Council, for an extension of its lease of Wabasso Park, where it proposes undertaking a number of improvements to the amusement section, as well as to the general ferry service. It is stated that the company may also build a dry dock at Hamilton. The company was incorporated under the Ontario Companies Act in May, with an authorized capital of \$100,000, and office at Hamilton, and J. G. Gauld as President.

The American Association of Port Authorities held its annual meeting at Montreal, Sept. 15, when papers were read and other matters concerning the administration of ports were discussed. W. G. Ross, Chairman, Montreal Harbor Commissioners, was re-elected President for the current year. The delegates attending the meetings were entertained by the Shipping Federation of Canada, and the Montreal Harbor Commissioners.

A concrete ship has been built at Christianiafjord, Norway, recently. Apart from the ribs, the hull is entirely of concrete. This combination will, it is said, resist damage better than steel or wood.

Grain in Store at Terminal Elevators, Interior Terminal Elevators and at Public Elevators in the East.

Week ending Sept. 8, 1916.	Wheat. bushels.	Oats. bushels.	Barley. bushels.	Flax bushels.	Totals. bushels.
Fort William—					
C.P.R.	621,436	594,624	39,012		1,255,072
Consolidated Elevator Co.	316,464	148,983	14,008	99,099	1,579,364
Empire Elevator Co.	244,267	163,800	27,892	182,223	1,618,182
Ogilvie Flour Mills Co.	726,405	98,804	21,200		1,846,409
Western Terminal Elevator Co.	374,699	163,914	5,277	277,709	1,821,599
G. T. Pacific	386,578	268,000	22,380	73,061	1,750,019
Grain Growers' Grain Co.	242,642	196,359	15,669		1,454,670
Fort William Elevator Co.	157,012	141,209	7,771	58,364	1,354,366
Eastern Terminal Elevator Co.	256,856	231,828	7,825		496,509
Port Arthur—					
Port Arthur Elevator Co.	1,096,627	938,078	102,300	122,015	2,259,020
D. Horn & Co.	141,108	98,002	48,122	94,474	381,706
Dominion Government elevator	286,957	270,674	11,362	89,971	2,658,964
Grain afloat	185,348	174,911	6,322	65,587	
Total terminal elevators	5,036,399	3,489,186	329,140	1,063,313	9,918,038
Calgary Dom. Govt. Elev.	9,853	9,235	121		19,088
Saskatoon Dom. Govt. Elev.	94,087	31,486	1,861	12,462	139,896
Moose Jaw Dom. Govt. Elev.	264,475	25,288	9,933	12,91	302,612
Total interior terminal elevators	368,415	66,009	11,794	15,378	461,596
Depot Harbor—	202,043				202,043
Midland—					
Aberdeen Elevator Co.	686,906	213,190			900,096
Midland Elevator Co.	105,760	493,858			599,618
Tiffin, G.T.P.	1,138,474	1,290,391			2,428,865
Port McNicol	2,018,046	899,714	319,208		3,334,166
Goderich Elevator and Transit Co.	443,535	274,295	49,640	34,198	767,470
Kingston—					
Montreal Transportation Co.	6,800				6,800
Commercial Elevator Co.	6,502	34,874			41,376
Port Colborne	1,126,752	878,503		5,800	2,011,055
Prescott					
Montreal—					
Harbor Commissioners no. 1	245,830	1,673,768	210,440		2,130,001
Harbor Commissioners no. 2	711,055	1,222,802	132,638		2,066,745
Montreal Warehousing Co.	375,907	481,429	61,655	19,113	918,991
Quebec Harbor Commissioners	488,417	263,792	19,365		771,574
West St. John, N.B.	50,829		3,341		54,170
Halifax, N.S.					
Total public elevators	7,670,056	7,726,616	796,300	39,998	16,232,970
Total quantity in store	13,074,870	11,281,811	1,137,234	1,118,689	26,612,604

Canadian Lake Protective Association.

Casualties to vessels enrolled in the Canadian Lake Protective Association, during 1915, all more or less of a minor nature, have been dealt with at various meetings of the committee this year. One of the casualties dealt with, revived the discussion of the danger arising when a signal from the bridge to the engine room is misunderstood and simply repeated. The second and subsequent signals are often interpreted in the engine room as a demand for the same action the engineer has taken after the first signal. It is urged by experienced masters that in every case where it is apparent that a signal has been misunderstood, the officer on the bridge should at once signal an alarm by a rapid movement and ringing of the Chadburn apparatus, and then repeat the correct signal. The mistake will then be noticed and corrected promptly, and when the vessel is in close quarters, much damage may be avoided.

In one of the cases of grounding, it was made clear that no vessel under the conditions then existing should attempt to enter Harbor Beach, Lake Huron, if drawing more than 16 or 17 ft. The Lake Carriers Association has been asked to make some effort with a view to having the U.S. authorities improve the harbor so that it may be available as a refuge at all times. The association's committee decided to take no further action for the time being with reference to the proposed double courses, east and west of Caribou Island in Lake Superior, as opinion generally was against the proposal.

In view of the risk of damage and delay from fire as exemplified in one of the casualties, the committee resolved that smoking be prohibited in the sleeping quarters of all vessels, and instructions were given accordingly to all members to instruct masters to see that the rule is strictly observed.

The recommendation of the Great Lakes Protective Association that no vessel should attempt to pass another in the shallow and narrow channels between the lower end of Port Huron middle ground and the Corisca Shoals lightship, and between the upper end of Russell Island

and the lower end of St. Clair Flats canal, was adopted.

Attention may be called to the very good record of the vessels enrolled in the association. In a total of 116 accidents for the first half of this year, only 6 affected vessels in the association.

The Quebec Shipbuilding and Repair Co. Ltd., which was incorporated recently with office at Montreal, has an authorized capital of \$40,000. It has leased the dock at the Island of Orleans from Le Chantier Maritime de St. Laurent Ltee., with the intention of building wooden schooners there. The company's officers are, James Playfair, Midland, Ont., President; R. A. Carter, Montreal, Vice President and Managing Director; M. P. Connolly, Quebec, Que., Second Vice President; and G. A. Wood, Montreal, Secretary-Treasurer; James Playfair is President and Managing Director, Great Lakes Transportation Co., and was formerly connected with a number of navigation companies, now concentrated in Canada Steamship Lines Ltd.; R. A. Carter and G. A. Wood are insurance brokers in Montreal, the former having been at one time in the Richelieu and Ontario Navigation Co.'s service; and M. P. Connolly is Canada Steamship Lines' agent at Quebec. In addition to these, E. S. Farley, a yacht broker, Chicago, Ill., is a director.

Suggested Car Ferry Service for the North Sea.—The Swedish State Railways management is making enquiries regarding the possibility of establishing a daily ferry service across the North Sea, between Gothenburg, Sweden, and some port in England. Ferries with a displacement of about 11,000 tons are suggested, of which four would be required for service and an additional one for reserve. The distance would approximate 500 miles. It is highly improbable that any negotiations will be carried on seriously while the war continues.

The International Joint Waterways Commission held a meeting at Ogdensburg, N.Y., at the end of August for further discussing the pollution of boundary waters, evidence being taken with special reference to the pollution in the Thousand Island district.

Quebec Transportation and Forwarding Co. Changes Ownership.

The Quebec Transportation and Forwarding Co. has passed from the control of the original directorate to one representing United States interests, and is being managed by the Canada Shipping Co., Ltd., Montreal. The Quebec Company was originally incorporated under the Dominion Companies Act, April 2, 1906, with an authorized capital of \$145,000, and office at Quebec, Que. The company was practically a close corporation, the directorate being J. S. Thom, President; M. J. Hackett, Vice President; W. J. Hackett, Manager, and L. Thom. The company owns three steam tugs, Florence, J. H. Hackett and Margaret Hackett, and five barges, A. D., F. D. Ewen, Gladys H., Katie H., and Zapotec. The new officers of the company are: T. Dougherty, New York, President; F. A. Augsbury, Pyrites, N.Y., Vice President, and G. J. Madden, Montreal, Secretary and Manager.

The Canada Shipping Co., Ltd., was incorporated under the Dominion Companies Act Feb. 24, 1910, with an authorized capital of \$20,000 and office at Montreal. H. Munderloh, Montreal was chiefly concerned in the business, which was chiefly a commission and chartering one. He sold his interests in 1915 to T. Dougherty & Co., New York, who operate in conjunction with Duthie and Madden, Montreal. The company owns the s.s. John B. Ketchum 2nd, originally owned by the Spokane Steamship Co., Port Huron, Mich., and during this year also operated the steamships Cabotia, Comp-ton and Robert R. Rhodes. The officials are, T. Dougherty, President; W. N. Duthie, Vice President, and G. J. Madden, Manager.

Suggested Suspension of Coasting Laws.—An application was made recently by parties interested in the lumber business, to obtain a suspension of the coasting laws on the ground that Canadian vessels were not available for freighting from north shore ports in Lake Huron to the south end of Georgian Bay. The Government consulted the Dominion Marine Association on the matter. Few vessels belonging to the association are of a class which could engage in this traffic and the vessels in this trade in former years are still on the lakes and available at present going rates. The lumber trade is of a special nature and the route mentioned is well served by railways, but the association relied on its repeated protests against interference with the coasting laws, and apparently the Government decided that no sufficient reason had been shown for interference.

Merchant Service Certificates and Aliens.—It is announced that the British Board of Trade has decided that during the war every applicant for masters' and mates' certificates must be a British subject, and also that at the time of his birth, both of his parents must have been British subjects. The Dominion Government has not adopted this regulation, but is following its usual practice and admitting British subjects to its examinations.

The Pacific Port Authorities held their third annual convention at Vancouver, B.C., Sept. 4, when a number of papers and matters generally affecting shipping on the Pacific coast and ocean were discussed. During the visit, the harbor was inspected, together with the various improvement works in progress in the vicinity.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during August.

ARTICLES		CANADIAN CANAL	U. S. CANAL	TOTAL
Copper.....	Eastbound	Short tons 173	19,682	19,855
Grain.....	..	Bushels 5,311,716	3,717,589	9,029,305
Building stone.....	..	..Short tons	995,351	1,430,791
Flour.....	..	Barrels 435,440	8,061,430	9,791,933
Iron ore.....	..	..Short tons	2,604	2,604
Pig iron.....	..	..M. ft. b.m.	53,745	56,380
Lumber.....	..	Bushels 12,651,746	12,822,181	25,473,927
Wheat.....	..	..Short tons	53,038	64,704
General merchandise.....	..	..Number	5,616	10,846
Passengers.....	..	..	..	..
Coal, hard.....	Westbound	Short tons 14,000	308,136	322,136
Coal, soft.....	..	192,216	2,232,725	2,424,941
Flour.....	..	Barrels	20	20
Grain.....	..	Bushels	1,200	1,200
Manufactured iron.....	..	Short tons	18,146	20,181
Iron ore.....	..	Short tons	11,424	11,424
Salt.....	..	Barrels	86,133	91,383
General merchandise.....	..	Short tons	39,603	134,614
Passengers.....	..	..Number	6,215	5,051
SUMMARY		Number	1,071	2,800
Vessel passages	..	Net	1,851,311	8,250,325
Registered tonnage.....	..	..	..	10,101,637
Freight—Eastbound.....	..	Short tons	2,278,012	8,786,661
—Westbound.....	..	..	248,604	2,717,985
Total freight.....	..	..	2,526,616	11,504,646

Canadian Pacific Ocean Services Ltd., and the Allan Line.

The C.P.R. report for the year ended June 30, contains the following paragraph: "In consequence of the extraordinary conditions created by the present war your directors considered it advisable to postpone the effective date of the agreement entered into between your company and the Allan Line Steamship Co. and the Canadian Pacific Ocean Services, Ltd., authorized by resolution passed at the last annual meeting, for the acquisition by the last named company of the capital stock of the Allan Line now held by your company and of the vessels of your company named in the resolution. Your directors have, however, thought it desirable to enter into an agreement with the Canadian Pacific Ocean Services, Ltd., under which the vessels of both fleets are operated by that company as managers and agents. In view of possible changes in the conditions pertaining to ocean traffic, your directors consider it may be advisable, in your company's interests, that in giving effect to the proposals previously approved a somewhat different plan should be adopted, and a resolution will be submitted granting authority to your directors to carry out the transaction with the C. P. Ocean Services or some other company created for that purpose, of which company your company will have full ownership and control in such manner and on such terms as seem to them proper. The revenue from your steamships given in the statement of special income is exclusive of an amount transferred to the reserve account to cover the cost of replacing ships sold or destroyed, and of a sum sufficient to meet any tax on excess profits that may be ultimately payable."

Summer Deck Loads of Wood Goods.—The Marine Department has notified the Dominion Marine Association that the British Board of Trade has decided that it will not institute proceedings under sec. 10 of the Merchants Shipping Act, 1906, against masters or owners of vessels arriving in United Kingdom ports between Oct. 31 and Nov. 15, or between Mar. 30 and Apr. 16, with deck cargoes of light or heavy wood goods under other conditions than those allowed by that section, it being understood that the responsibility of masters and owners for ensuring safe and proper loading remains unaffected by the concession. This is an extension of the period for summer deck loads of wood goods, and collectors of customs in Quebec and the Maritime Provinces have been instructed to clear vessels with summer deck loads, for the United Kingdom, up to Nov. 7, and also on and after Mar. 1, 1917, if sailing vessels, and on and after Mar. 12, 1917, if steamships.

The Dominion Government Dredge for St. Lawrence Ship Channel, described in Canadian Railway and Marine World for September, was designed by William Simons & Co., of Renfrew, Scot'and, and not by Charles Duguid, Naval Architect, Marine and Fisheries Department, as stated, owing to an error in this office. The construction of the dredge has, however, been supervised by Mr. Duguid.

The recommended draught for vessels for Lake St. Clair and Lake Erie ports, was reduced 2 in. by the Lake Carriers' Association, Sept. 15, the draught now being 20 ft. 3 ins. The recommended draught for the Sault canals, is 20 ft. 4 ins.

Stranding of the s.s. Fremona Investigated.

Judgment was rendered at Quebec, Aug. 30, re the stranding of the British s.s. Fremona on Anticosti Island, in the St. Lawrence, on July 31. The enquiry was conducted by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Commander Elliott, R.N.R. and Capt. J. Murray. The court's finding is summarized as follows: The court again faces a situation which seems to predominate lately, viz., an attempt to navigate the St. Lawrence on pure assumption. The master acknowledged that he had read the sailing directions and expected to meet currents flowing in a different direction to what was shown on the chart, yet with that knowledge and information he kept his vessel at a speed which cannot be considered as moderate within the meaning of the rule formulated by the Board of Trade regulating the speed of vessels in thick, foggy weather. He has navigated these waters numerous times and is aware of the peculiarities obtaining in other parts of the world as well as here. The court is of opinion that owing to the various warnings given in the sailing directions of the vagaries of currents which may be encountered in the St. Lawrence, the master did not exercise proper prudence, or precautions, so far as speed, compass courses and soundings were concerned. After carefully reviewing all the evidence, the court is of opinion that the master, Arthur Melling, was derelict in carrying out the responsibilities of a master, and greatly erred in judgment in failing to adopt the measures of prudence and caution called for in a forcible manner by the sailing directions which indicate the various elements which tend to throw vessels off their courses in the St. Lawrence. Following the policy which has been followed hitherto, owing to conditions which the war has brought about, occasioning a dearth of masters, the court will not deal with his certificate but reprimands him severely for his lack of caution, prudence and seamanlike carefulness. The court cannot censure the officers then on watch as the master is held responsible, he being on the bridge at the time of the disaster.

British Criticism of the Wreck Commissioner's Judgments.

Reports from England state that the Mercantile Service Association is interesting itself in the case of the stranding of the British steamship Middleham Castle on Matane Reef, Que., July 27, and which was enquired into by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. F. Nash and J. O. Grey as nautical assessors, Aug. 3, at Montreal. It is stated that the association has communicated with the Marine Department at Ottawa with the object of having the case reviewed and the judgment modified, which it considers is an undeserved reflection on the competency of the master of the vessel.

It would appear from the number and the nature of the criticisms of the Wreck Commissioners' judgments, mostly emanating from the Liverpool Journal of Commerce, which is closely in touch with the Mercantile Service Association, that they are launched as a matter of course after the delivery of the judgment, and are made without proper appreciation of facts. The animus displayed in many of

that journal's criticisms is so unreasonable as to discount any good it might do where the circumstances of a particular case make it desirable that the details be reviewed. For a number of years, during which the position of Wreck Commissioner has been held by three different individuals, each of whom has had considerable experience of marine matters generally, and of Canadian navigation in particular, these criticisms have been hurled broadcast, and whatever the intention, the tendency has been, in general, to disparage the St. Lawrence route, and in fact, all shipment to Canada.

In regard to the case of the Middleham Castle which was dealt with in our last issue, the master was reprimanded for venturesome navigation in unknown waters without having surrounded himself with the necessary information for safe navigation. It was mentioned that under different circumstances than exist in regard to shipping at present, and having regard to the fact that the vessel carried Admiralty supplies, the master's certificate would have been suspended for two months. Judging from the evidence, and coupled with the actual knowledge of the route possessed by the Commissioner and the assessors, it was unanimously decided that there had been reckless navigation, and in view of that fact, the statement made by the Journal of Commerce, that "such a sweeping judgment could not possibly be left unchallenged," seems absurd.

In another case, subsequent to that of the Middleham Castle, viz., the s.s. Fremona, the Wreck Commissioner, in dealing with the master in precisely the same manner as he did with the master of the Middleham Castle, said: "The court again faces a situation which seems to predominate lately, viz., to navigate the St. Lawrence on pure assumption."

Telegraph, Telephone and Cable Matters.

The Marconi Wireless Telegraph Co. is arranging to erect a large wireless telegraph station at Juneau, Alaska. A party of the company's men left Vancouver early in September for the north to undertake the preliminary work.

The C.P.R. is arranging to remove all its telegraph poles from Fifth St., Chatham, Ont. The question of the removal of the Great North Western Telegraph Co.'s poles from King, Queen and William Sts., is before the Board of Railway Commissioners.

J. G. Davies, heretofore chief operator, C. P. R. Telegraphs, Montreal, has been appointed Superintendent, Great North Western Telegraph Co., Winnipeg, vice J. Paddington, resigned. S. Goldstein, local manager, Great North Western Telegraph Co., Winnipeg, has resigned.

The Imperial Privy Council has dismissed the Commercial Cable Co.'s appeal against the Newfoundland Supreme Court's decision that it is not entitled to recover \$12,000 and \$10,916.13, alleged to be due under an agreement with the Newfoundland Government. The agreement was in relation to the landing of one of the trans-Atlantic cables at St. John's.

The Great North Western Telegraph Co. has opened offices at Bagotville, Chicoutimi Ouest and Laterriere, Que.; Mar-mora, Ont.; Browning, Merid and St. Brieux, Sask., and Benton Station, Alta., and has closed its offices at Deschaillons, Lake St. Joseph Hotel, Little Metis

Beach, Manoir Richelieu and Pointe au Pic, Que.; Avening and Queens Royal Hotel, Niagara on the Lake, Ont. The names of the following offices have been changed: Paquet, Que., to Linton Jct.; Berlin, Ont., to Kitchener, and Deerfield, Man., to Grahamdale.

James Gibbs Davies, who has been appointed Superintendent, Great North Western Telegraph Co., Winnipeg, was born at Hot Springs, Ark., June 20, 1877, and entered telegraph service at Helena, Mont., as a messenger, and soon became an operator. He was subsequently appointed local manager, Western Union Telegraph Co., Anaconda, Mont., and on Oct. 22, 1902, was transferred to New York, and placed in charge of certain of the company's offices in the Fulton fish market district, and later was appointed District Manager for the company there. After leaving New York, he was for some time in the service of the Great North Western Telegraph Co., at Ottawa, Ont., and in July, 1912, entered C.P.R. Telegraphs service, where he has been agent at Victoria, B.C., and latterly chief operator and circuit manager at Montreal.

Telegraph companies operating in the Dominion are now handling day lettergrams, on a somewhat similar basis to the night lettergrams which have been in use for some time. The C.P.R. Telegraphs and Grand Trunk Pacific Telegraphs placed the system in operation Aug. 28, and the Great North Western Telegraph Co., on Sept. 1. The service is a deferred one at rates lower than the standard rates, being as follows:—1½ times the 10 word day message rate for 50 words or less, and 1/5 the initial rate for each additional 10 words or less. These messages are subordinate to the priority of transmission and delivery of regular messages, and must be written in plain English, or in French between places in Canada, and code words are not permissible. The C.P.R. and G.T.P. services are only between places in Canada, while the Great North Western service, in conjunction with the Western Union Telegraph Co., covers all stations on the two systems in Canada and the U.S.

Marconi Wireless Telegraph Co. of Canada, Ltd.

The following are extracts from the report for the year ending Jan. 31, 1915:—The company's business continues to show substantial expansion. The most gratifying feature during the year just concluded has been the steady development of the transatlantic traffic. In spite of the general dislocation of business created by war conditions, the work being done by the Glace Bay station in

maintaining direct communication between Canada and Europe shows a satisfactory increase in traffic handled, and in income resulting from that source. There is every evidence of this improvement being maintained during the current year. The unique value of Marconi wireless in every phase of the present war is a matter of common knowledge; its supreme value during possible isolation of any country during interruption of cable communication has been demonstrated on two occasions during the past year when the business community of Canada was to a large extent dependent on the Marconi service between Glace Bay and Ireland.

The plant in Montreal has been kept fully occupied in supplying the demand for additional installations on board ships and commercial stations, as well as in meeting increased government requirements. A growing sentiment is apparent amongst progressive shipowners that no vessel engaged in coastwise or ocean trade is fully equipped unless furnished with a Marconi wireless installation, and wireless stations aboard ship are now being viewed with favor even on vessels exempt by law from compulsory equipment. A total of some 2,300 mercantile vessels have up to the present been fitted with Marconi wireless stations by the various Marconi companies.

Your directors appreciate that the good will of the public constitutes a most valuable asset to the company, and have accordingly extended the facilities of its marine department in order to give the best possible service to its patrons by creating divisional offices and stores in the more important centres of St. John's, Nfld., Toronto and Vancouver. Owing to the constant demands on the operating staff caused by the war, a school of instruction for operators has been established in Montreal under the direct control of the company, and equipped with the latest type of standard apparatus.

The adverse effect caused by the company's normal traffic to and from ships, owing to the stringency of censorship imposed on commercial messages, has unfortunately continued in evidence throughout the current period. The basis of remuneration from the Government for the use of a number of the company's coast stations taken over by the Naval Service Department since the commencement of hostilities, and for other services rendered, is still under consideration, and an equitable settlement is awaited in the near future.

The profit for the year was \$110,226.06.

At the annual meeting in Montreal the retiring directors were re-elected as follows:—A. A. Allan, Senatore G. Marconi, J. N. Greenshields, K.C., Robert Bickerdike, M.P., G. C. Isaacs, G. M. Bosworth, W. D. Birchall, E. J. Nally, J. H. Lauer.

Among the Express Companies.

J. A. Ravin has been appointed agent, Canadian Northern Ex. Co., Moose Jaw, Sask., vice L. I. Watts transferred.

H. D. Peak, from the Seattle, Wash., office, is acting as agent, American Ex. Co., Vancouver, B.C., during the illness of L. Dassonville.

The Canadian Northern Ex. Co. has opened offices at Dropmore and East Selkirk, Man.; Browning, Merid, Fairmount, and St. Brieux, Sask.; and Benton, Alta., and has closed its offices at Stoco, Ont., and Parry, Sask.

The British Columbia Electric Ry. has started an express service. Express consignments for New Westminster and points on the Fraser Valley line will be picked up in Vancouver, and deliveries made in Vancouver from points outside.

F. S. Cox, an employee of the Canadian Northern Ex. Co., at Saskatoon, Sask., who enlisted in the early stages of the war, and has been in France for some time, has been awarded the distinguished conduct medal for coolness and bravery under fire and for volunteering to bring in wounded men.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Canadian Westinghouse Co. has issued a circular, H-7001, descriptive of type K auto starters for squirrel cage induction motors of from 7½ to 300 h.p., 110 to 2,200 volts, 25 to 60 cycles. Detailed illustrations are given, with tables showing the particular type to use for special work.

The Independent Pneumatic Tool Co. has made arrangements with the Garlock-Walker Machinery Co., 70 Front St., Toronto, to act as agents for the sale of pneumatic tools in Ontario east to Belleville. The line of pneumatic tools consists of piston air drills, reversible and non-reversible, for drilling, reaming, tapping, flue rolling and wood boring; close corner air drills; pneumatic grinders; pneumatic hammers for riveting, chipping, calking and flue beading; electric drills and grinders; pneumatic tool hose, hose couplings and spart parts. A stock will be carried by the Garlock-Walker Machinery Co. The Independent Pneumatic Tool Co. also maintains its own office at 334 St. James St., Montreal.

"DREW" Electric Railway Specialties

Overhead Materials
Frogs
Samson Splicers

Curve Suspensions
Drew Safety Mirrors
Drew Pole Sleeves

Feed-in Hangers
Strain Plates
Cable Insulation

Cable Splicing
Cable Insulators
Strain Insulators

Each spells Electric Railway Economy and Better Service. OUR CATALOG tells why you need these better operation devices. Write for your copy today

DREW ELECTRIC & MFG. COMPANY, Indianapolis, Ind.

Canadian Representatives:

C. E. A. CARR CO.

2 Toronto Street

TORONTO, ONT.

Transportation Conventions in 1916.

Oct. 2, 3.—American Association of Travelling Passenger Agents, Philadelphia, Pa.

October 3-5.—Railway Fire Protection Association, New York.

Oct. 9-13.—American Electric Railway Association, Atlantic City, N.J.

October 10.—Association of Manufacturers of Chilled Car Wheels, New York.

Oct. 11.—Association of Water Line Accounting Officers, Jacksonville, Fla.

Oct. 11.—Railwaymen's Tax Association, Chicago, Ill.

Oct. 17, 18.—American Association of Passenger Traffic Officers, Washington, D.C.

Oct. 17-19.—American Association of Railway Surgeons, Chicago, Ill.

October 17-19.—American Railway Bridge and Building Association, New Orleans, La.

October 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Philadelphia, Pa.

Oct. 18-20.—Society of Railway Financial Officers, Washington, D.C.

Oct. 19-21.—American Association of Dining Car Superintendents, New Orleans, La.

Nov. 14.—National Association of Railway Commissioners, Washington, D.C.

Nov. 15.—American Railway Association, Denver, Col.

Dec. 5-7.—Railway Gardening Association, New Orleans, La.

Dec. 12, 13.—Association of Transportation and Car Accounting Officers, Atlanta, Ga.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated:

Canadian Car Service Bureau—W. J. Collins, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.

Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Associations—E. de la Hooke, London, Ont.

Dominion Marine Association—F. King, Counsel, Kingston, Ont.

Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.

Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.

Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.

Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.

International Water Lines Passenger Association—M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee—James Morrison, Montreal.

Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.

Quebec Transportation Club—A. F. Dion, Quebec.

Shipping Federation of Canada—Thos. Robb, Manager, 42 St. Sacrament Street, Montreal.

Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.

Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.

Transportation Club of Vancouver—H. W. Schofield, 553 Granville St., Vancouver, B.C.

Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.

Western Canada Railway Club—Louis Kon, Box 1707 Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Winnipeg Traffic Club—James Gebrey, Bannatyne Avenue, Winnipeg, Man.

Sailors' Institute at Toronto.—It was expected to complete the building of the Sailors' Institute at Toronto, during September. It is of wood, covered with zinc in imitation of blocks, and is situated on the south side of Lake St., between Yonge and Bay Sts. The accommodation provided covers a reading and recreation room, office with facilities for the operation of a free shipping registry, and the customary sailors' library.

JOLIETTE STEEL CASTINGS

TRADE MARK REGD.

Your needs for car and locomotive steel castings are most satisfactorily filled by drawing upon the capacity and organization of

Joliette Steel Company Limited

Main Office
903 Read Bldg., Montreal Que.

Works at
Joliette, Que.

Telephone Main 402

CASTINGS MADE IN CANADA

"STERLING" Hack Saws



Sterling
HIGH SPEED POWER SAW

A Combination that will save money for you.

Manufactured by

Diamond Saw & Stamping Works,
Buffalo, N.Y., U.S.A.

The Preston Car & Coach Co., Limited

Preston, Ont.

Manufacturers of
Steam and Electric
Railway Cars and
Special Cars.

Car Closets

Flush or Dry

DUNER CO. 101 S. CLINTON ST.
CHICAGO

It Pays to carry an advertisement in the Canadian Railway and Marine World every issue of the year because you obtain proportionately better **Results**

Hunt-Spiller Gun Iron

IN

Locomotive Castings

SAVES MONEY

INCREASES: Engine Efficiency—Engine Mileage.
DECREASES: Engine Failures—Engine Repairs.

MADE ONLY BY

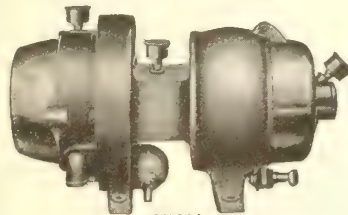
Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.

J. G. Platt,
Sales Manager.

Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.



70 Schroeder Incandescent Headlights

In Service

270 days without any expense for repairs.
As a result of this exceptional service
150 more have just been ordered.

The HIRAM L. PIPER CO., Limited

MONTREAL, Sole Agents for Canada

The Light of Day on the Right of Way

Headlights

Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

Car Lighting

Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency with economy. Standard cylinder supplies from one to two months' lighting of the average car.

Signals

Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

Commercial Acetylene Railway Light and Signal Company

103 BAY STREET, TORONTO

Main Office, 80 Broadway, New York

Branches, Atlanta, Boston, Chicago, San Francisco



CARTER'S

DRY

Red Lead - Orange Lead - Litharge

What are your requirements for Dry Red Lead, Litharge or Orange Lead? We are offering you a Canadian made product manufactured by a Canadian Company.

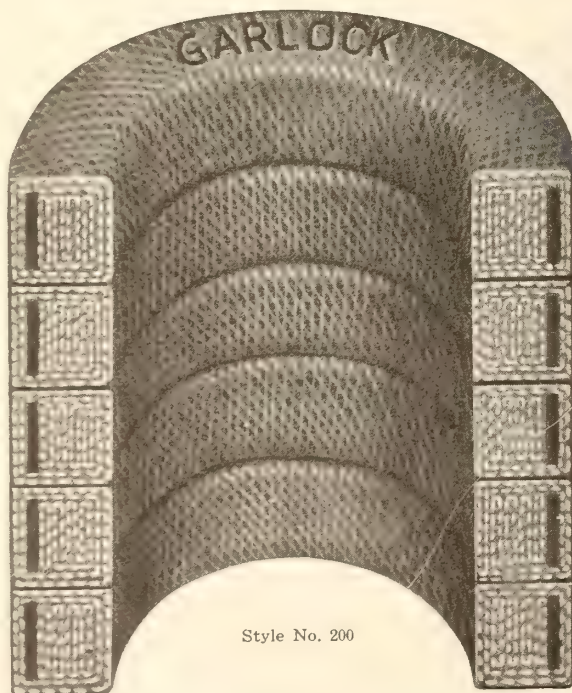
The best quality of Red Lead, Orange Lead or Litharge can be procured right here in Canada at the most favorable prices. The highest standards are strictly observed and your requirements can be filled completely without any delay, and to your entire satisfaction.

We manufacture special Red Lead and Litharge for Color Makers, Rubber Makers, and Varnish Makers, and are also manufacturers of Oxides, specially suited to Potters and Storage Battery Makers.

Do not let this opportunity go by but drop us a line and ask us for our prices and further information regarding our products.

THE CARTER WHITE LEAD COMPANY of Canada, Limited

91 Delorimier Avenue, MONTREAL



Style No. 200

Garlock High Pressure Piston Rod Packing

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.

THE GARLOCK PACKING COMPANY

-

Hamilton, Ontario



Branches :

Montreal, Que., 342 St. James St. East

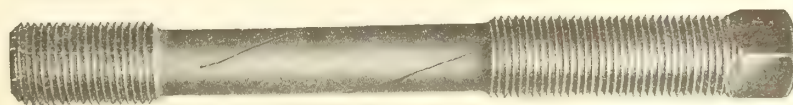
Toronto, Ont., Continental Life Bldg.

Winnipeg, Man., Galt Building



American Flexible Staybolts

Manufactured in Montreal



Made of the best standard staybolt iron, adding flexibility by process of making as shown above---closely approximating a rope structure.

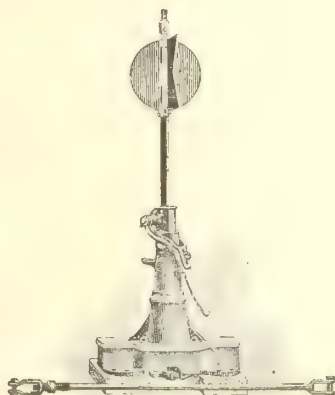
Write for booklet on subject.

TAYLOR & ARNOLD, Limited
MONTREAL WINNIPEG

RAMAPO

**Automatic
Safety
Switch
Sands**

in types to suit every
purpose, Main Line,
Sidings and Yards

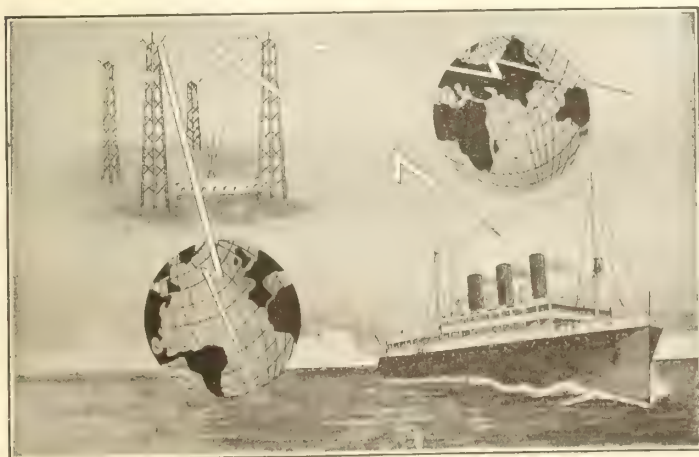


We also
make

**FROGS
SWITCHES
CROSSINGS**

in both all rail
and Manganese

CANADIAN RAMAPO IRON WORKS, Limited, Niagara Falls, Ont., Can.



OF THE WORLD'S WIRELESS
STATIONS 80% ARE ON THE MARCONI SYSTEM.

LET US SUBMIT SUGGESTIONS !

Marconi Wireless Telegraph Apparatus

MADE IN CANADA.

Wireless equipment of all kinds supplied: Land, ship, railway and aeroplane sets with ranges of from 50 to 2,000 miles.

Have you considered the advantages of connecting up factory or mine to head office by wireless telegraphy?

SHIP SETS—Suitable for liners, yachts, tugs and freight boats and scows—our specialty.

Our stations may be hired or bought outright.

**The Marconi Wireless Telegraph
Company of Canada, Limited**

Shaughnessy Building,

MONTREAL

ENAMELED IRON SIGNS

The ideal signs for
Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.

We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc,

Guaranteed not to
fade or be affected
by the weather in
any way.

Acton Burrows
Limited

Enameled Iron Signs

70 Bond Street - Toronto

"Claude" Oxygen Oxy-Acetylene

WELDING AND CUTTING PLANTS
MADE IN CANADA

All large railway shops are applying
our systems to numerous uses. Weld-
ing frames, building up tires, boiler
patches, welding flues. Also for cut-
ting up scrap.

Cut out coupon for interesting booklet.

L'Air Liquide Society

*Three Canadian Distributing
Stations*

26 Boler Street, West Toronto
325 William Avenue, Winnipeg
Maisonneuve, Montreal

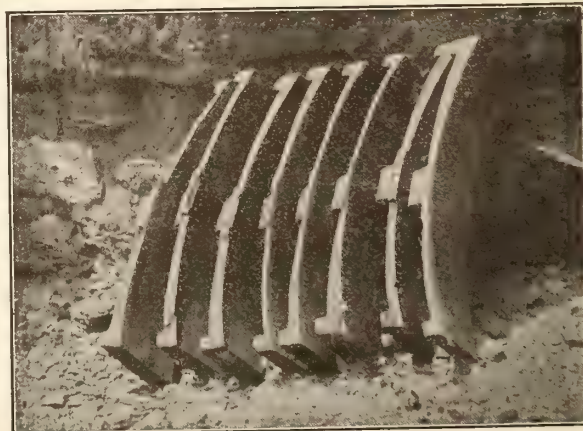
L'Air Liquide Society, Maisonneuve,
MONTREAL, P.Q.

Gentlemen,—Will you please send, with-
out obligation to me, postpaid, your New
Booklet?

Name
Address
Province Date
Business

R & M

Reinforced Brake Shoes



wear as shown above, before they are scrapped and they wear safely,
too. You get your full money's worth in satisfactory service from them
always.

Reinforced Car, Coach and Driver Shoes are absolutely essential for
safe and economical operation in all classes of railway service.

Manufactured in Canada.

Dominion Brake Shoe Company, Limited

350-356 St. James Street, Montreal.

The Holden Co., Limited, Agents



*"We are protecting
this steel work RIGHT"*

"WE are using the same paints in this building of yours that were used on the Pennsylvania Station, the Metropolitan Tower and the Hell Gate Bridge in New York. They are the greatest steel preservatives ever invented, and are known as

TOCKOLITH AND **R.I.W.**
THE PATENTED CEMENT PAINT DAMP-RESISTING PAINT

Tockolith, in drying, illustrates lime and in this way deposits a hard cement coating on steel. It combines with incipient yellow rust when present, stopping further oxidation.

Tockolith and a finishing coat of R. I. W. Damp-Resisting Paint keep steel work in perfect condition.

Write for Tockolith Booklet from Dept. 56.

Manufactured in Canada by

R. I. W. DAMP-RESISTING PAINT CO.
TOCH BROTHERS

Gerrard St. and Carlaw Ave.
TORONTO, ONTARIO, CANADA

STANDARD Colonial Copper Clad Wire

TRADE **C.C.C.** MARK

has satisfactorily met the requirements of large and discriminating buyers for many years. Its economy in installation and maintenance has therefore been proven by years of exacting service tests. There may be many places in your electric systems where C. C. C. Wire can be economically employed.

For further information write our nearest office for new C.C.C. Bulletin No. 202.

Standard Underground Cable Co., of Canada, Limited

General Offices & Works:
Hamilton, Ont.

Montreal, Que.
Hamilton, Ont.

Winnipeg, Man.
Seattle, Wash.

ESTABLISHED 1849.

BRADSTREET'S

Capital and Surplus, \$1,500,000.
Offices throughout the Civilized World.

Executive Offices:
NOS. 345 and 348 BROADWAY,
N.Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA:

Halifax, N.S.; Hamilton, Ont.; London, Ont.;
Montreal, Que.; Ottawa, Ont.; Quebec, Que.;
St. John, N.B.; Toronto, Ont.; Vancouver, B.C.;
Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.;
Victoria, B.C.

THOS. C. IRVING,

Gen. Man. Western Canada, Toronto.

Dominion Bridge Company, Limited

Head Office and Works,
MONTREAL, P.Q.

Branch Offices and Works,
TORONTO, OTTAWA and WINNIPEG



Lachine Bridge

Engineers, Manufacturers and Erectors of Steel Structures.
CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

Large Stock of Standard Structural Material at all Works.



Capital Authorized.....\$10,000,000
Capital Paid up.....7,000,000
Reserve Fund.....7,000,000

Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the World.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.



Which Method

prevails in your plant? Does it take two men to do one man's work.

Why don't you replace that old antiquated tool with a new up to date

Reece's New Screw Plate

These pictures do not exaggerate conditions as you can actually see them, if you will visit Machine Shops throughout the country.

Lessen your cost by giving your mechanics a REECE'S NEW SCREW PLATE.

Butterfield & Co., Inc.
Rock Island, Que,

The Ottawa Car Manufacturing Co., Limited

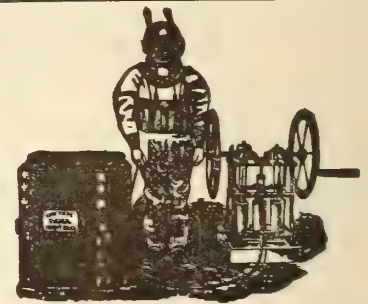
Builders of

Electric Cars, Snow Sweepers and Plows

Also

Producers of Brass Castings of Every Description.

Slater Street - Ottawa



JOHN DATE

Manufacturer of

Diving Apparatus

For Sale or Hire

Brass Founder and Coppersmith
13-15 Concord St., Montreal

"BEATTY" HOISTS

For situation where the work is severe and the service exacting—"a Beatty laways fills the bill"



Derrick car engined with an 8 x 12 four drum Beatty Hoist placing an 80 foot deck plate girder span in Skugog River Bridge.

Let us know your requirements for
Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

We will gladly send full information.

M. Beatty & Sons Limited - Welland

Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg, Winnipeg.

Insist on having
DREWRY'S
American
STYLE RICE
BEER

The best beer—
without exception

E. L. Drewry, Ltd., Winnipeg

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Celebrated Wheel Truing Brake Shoe. Best Wheel Grinders in the World.

Engineers and Contractors**ANGUS SINCLAIR, C.E.***Railway Contractor*Office: Imperial Bank Building,
King and Sherbourne Sts., Toronto.**Locomotive COALING STATIONS****ROBERTS AND SCHAEFER CO.**ENGINEERS AND CONTRACTORS
CHICAGO U.S.A.Edward F. Terry
PresidentFrederick Tench
V. P. & Treas.**The TERRY & TENCH CO., Inc.***Bridge Builders*General Contractors, Engineers and Designers
Grand Central Terminal NEW YORK**THE ARNOLD COMPANY**ENGINEERS—CONSTRUCTORS.
ELECTRICAL—CIVIL—MECHANICAL
REPORTS, DESIGN AND CONSTRUCTION
Complete Railway Shop and Terminal Properties—
Electrification of Steam Railroads.
OUR EXPERIENCE COVERS THIRTY-FIVE PLANTS
111 Broadway, New York, Chicago, Illinois.**Patent Solicitors****PATENTS****HERBERT J. S. DENNISON**Mechanical Engineer, Patent Attorney and Expert.
Patents, Trade Marks, Designs, Copyrights, and
Infringements. 20 Years experience in Patents
and Practical Engineering.Star Building, 18 King Street West, Toronto
WRITE FOR BOOKLET.**PATENTS SECURED OR OUR FEES RETURNED.**

Being next door to the Patent Office; we have personal interviews with Examiners, thus earlier allowance of your Patents. We have access to all Records and solicit the business of Manufacturers, Engineers and others who realize the advisability of having their Patent business transacted by Experts.

HAROLD C. SHIPMAN & CO.

Reg. Patent Attorneys.

Ottawa, Canada

ROBERT W. HUNT
THOS. C. IRVING JR.CHARLES WARNOCK
JAS. W. MOFFAT**Robert W. Hunt & Co., Limited****Consulting and Inspecting Engineers
Chemists and Metallurgists**Expert examination and tests of all steel and metal products;
Bridges, Buildings, Cement; Electrical and Mechanical Plant
Equipment; Rails and Fastenings; Cars; Locomotives; Pipe;
Castings; Forgings; Lumber; Paving Materials.Resident inspectors at all important manufacturing centres in
Canada, the United States and Great Britain.

REPORTS ON PROPERTIES AND PROCESSES.

Head Office and Laboratories:

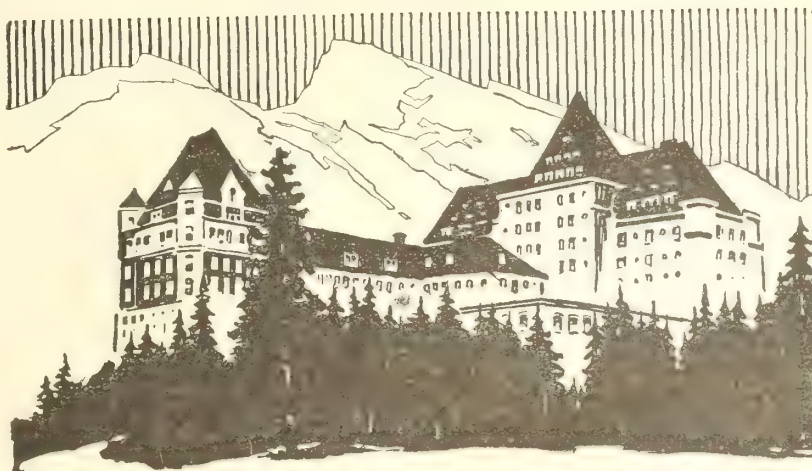
McGill Building,

Branches: TORONTO

VANCOUVER

MONTREAL, QUE.

LONDON, ENGLAND

**Minarets and Mountain Peaks**

at luxurious Banff—in the very heart of the

Canadian Pacific Rockies

At Banff are all the fine touches of social life, good table, good service, every possible comfort at moderate cost. From the stone pillared verandah or from the wide windows of the hotel, lies spread the great panorama of Alps and river.

Reached only by the world's greatest transportation system—the

Canadian Pacific Railway

which maintains hotels at Banff, Lake Louise, Field, Glacier, Balfour.

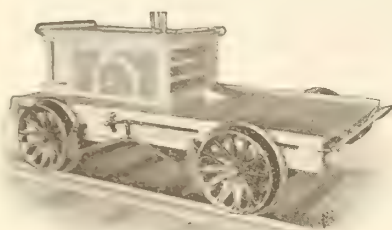
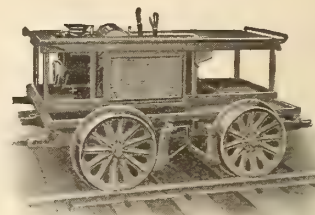
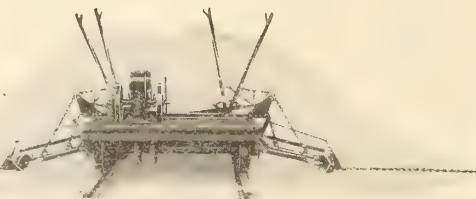
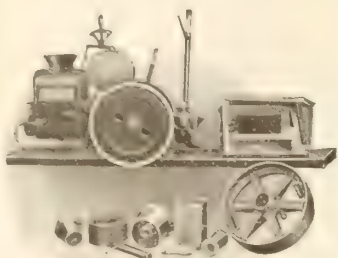
Everything Canadian Pacific Standard—None Better.

For further information apply to
any Canadian Pacific Ticket
Agent or W. B. Howard, District
Passenger Agent, Toronto.**Rails, Cars,****Locomotives**

and Contractors' Equipment

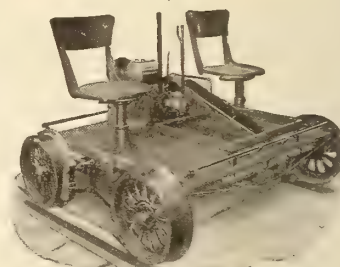
IMMEDIATE
SHIPMENT**John J. Gartshore**58 Front St. West
TORONTO

FAIRMONT WINS GOLD MEDAL



The excellence of FAIRMONT Railway Motor Cars is attested by their receiving the highest competitive award, a gold medal, at the Panama-Pacific International Exposition, San Francisco.

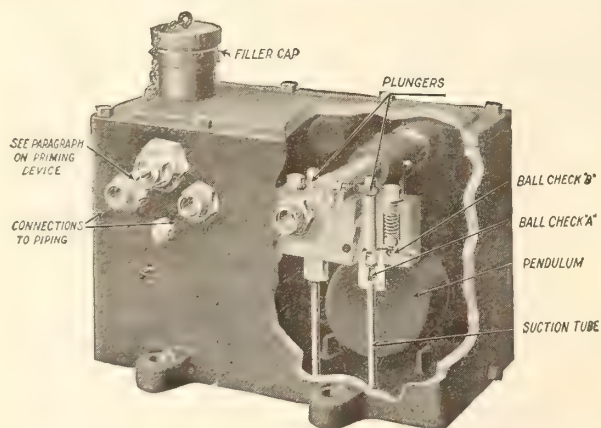
Years of good service on Canadian railroads has proven the justice of this award. When you need a motor car, specify "FAIRMONT". Instalment terms to private buyers.



FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

Formerly Fairmont Machine Co.

445 N. MAIN ST., FAIRMONT, MINNESOTA, U.S.A.



Here is How You Can Reduce Your Flange Wear

Ask your Master Mechanic how rapidly flanges are cutting and what it costs to turn tires down. Ask him what the money value of correct flange lubrication will be, and if you want more testimony, we can furnish reports from other Master Mechanics that give conclusive proof of the value of correct flange lubrication by means of the

Detroit Automatic Flange Lubricator (Pendulum Type)

The pendulum of which oscillates with the movement of the locomotive operating the plunger pump and forcing oil to the flanges entirely independent of Air, Steam or Engineman.

Booklet FO-75 gives full description. Send for it.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.
WALKERVILLE, ONT.

Makers of the Stewart Carburetor.

**John Morrow Screw & Nut Co.,
Limited.**

BUSINESS AS USUAL

Set Screws
Cap Screws
Nuts, every variety
of finish
Twist Drills, etc.

Customers are requested to place their specifications with us as far ahead of their actual needs as possible so that we may give them good service.

INGERSOLL - ONTARIO

Electric Railway Supplies

Detroit Controller Checks.
Peerless Check Valves.
Hollis Safety Fender.
Bakalite Arch-leaves, Brush holders
Yokes and Rods.
Bakalite Washers and Asbestos
Board.
Gongs, Bells and Air Whistles.

Allen General Supplies, Ltd.
205 Yonge Street Toronto

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies.

AERATED WATERS

E. L. Drewry
AIR BRAKES AND FITTINGS
Canadian Westinghouse Co.

ALES

E. L. Drewry

ANGLE BARS

Steel Co. of Canada

AUTOMOBILES

Preston Car & Coach Co.

AXLES

Nova Scotia Steel and Coal Co.

Jas. W. Pyke & Co.

Steel Co. of Canada.

BATTERIES, DRY

Canadian National Carbon Co.

BATTERIES, SIGNAL

Canadian National Carbon Co.

BATTERIES, STORAGE

Canadian National Carbon Co.

BATTERIES, TRACK

Canadian National Carbon Co.

BATTERY SUPPLIES

Canadian National Carbon Co.

BATTERY SUPPLIES

Canadian National Carbon Co.

BOILER COMPOUND

Dearborn Chemical Co. of Canada

BOILERS

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

BOILERS, PORTABLE

Polson Iron Works

BOILERS, STATIONARY AND MARINE

Polson Iron Works

BOILERS, STEAM

Polson Iron Works

BOILERS, WATER TUBE

Babcock & Wilcox

Polson Iron Works

BOLTS AND NUTS

Steel Co. of Canada

BOLTS, TRACK

F. H. Hopkins & Co.

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

BORERS, CAR WHEEL

John Bertram & Sons Co.

Canada Machinery Corporation

BRAKE BEAMS

Buffalo Brake Beam Co.

BRAKE SHOES

Canada Iron Foundries

Canadian Brakeshoe Co.

Dominion Brakeshoe Co.

BRAKE SHOES, LOCOMOTIVE DRIVER

Canada Iron Foundries

BRIDGE BUILDERS

Terry & Tench Co.

BRIDGE NUMBERS

Acton Burrows, Limited

BRIDGES

Canadian Bridge Co.

Dominion Bridge Co.

BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION

Canadian National Carbon Co.

BUCKETS, COAL, ORE AND CONCRETE

M. Beatty & Sons

Brown Hoisting Machinery Co.

F. H. Hopkins & Co.

BUILDINGS, STEEL

Canadian Bridge Co.

Dominion Bridge Co.

BUMPING POSTS

F. H. Hopkins & Co.

CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED

Standard Und. Cable Co. of Can.

CARBONS, ARC LAMP, FLARE

ARC AND PHOTOGRAPHIC

Canadian National Carbon Co.

CAR CLEANER

Allen General Supplies, Ltd.

CAR SIGNAL SYSTEMS

Ohio Brass Co.

CARS

Eastern Car Co.

Hart-Otis Car Co.

National Steel Car Co.

Ottawa Car Mfg. Co.

Preston Car & Coach Co.

CASTINGS, BRASS

Canada Iron Foundries

Canadian Bronze, Limited

CASTINGS, CAR

Canada Iron Foundries

Dominion Brakeshoe Co.

CASTINGS, IRON

Canada Iron Foundries

Hunt-Spiller Manufacturing Corp.

CASTINGS, IRON AND STEEL

Dominion Brakeshoe Co.

Dominion Steel Foundry Co.

CASTINGS, MALLEABLE

Taylor & Arnold

CASTINGS, MANGANESE STEEL

Canadian Steel Foundries, Ltd.

CASTINGS, STEEL

Dominion Steel Foundry

Joliette Steel Co.

CATENARY MATERIALS

Ohio Brass Co.

CHAINS

B. J. Coghlin Co.

F. H. Hopkins & Co.

CLOSETS, CAR

Duner Co.

COAL

Nova Scotia Steel and Coal Co.

COAL CHUTES

Roberts & Schaefer Co.

COAL DOCK BRIDGES

Roberts & Schaefer Co.

COAL MINING AND WASHING PLANTS

Roberts & Schaefer Co.

COALING STATIONS

Roberts & Schaefer Co.

COMPRESSORS, AIR

Canadian Ingersoll-Rand Co.

F. F. Hopkins & Co.

CONCRETE MIXERS & ROCK CRUSHERS

F. H. Hopkins & Co.

CONTRACTORS' SUPPLIES

F. H. Hopkins & Co.

Rice Lewis & Sons

CONVEYORS, COAL AND ASH

Babcock & Wilcox

COPPER, RODS AND WIRE

Standard Und. Cable Co. of Can.

COUPLERS, CAR & LOCOMOTIVE

Canadian Steel Foundries, Ltd.

Ohio Brass Co.

Taylor & Arnold

CRANES

Brown Hoisting Machinery Co.

CRANES, WRECKING

F. H. Hopkins & Co.

CRANES, ELECTRIC

Babcock & Wilcox

Dominion Bridge Co.

F. H. Hopkins & Co.

CRANES, TRAVELLING

F. H. Hopkins & Co.

CROWBARS

B. J. Coghlin Co.

CULVERTS

Pedlar People, Ltd.

CURTAINS AND FIXTURES, CAR

Du Pont Fabrikoid Co.

Preston Car & Coach Co.

CUTS

Acton Burrows, Limited

DERRICKS

F. H. Hopkins & Co.

DIES

Butterfield & Co.

DITCHERS

M. Beatty & Sons

F. H. Hopkins & Co.

DOOR SIGNS

Acton Burrows, Limited

DRAFT GEAR

Standard Coupler Co.

DREDGES

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

DRILLS

Canadian Ingersoll-Rand Co.

John Morrow Screw & Nut Co.

DRILLS, AIR

F. H. Hopkins & Co.

Independent Pneumatic Tool Co.

DRILLS, RADIAL

Canada Machinery Corporation

DRILLS, VERTICAL

Canada Machinery Corporation

DRILLS, WELL

F. H. Hopkins & Co.

DUMP CARS, CONTRACTORS'

Hart-Otis Car Co.

F. H. Hopkins & Co.

DYNAMO AND ELECTRIC CASTINGS

Dominion Brakeshoe Co.

ECONOMIZERS

Babcock & Wilcox

ELECTRIC CAR ROUTE SIGNS

Acton Burrows, Limited

ENAMELED IRON SIGNS

Acton Burrows, Limited

ENGINEERS

Arnold Co.

Roberts & Schaefer Co.

Angus Sinclair & Co.

ENGINES, AUTOMATIC

Polson Iron Works

ENGINES, HOISTING

M. Beatty & Sons

Canadian Ingersoll-Rand Co.

F. H. Hopkins & Co.

Polson Iron Works

ENGINES, STATIONARY AND MARINE

Polson Iron Works

ENGINES, STEAM

F. H. Hopkins & Co.

EXPRESS OFFICE SIGNS

Acton Burrows, Limited

FARE BOX HOLDERS

Coleman Fare Box Co.

FARE BOXES, P.A.Y.E. OPERATION

Coleman Fare Box Co.

FARE BOXES, PORTABLE AND STATIONARY

Coleman Fare Box Co.

FILES

Nicholson File Co.

FORGINGS

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

FROGS

Canadian Ramapo Iron Works

Drew Electric & Mfg. Co.

GAUGE COCKS

Ohio Brass Co.

GAUGES, LOCOMOTIVE

Taylor & Arnold

GEARS AND PINIONS

Allen General Supplies, Ltd.

GRATES, SHAKING

Babcock & Wilcox

Polson Iron Works

HAMMERS, CAST STEEL

Dominion Brakeshoe Co.

F. H. Hopkins & Co.

HANDCARS

F. H. Hopkins & Co.

Rice Lewis & Sons

HANGERS, CABLE

Standard Und. Cable Co. of Can.

HEADLIGHTS

Ohio Brass Co.

HEATING, CAR

Chicago Car Heating Co.

Consolidated Car Heating Co.

HOISTS, PNEUMATIC

Taylor & Arnold

HOISTS, STEAM

M. Beatty & Sons

HOOKS

Steel Co. of Canada

HOPPERS, CAR, WET OR DRY

Duner Co.

ILLUSTRATIONS

Acton Burrows, Limited

INSPECTIONS

R. W. Hunt & Co.

INSULATORS, PORCELAIN

Drew Electric & Mfg. Co.

Ohio Brass Co.

INSURANCE, ACCIDENT

Imperial Guar. & Acc. Ins. Co.

INTERLOCKING PLANT AND SIGNALS

Canadian Steel Foundries, Ltd.

Gen. Railway Signal Co. of Can.

IRON AND STEEL BARS

Steel Co. of Canada

IRON SIGNS

Acton Burrows, Limited

IRON, PIG



Showing the construction of our geared jacks.

Celebrated "H & E" Lifting Jack

Our Patent Ball-Bearing Geared Jacks are Ideal in Railroad and Heavy Construction Work.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

SHERBROOKE, QUE.

Sole Agents for Brakeshoes for Canada outside of B.C., Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for B.C., The B.C. Equipment Co., Vancouver, B.C. Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.

High Grade Electric
STEEL CASTINGS
MANGANESE STEEL
For Crusher Jaws and Heavy
Wear Parts

BRONZE

M.C.B. Standard Journal Bearings and Engine Bearings

Improved Reinforced Steel-Backed

BRAKESHOES

Locomotive Driver and Truck Shoes. Freight and Passenger Car and Electric Car Shoes.

Consolidated

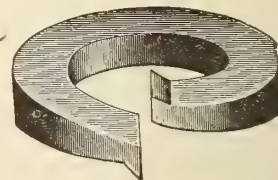
The ORIGINAL electric heater. Patented ventilated core. Glazed. Patented return lead with connections at one end. Light pressed steel construction. Rust-proofed. In use on 70,000 out of 90,000 cars now operating.

Consolidated Car-Heating Co.

New York — Albany — Chicago
DAWSON & CO., Agents, MONTREAL

The Positive Lock Washer

is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks

The Positive Lock Washer Co.

Sole Mfrs., Newark, N.J.

F. H. HOPKINS & CO.,

Agents, Montreal

Complete Hydraulic Equipment

For Railway and Shipbuilding Plants

Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc. Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast Iron Pipe, Hydrants, Valves and Fittings, etc.

R. D. WOOD & CO. Philadelphia, Pa.

FOR TICKET CASES AND COMMERCIAL FURNITURE

of all descriptions to stock or special design, apply to

The Canadian Office and School Furniture Co., Limited
Preston - Ontario

The Canadian Bridge Co., Limited

Walkerville, Ontario

Locomotive
Turntables
Roofs
Steel Buildings

Manufacturers of

Railway and Highway BRIDGES

Structural
Iron Work
of all
Descriptions

Sessions-Standard Friction Draft Gear

Simplest and Best

Both
Made by
Standard Coupler Co.
30 CHURCH STREET, NEW YORK

Standard Steel Platforms

Used by all Canadian Railways

C. W. Sherman, Pres. and Gen. Mgr.

F. W. Ballie, Vice-Pres.

A. G. Wright, Secy.

Dominion Steel Foundry Company, Limited, Hamilton, Ont.

Locomotive Frames

Car Bolsters

Car Castings

Heavy Machinery Castings

CHICAGO CAR HEATING CO.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES

Canadian Factory and Office—61 Dalhousie St., Montreal

GENERAL OFFICES:

RAILWAY EXCHANGE, CHICAGO, U.S.A.
NEW YORK, GRAND CENTRAL TERMINAL BLDG.
ATLANTA GA., CANDLER BLDG.
WASHINGTON, D.C., MUNSEY BLDG.

A. D. BRUCE, Agent

MANHOLE FRAMES & COVERS

Canada Iron Foundries
Dominion Brakeshoe Co.
MARINE PAINTS AND VARNISHES
Toch Bros.
MARINE REPAIRS
Goldschmidt Thermit Co.
MARINE SUPPLIES
Rice Lewis & Sons
METALS
Goldschmidt Thermit Co.
METAL WORK, STRUCTURAL
Canadian Bridge Co.
Dominion Bridge Co.
Jas. W. Pyke & Co.
MILEPOST NUMBERS
Acton Burrows, Limited
MOMEL METAL
International Nickel Co.
MOTOR CARS
Fairmont Gas Engine and Ry.
Motor Car Co.
MOTORS, TURNTABLE
Taylor & Arnold
NAILS, CUT AND WIRE
Steel Co. of Canada
NICKEL, SHEET, ROD, WIRE & TUBE
International Nickel Co.
NUMBERS
Acton Burrows, Limited
NUT LOCKS
Positive Lock Washer Co.
OFFICE FITTINGS
Can. Office & School Furn. Co.
OFFICE SIGNS
Acton Burrows, Limited
OILS
Galena-Signal Oil Co.
PACKING
Canuck Supply Co.
Garlock Packing Co.
PAINTS
Toch Bros.
PATENT ATTORNEYS
H. J. S. Dennison
H. C. Shipman & Co.
PILE DRIVERS, RAILWAY
F. H. Hopkins & Co.
PIPE, STEAM
Babcock & Wilcox
PIPE STOCKS
Butterfield & Co.
PIPE, WROUGHT, LEAD AND GALVANIZED
Steel Co. of Canada
PLANNERS
John Bertram & Sons Co.
Canada Machinery Corporation
PLATFORMS, STEEL
Standard Coupler Co.
PLOUGHS, CONTRACTORS'
F. H. Hopkins & Co.
PORTER
E. L. Drewry
PUMPS
F. H. Hopkins & Co.
PUMPS, CENTRIFUGAL
M. Beatty & Sons
F. H. Hopkins & Co.
R. D. Wood & Co.
PUNCHES AND SHEARS
Canada Machinery Corporation
PUTTY
Steel Co. of Canada
RAIL BONDS
Ohio Brass Co.
Elec. Railway Improvement Co.
RAIL BENDERS
Canadian Steel Foundries, Ltd.
RAIL JOINTS
Goldschmidt Thermit Co.
The Rail Joint Co. of Canada

RAILS, NEW

Algoma Steel Corporation
Dominion Iron & Steel Co.
J. J. Gartshore
F. H. Hopkins & Co.
RAILS FOR RELAYING
J. J. Gartshore
RAILWAY SUPPLIES
Franklin Railway Supply Co.
F. H. Hopkins & Co.
Rice Lewis & Son
The Hiram L. Piper Co.
REAMERS
Butterfield & Co.
REPLACERS, CAR AND LOCOMOTIVE
F. H. Hopkins & Co.
RIVETS
Steel Co. of Canada, Ltd.
RIVETTERS
Canadian Ingersoll-Rand Co.
ROCK CRUSHERS
F. H. Hopkins & Co.
ROPES, DERRICK
Dominion Wire Rope Co.
ROOFING, CAR
Franklin Railway Supply Co.
F. H. Hopkins & Co.
RUBBER GOODS
Can. Consolidated Rubber Co.
SANDERS, PNEUMATIC
Ohio Brass Co.
SAWS, HACK
Diamond Saw & Stamping Co.
SCOWS, DUMP AND DECK
M. Beatty & Sons
SCREW PLATES
Butterfield & Co.
SCRAPERS, WHEEL AND DRAG
F. H. Hopkins & Co.
SCREWS, WOOD AND MACHINE
John Morrow Screw and Nut Co.
Steel Co. of Canada
SEMAPHORE ARMS
Acton Burrows, Limited
SHEET PILE DRIVERS
Canadian Ingersoll-Rand Co.
SHIPS
Polson Iron Works
SIGNAL HOUSE NUMBERS
Acton Burrows, Limited
SIGNALS
Gen. Railway Signal Co. of Can.
The Hiram L. Piper Co.
SIGNS
Acton Burrows, Limited
SNOW PLOUGHS
F. H. Hopkins & Co.
SPIKES, RAILWAY, SHIP OR PRESSED
Nova Scotia Steel and Coal Co.
Steel Co. of Canada
SPlicing TUBES AND COMPOUNDS
Drew Electric & Mfg. Co.
Standard Und. Cable Co. of Can.
SPREADER CARS
F. H. Hopkins & Co.
SPRINGS
Canadian Steel Foundries, Ltd.
B. J. Coghlin & Co.
SPRINKLERS, ELECTRIC
Preston Car & Coach Co.
STAPLES
Steel Co. of Canada
STATION NAME SIGNS
Acton Burrows, Limited
STAYBOLT IRON
Taylor & Arnold
STAYBOLTS, FLEXIBLE
Flannery Bolt Co.
STAYBOLTS, LOCOMOTIVE
Flannery Bolt Co.
STAYBOLT TAPS
Butterfield & Co.
STEAM HAMMERS
John Bertram & Sons Co.

STEAM SHOVELS

M. Beatty & Sons
F. H. Hopkins & Co.
STEAMSHIP SIGNS
Acton Burrows, Limited
STEEL
Nova Scotia Steel and Coal Co.
STEEL FIRE BOX
Taylor & Arnold
Canadian Steel Foundries, Ltd.
STEEL FOR AXES
Canadian Steel Foundries, Ltd.
STEEL FOR SAWS
Canadian Steel Foundries, Ltd.
STEEL FOR TIRES
Steel Co. of Canada
STEEL SHAFTING
Nova Scotia Steel and Coal Co.
STEEL PLATES
Jas. W. Pyke & Co.
STEEL TOOL
Canadian Steel Foundries, Ltd.
F. H. Hopkins & Co.
STOKERS, MECHANICAL
Babcock & Wilcox
STRAINERS
Babcock & Wilcox
SUPERHEATERS
Babcock & Wilcox
Locomotive Superheater Co.
SWITCH TARGETS
Acton Burrows, Limited
SWITCHES
Canadian Ramapo Iron Works
TACKS
Steel Co. of Canada
TANKS AND TANK FIXTURES
F. H. Hopkins & Co.
Polson Iron Works
TAPS
Butterfield & Co.
TELEGRAPH AND TELEPHONE OFFICE SIGNS
Acton Burrows, Limited
TERMINALS, JUNCTION BOXES
Standard Und. Cable Co. of Can.
THERMIT
Goldschmidt Thermit Co.
TIE PLATES
Algoma Steel Corporation
B. J. Coghlin
Nova Scotia Steel and Coal Co.
Steel Co. of Canada
TICKET CASES
Canadian Office & School Fur. Co.
TIRES, STEEL
Jas. W. Pyke & Co.
TOOLS AND SUPPLIES
F. H. Hopkins & Co.
Pratt & Whitney Co.
TOOLS, CAST STEEL
Dominion Brakeshoe Co.
TOOLS, TRACK
John Bertram & Sons Co.
Canadian Steel Foundries, Ltd.
B. J. Coghlin Co.
F. H. Hopkins & Co.
TOOLS, PNEUMATIC
Canadian Ingersoll-Rand Co.
Independent Pneumatic Tool Co.
TRAMWAY EQUIPMENT
J. J. Gartshore
TRACK EQUIPMENT
Canadian Ramapo Iron Works
F. H. Hopkins & Co.
TROLLEY BASES
Allen General Supplies, Ltd.
Ohio Brass Co.
Trolley Supply Co.
TROLLEY CATCHERS
Allen General Supplies, Ltd.
Ohio Brass Co.
Trolley Supply Co.
TROLLEY GUARDS
Ohio Brass Co.
Trolley Supply Co.

TROLLEY RETRIEVERS

Allen General Supplies, Ltd.
Ohio Brass Co.
Trolley Supply Co.
TROLLEY WHEELS
Star Brass Works
TRUCKS, ELECTRIC CAR
Canadian Steel Foundries, Ltd.
TRUSSES, ROOF
Canadian Bridge Co.
Dominion Bridge Co.
TUBES, BOILER
F. H. Hopkins & Co.
TUBE CLEANERS
F. H. Hopkins & Co.
TURNBUCKLES
Canadian Steel Foundries, Ltd.
TURNTABLES
Canadian Bridge Co.
Dominion Bridge Co.
UPHOLSTERY, CAR
Du Pont Fabrikoid Co.
VALVES
Canadian Detroit Lubricator Co.
R. D. Wood & Co.
VALVES, ANGLE AND GLOBE
Ohio Brass Co.
VALVES, BRASS GATE
Ohio Brass Co.
VALVES, LOCOMOTIVE POP
Taylor & Arnold
VARNISHES
Berry Bros.
VENTILATORS, CAR
Automatic Ventilator Co.
VESSELS
Polson Iron Works
WASHERS
Steel Co. of Canada
WASTE
B. J. Coghlin Co.
WATER SOFTENERS AND PURIFIERS
Babcock & Wilcox
Dearborn Chemical Co. of Can.
WELDING
Goldschmidt Thermit Co.
L'Air Liquide Society
WHEELBARROWS
F. H. Hopkins & Co.
WHEEL GRINDERS
Griffin and Brinkerhoff
WHEELS, CAR
Association of Manufacturers of
Chilled Car Wheels
Canada Iron Foundries
Jas. W. Pyke & Co.
WHEELS, LOCOMOTIVE
Canada Iron Foundries.
WHITE LEAD
Carter White Lead Co.
Steel Co. of Canada
WIRE AND WIRE ROPE
Dominion Wire Rope Co.
WIRE, BARE COPPER
Standard Und. Cable Co. of Can.
Steel Co. of Canada
WIRE, BRASS, IRON AND STEEL
Steel Co. of Canada
WIRE, INSULATED COPPER
Standard Und. Cable Co. of Can.
Steel Co. of Canada
WIRE GOODS, BRIGHT
Steel Co. of Canada
WIRE, TELEGRAPH AND TELEPHONE
Standard Und. Cable Co. of Can.
Steel Co. of Canada
WIRE, TELEGRAPH AND TROLLEY
Standard Und. Cable Co. of Can.
WRENCHES, CAST STEEL
Dominion Brakeshoe Co.
YACHTS
Union Iron Works

The Imperial Guarantee and Accident Insurance Co.

of Canada

Imperial Protection Accident and Sickness Insurance
Guarantee Bonds Plate Glass and Automobile Insurance

A Strong Canadian Company

Head Office, 44 King St. W., Toronto, Ont.

Branch Offices:

Montreal, Que., Canada Life Bldg. Winnipeg, Man., Merchants Bank Bldg. Calgary, Alta., Canada Life Bldg. Vancouver, B.C., 516 Pender St. W.

Alphabetical List of Advertisers

A	
Algoma Steel Corporation	23
Allen General Supplies, Ltd.	50
Arnold Co.	79
Association of Manufacturers of Chilled Car Wheels	—
Automatic Ventilator Co.	22

B	
Babcock & Wilcox	20
Beatty, M. & Sons, Co.	78
Berry Bros.	12
Bertram, John & Sons, Co.	1
Bradstreet Company	77
Brown Hoisting Machinery Co. ..	8
Buffalo Brake Beam Co.	19
Burrows—Acton Burrows, Ltd. ...	76
Butterfield & Co.	78

C	
Canada Iron Foundries, Ltd.	19
Canada Machinery Corporation ..	3
Canadian Brakeshoe Co.	82
Canadian Bridge Co.	82
Canadian Bronze, Ltd.	25
Canadian Consolidated Rubber Co.	26
Canadian Detroit Lubricator Co.	80
Canadian Fairbanks-Morse Co. ..	13
Canadian Government Railways ..	84
Canadian Ingersoll-Rand Co.	14
Canadian National Carbon Co.	22
Canadian Northern Railway	12
Canadian Office & School Furni- ture Co.	82
Canadian Pacific Railway	79
Canadian Ramapo Iron Works ..	75
Canadian Steel Foundries, Ltd. ...	2
Canadian Westinghouse Co.	2
Canuck Supply Co.	7
Carter White Lead Co.	74
Chicago Car Heating Co.	82
Coghlin, B. J., Co.	20
Commercial Acetylene Co.	73
Consolidated Car Heating Co. ...	82

D	
Date, John	78
Dearborn Chemical Co of Canada ..	13
Dennison, H. J. S.	79
Diamond Saw & Stamping Works ..	72

Dominion Brakeshoe Co.	76
Dominion Bridge Co.	77
Dominion Iron & Steel Co.	21
Dominion Iron & Wrecking Co. ...	22
Dominion Steel Foundry Co.	82
Dominion Wire Rope Co.	10
Drew Electric & Mfg. Co.	71
Drewry, E. L., Ltd.	78
Duner Co.	73
Du Pont Fabrikoid Co.	11

E	
Eastern Car Co.	6
Electric Railway Improvement Co.	21

F	
Fairmont Gas Engine & Ry. Mo- tor Car Co.	80
Flannery Bolt Co.	16
Franklin Railway Supply Co. ...	17

G	
Galena-Signal Oil Co.	4
Garlock Packing Co.	74
Gartshore, J. J.	79
General Ry. Signal Co. of Canada ..	85
Goldschmidt Thermit Co.	18
Grand Trunk Railway	18
Griffin & Brinkerhoff	78

H	
Hart-Otis Car Co.	10
Hopkins, F. H. & Co.	10
Hunt, Robert W. & Co.	79
Hunt-Spiller Mfg. Corporation. ...	73

I	
Imperial Bank of Canada	77
*Imperial Guar. & Acc. Ins. Co. ...	83
Independent Pneumatic Tool Co. ...	24
International Correspond. Schools ..	25
International Nickel Co.	25

J	
Joliette Steel Co.	72

L	
L'Air Liquide Society	76
Lewis, Rice & Son	20
Locomotive Superheater Co.	23

M	
Marconi Wireless Telegraph Co. ...	75
Montreal Locomotive Works	15
Morrow, John Screw & Nut Co. ...	80

N	
National Steel Car Co.	86
Nicholson File Co.	14
Norton, A. O., Inc.	16
Northern Electric Co.	25
Nova Scotia Steel & Coal Co. ...	5

O	
Ohio Brass Co.	11
Ottawa Car Manufacturing Co. ...	78

P	
Pedlar People, Ltd.	15
Piper, The Hiran L., Co.	73
Polson Iron Works	17
Positive Lock Washer Co.	82
Pratt & Whitney Co. of Canada. ...	24
Preston Car and Coach Co.	73
Pyke, J. W. & Co.	24

R	
Rail Joint Co. of Canada	21
Roberts & Schaefer Co.	79

S	
Shipman, Harold C., & Co.	79
Sinclair, Angus	79
Standard Coupler Co.	82
Standard Underground Cable Co. of Canada	77
Star Brass Works	19
Steel Co. of Canada	9

T	
Taylor & Arnold	75
Terry & Tench Co.	79
Toch Bros.	77
Trolley Supply Co.	23

W	
Wood, R. D., & Co.	82

* Advertisements marked with an asterisk appear in alternate issues.

**Canadian
Government
Railways**

**4
Nationals**

for
Western Canada, Pacific Coast

NEW trains via **NEW** route, through **NEW** country
making **NEW** links
between the

ATLANTIC and PACIFIC

connecting HALIFAX - SYDNEY - ST. JOHN with

QUEBEC-COCHRANE-WINNIPEG

SHORTEST ROUTE - QUICKEST TIME

The **Western-National**

The **National Atlantic**

Through Observation Sleeping Cars

Dep. Quebec 2.00 p.m. Tue. Thur. Sat.	Dep. Winnipeg 5.15 p.m. Sun. Tue. Thur.
Arr. Cochrane 4.10 p.m. Wed. Fri. Sun.	Dep. Cochrane 7.15 p.m. Mon. Wed. Fri.
Arr. Winnipeg 4.30 p.m. Thur. Sat. Mon.	Arr. Quebec 9.10 p.m. Tue. Thur. Sat.

TORONTO-WINNIPEG

The **National** (west bound) Through Sleeping and Dining Car Service The **National** (east bound)

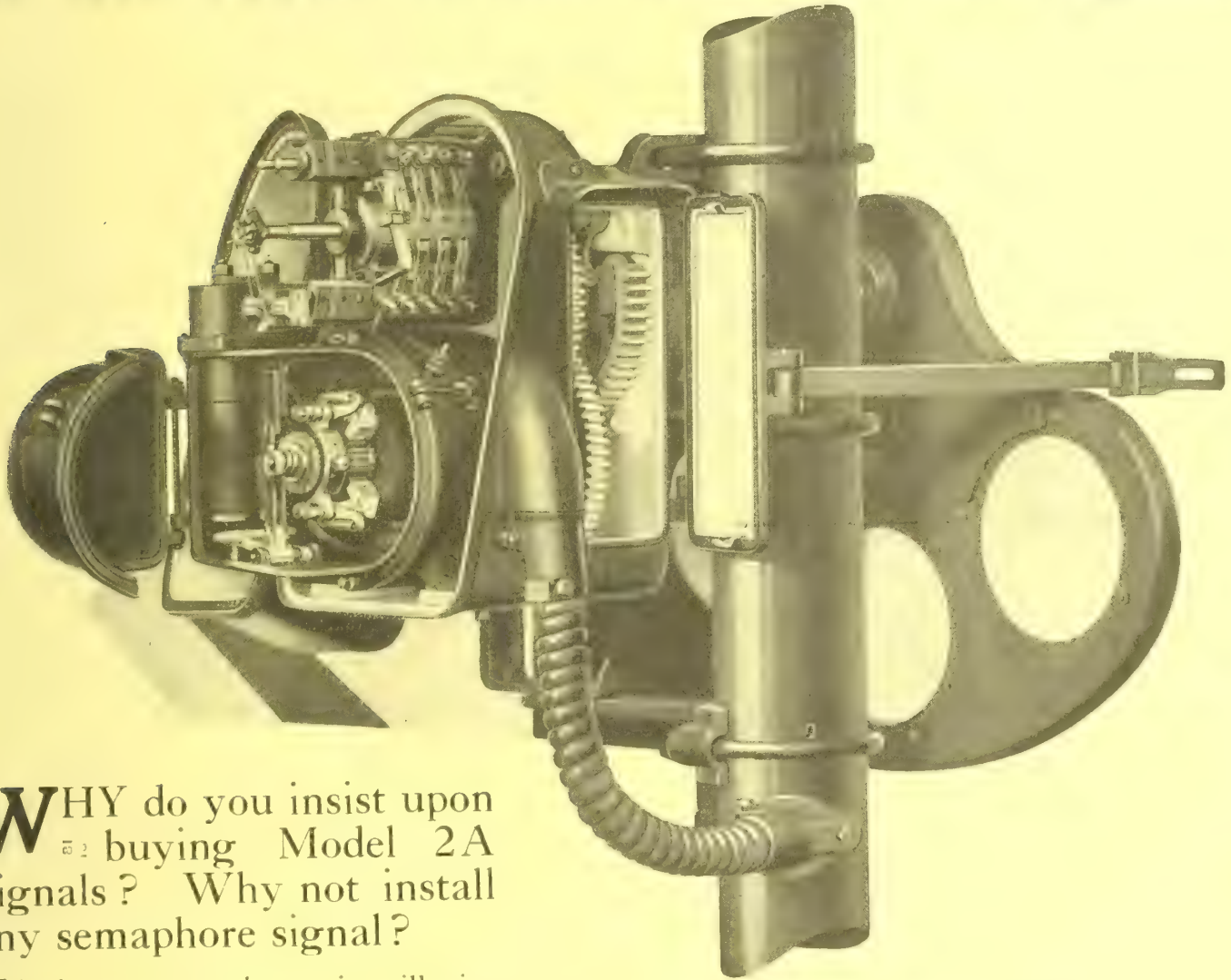
Dep. Toronto 10.45 p.m. Tue. Thur. Sat.	Dep. Winnipeg 5.15 p.m. Sun. Tue. Thur.
Arr. Winnipeg 4.30 p.m. Thur. Sat. Mon.	Arr. Toronto 12.05 p.m. Tue. Thur. Sat.

**Canadian
Government
Railways**

**4
Nationals**

for
Yukon - Alaska

CONFIDENCE—a commodity in the form of the Model 2A Signal



WHY do you insist upon buying Model 2A Signals? Why not install any semaphore signal?

It is because you know it will give good reliable service no matter what the weather conditions may be; because you can depend upon it in low-voltage operation, in electric interlocking and in alternating current service. It is because you have confidence in the signal, confidence that it will be on the job 24 hours each day through the sleet, snow, sunshine and rain of the passing seasons.

Look through the side door at the gears. You will notice the big teeth with ample clearances.

Open the deep door and examine the motor and circuit controller. The motor is oversized, large and substantial yet the operating and holding currents are low. The circuit controller parts are adequate in size and easy to inspect and adjust.

It is this simple design, these well-made parts and the substantial construction that make for reliable service and your confidence. When you buy Model 2A's, you buy a Signal that has the confidence of the signal world,

ASK FOR THE STORY OF THE MODEL 2A

"Safety First"

GRS

GENERAL RAILWAY SIGNAL COMPANY
OF CANADA LIMITED

GRS

Office and Works, Lachine, Quebec

Branch Office, Winnipeg, Manitoba



THIS plant was built especially to manufacture under the most favorable conditions, all classes of transportation equipment. The Engineering Staff, the Mechanics, the Machine and Tool equipment are the best that can be secured.

We build passenger and freight cars of all types required by leading railroad companies. We also supply Contractors' Dump Cars and Logging Car equipment.

We are prepared to submit designs and tenders on Steam and Railroad Passenger Cars, Sleeping Cars, Baggage and Express Cars, Suburban and Interurban Electric Cars, Freight Cars of all types and special transportation equipment.

Enquiries invited.

National Steel Car Company, Limited

Montreal Office :
SHAUGHNESSY BLDG.

Works and Operating Offices:
HAMILTON, CANADA

Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 225

TORONTO, CANADA, NOVEMBER, 1916

Subscription Rates, Page 454

Railway Springs



“DOUBLE ELLIPTIC SPRING with our improved eye and wrapper made from the full thickness of steel without rolling. This insures strength where it is needed and a smooth bearing necessary for an easy riding spring.”

Manufacturers of All Kinds of Springs

Write for Order Forms to

B. J. Coghlin & Co.

LIMITED

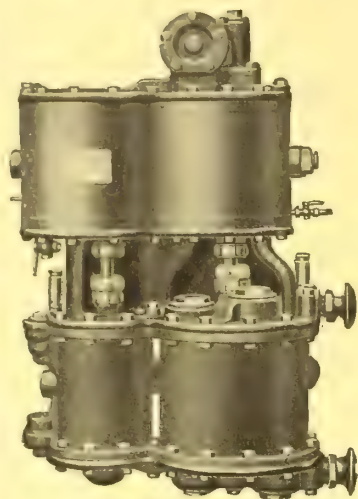
Office and Works:

Ontario Street East

Darling & Davidson

MONTREAL

Westinghouse



Westinghouse Cross-Compound
Compressor.

10½-inch Cross-Compound Air Compressor

The same compressor recognized as standard for railway air brake systems. It can be mounted on a boiler, or to any post, column or wall, or a stand is provided, making it easy to move the compressor about. Durability and low maintenance cost are among its strong features.

Ask nearest office for full particulars.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

TORONTO, Traders Bank Bldg. MONTREAL, 52 Victoria Sq. OTTAWA, Ahearn & Soper, Ltd. HALIFAX, 105 Hollis St. FT. WILLIAM, Telfer Bldg.
WINNIPEG, 158 Portage Ave. E. CALGARY, Grain Exchange Bldg. VANCOUVER, Bank of Ottawa Bldg. EDMONTON, 211 McLeod Bldg.

**You Men
Who Buy Equipment
Ought to Try**



REG. U. S. PAT. OFF.

The UPHOLSTERING and VESTIBULE CURTAIN material that "MAKES GOOD" with the user.

Place a Trial Order
Thereby doing your road a service.

Du Pont Fabrikoid Company

Canadian Factory, Toronto, Canada

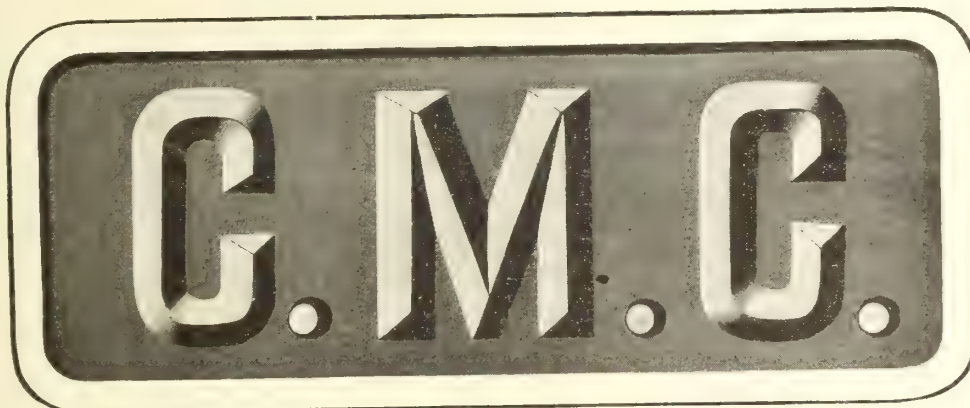
Du Pont Building, Wilmington, Del.

Wendell & MacDuffie Co., Railroad Department Representatives, 61 Broadway, New York



The Plant Behind

Trade



Mark

MACHINE TOOLS

The accuracy, strength and rigidity of our tools are insured by the use of the best materials and skilled workmanship with an up-to-date factory equipment.

Let us submit quotations on your next requirement.

For the convenience of the trade we have opened show rooms in Toronto, at Brock Avenue Subway, where a full line of our machinery can be inspected.

CANADA MACHINERY CORPORATION
LIMITED

GALT, ONTARIO

Builders of Machine Tools and Woodworking Machinery.

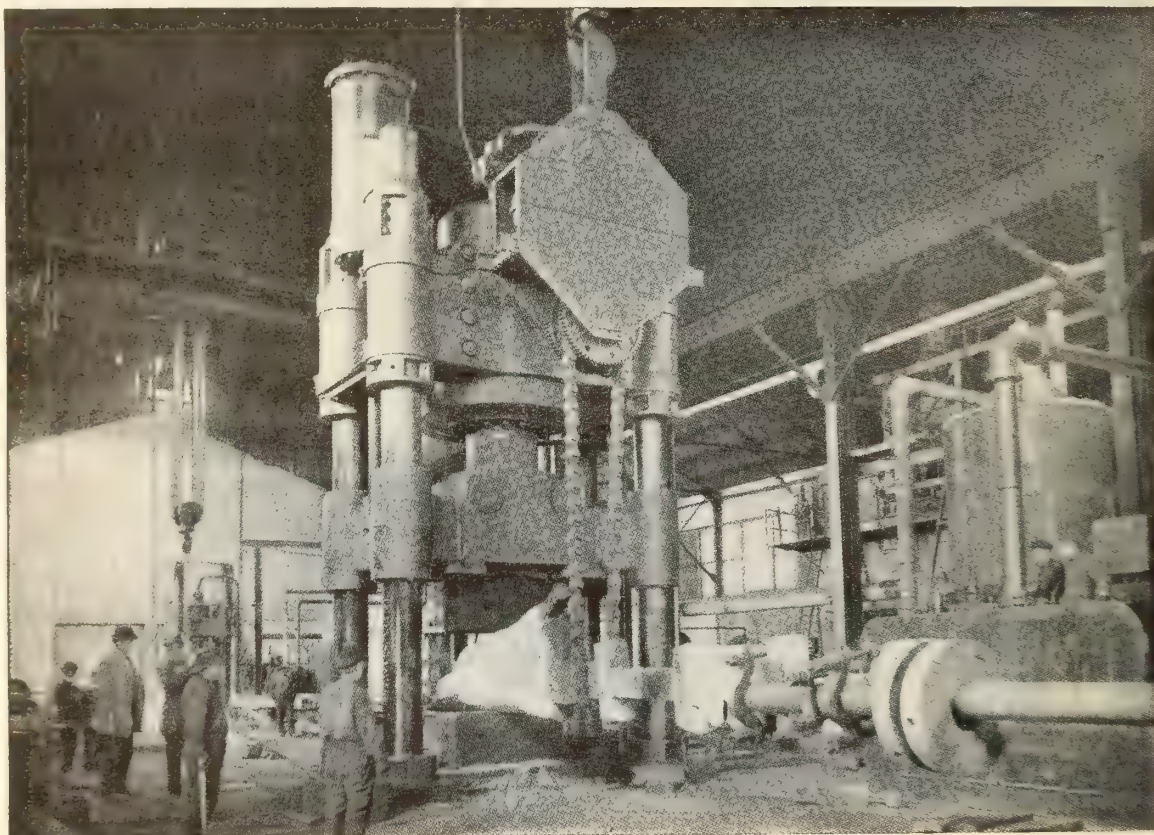
Nova Scotia Steel & Coal Company

LIMITED

Manufacturers of Steel for Shrapnel Shells and Admiralty Forgings

Only Company in Canada producing Steel Ingots by the "Harmet" liquid process

Can supply Forgings up to 40 Tons in weight to all Admiralty and Lloyd's Tests and Specifications



FORGING A RUDDER FRAME

Why "Harmet" Liquid Process Steel Ingots are Superior to Ordinary Steel Ingots:—

1. Prevention of cracks due to shrinkage; of internal stresses and resulting cracks and fissures.
2. Early cessation in the crystallization of the metal, and the production of fine crystallization without cleavage planes.
3. Lessening of segregation, i.e., reduction of tendency of carbon and other impurities to concentrate in the central and upper parts of the ingot.
4. Prevention of "pipes" or interior cavities, and thus preservation of absolute solidity in the ingot.
5. Improvement in physical properties.
6. Reduction in waste of ingot.

OUR modern Steam Hydraulic Forge Shop at New Glasgow, N.S., part of which is shown above, and our large Steel Plant at Sydney Mines, N.S., equal the very best in America.

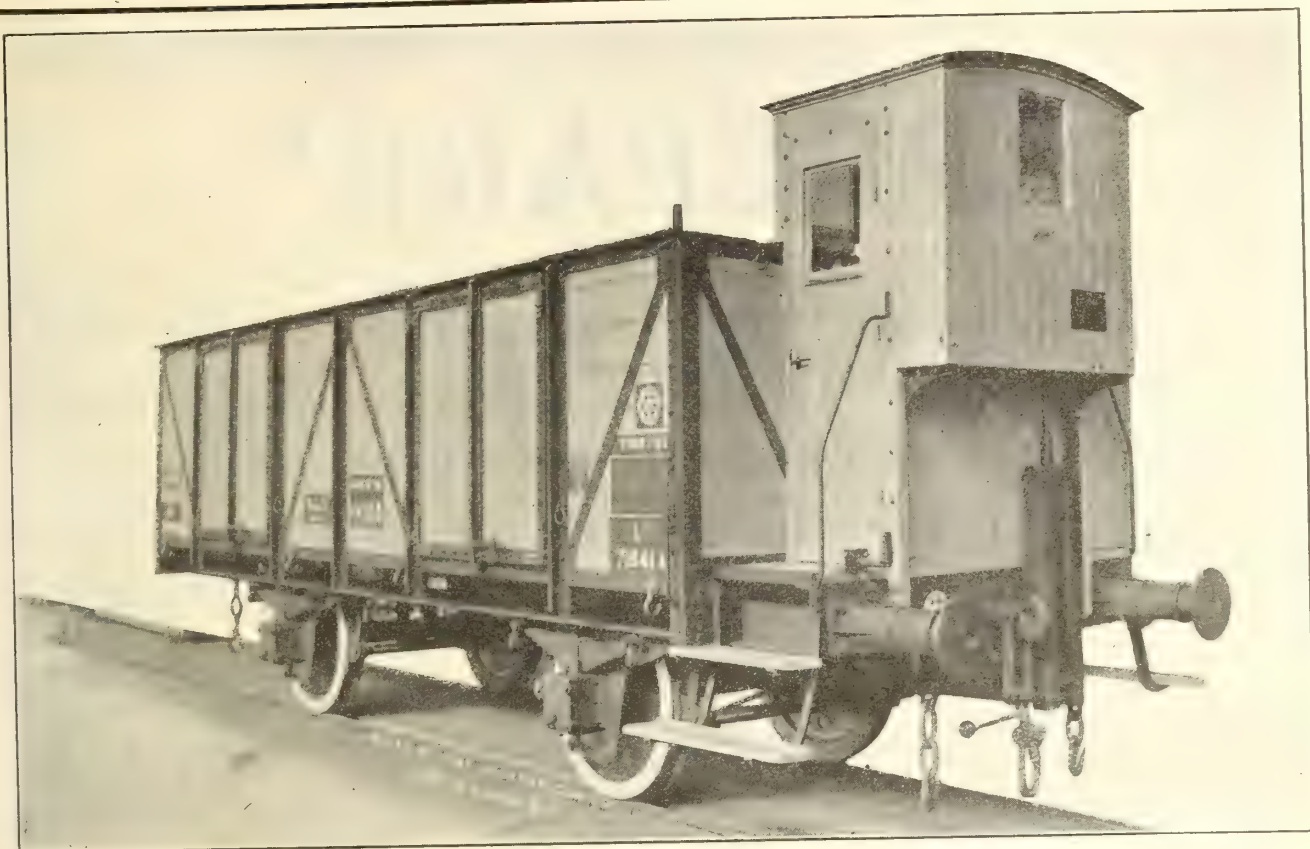
On the shortest notice, we can supply forgings of all shapes and sizes, made of ordinary or "Harmet" fluid compressed open-hearth steel, and satisfying the most severe specifications.

Our forges are modern in every respect—designed and installed after close study of the latest developments in all countries. Moreover, we produce the highest grades of steel by the most approved methods. It has always been the policy of "Scotia" to hold a position in the front rank of trade, and by the recent additions to plant, this policy has been maintained in a practical manner, bringing "Scotia's" equipment abreast of the best foreign forges.

For prices and full particulars, write to

Head Office, NEW GLASGOW, N.S.

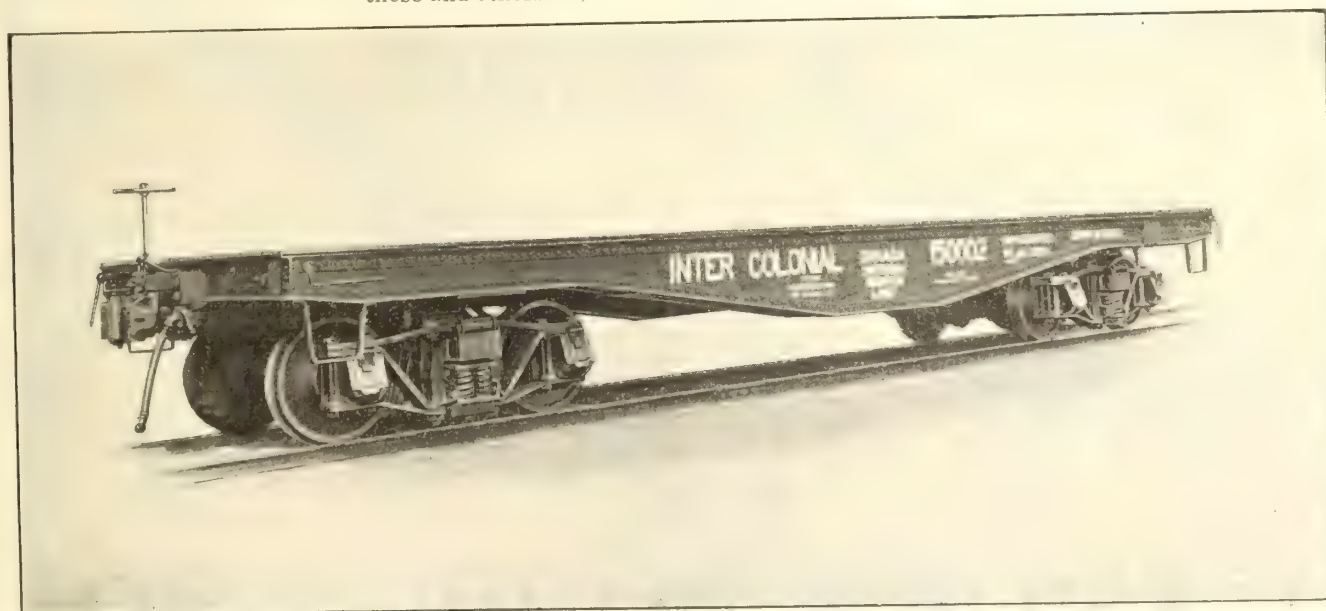
Western Sales Office, Room 14, Windsor Hotel, Montreal



ONE OF 2,000 GONDOLA CARS NOW UNDER CONSTRUCTION FOR THE FRENCH GOVERNMENT.

FREIGHT CARS TO FOREIGN ORDER

We have unexcelled water and rail shipping facilities for the export of freight cars of all types abroad or to United States markets. Our manufacturing capacity reaches to 40 cars per day. Although fully employed in filling and conducting negotiations for further foreign orders, our exceptional output facilities enable us both to take care of these and others in the order in which they are received.



75 TON SPECIAL PIT CAR FOR CANADIAN GOVERNMENT RAILWAYS.

FLAT CARS, CABOOSES, AND MINE CARS

We make a specialty of Flat Cars, Caboose and Mine Cars for both Home and Foreign Markets in Wood, Steel Frame or "All-Steel" and shall be pleased to quote against all capacity requirements and quantities.

Eastern Car Company, Limited

General Offices and Works, New Glasgow, N.S.

Montreal Office, Room 14 Windsor Hotel

“PREPARE”

A lot of stuff has been written and said about that word “PREPARE” and its mate “PREPAREDNESS” some right and some wrong—but this fact you cannot deny—The Winter is coming and you Must PREPARE.

If your flange joints on steam and water lines were packed last winter with ANCHOR SHEET PACKINGS they will need little or no attention.

BE SURE OF YOUR PACKINGS

Prepare so you will not need to Repair
USE ANCHOR

Tauril Sheet Packing

Black Fibre Sheet Packing—No. 424

White Fibre Sheet Packing—No. 425

Red Sheet Rubber Packing—No. 475

Red Sheet Rubber Packing—No. 415

Cloth Insertion Sheet “ —No. 420

Wire Woven Asbestos Sheet—No. 405

Gas Engine W.W. “ “ —No. 406

Hydroil Sheet for Oil, Water, Gas and Tar—tough as Rawhide } No. 402

Oil Proof Sheet Packing —No. 410

Wire Insertion Red Rubber—No. 400

CANUCK SUPPLY CO.
LIMITED

Montreal
Que.

Toronto
Ont.

Winnipeg
Man.

Vancouver
B.C.

Saving \$5.87 in One Half Hour's Time

THAT is exactly the saving effected by a 15 ton Brownhoist in one half hour's time in the shop yards of a large middle western shop, loading car wheels.

At 17½ cents an hour, hand labor may seem cheaper to use. That is what the railroad that is now using this Brownhoist used to think. On this road, loading a car with 115 car wheels, averaging 800 lbs. each, used to take 4 men, at 17½ cents an hour, *nine hours* to load a car from a car floor height platform.

Today, this railroad by using a 15 ton Brownhoist completes this job in exactly 30 minutes, at an operating cost of \$.43.

Equipped with a lifting magnet, six wheels are lifted at a time, and the operative speed of the Brownhoist, together with its safety features, make this saving possible.

This is but one of the many jobs this railroad has effected a big saving on, by using the Brownhoist.

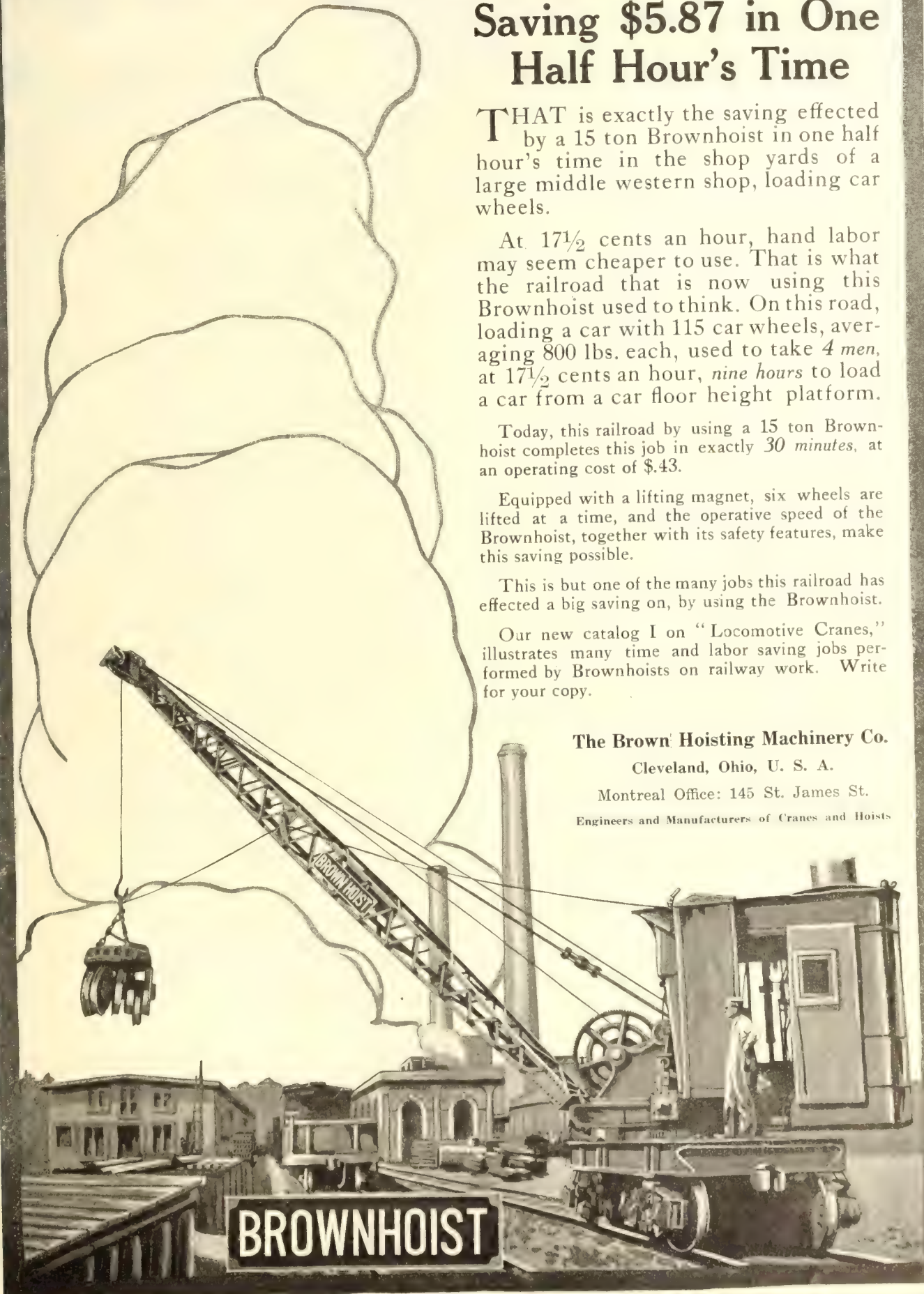
Our new catalog I on "Locomotive Cranes," illustrates many time and labor saving jobs performed by Brownhoists on railway work. Write for your copy.

The Brown Hoisting Machinery Co.

Cleveland, Ohio, U. S. A.

Montreal Office: 145 St. James St.

Engineers and Manufacturers of Cranes and Hoists





Quality



Service



Courtesy in Business



Fittingly framed and hanging in the Offices of one of the most important Public Service Corporations on this North American Continent is the following

'Did you say Please and Thank you?'

Broad minded men direct the destiny of that Corporation, men who know that public or private enterprises to be lastingly successful must operate for the public good.

Quality and Service are the two important factors in our business life today, but Courtesy is the door through which they must enter.

We are large producers of Hamilton Pig Iron and our output of Open Hearth Steel Blooms and Billets, Iron and Steel Bars of all shapes and size runs into enormous tonnage.

The products of our mills include practically everything that can be manufactured from Iron and Steel and these we distribute to thousands of satisfied customers.

Our business is an extensive one and a successful one. The World is our market: but our prosperity and success in the future, as in the past, depend upon the continued confidence, co-operation and good-will of the people we serve.

The Steel Company of Canada, Limited

HAMILTON TORONTO

MONTREAL WINNIPEG



Galena-Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office — 603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil

in Headlights, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and Correspondence Solicited.

S. A. MEGEATH,
PRESIDENT.



Electric Dynamic Interlocking, Hackensack—Erie R. R.

Safety and Reliability Keynotes Of Electric Interlocking

SAFETY and reliability are the keynotes of the efficiency of Electric Dynamic Interlocking. Dynamic Indication is correct in principle, while practice proves that its operation is un-failing—an absolute correspondence between lever and function operated.

Not only is the G. R. S. Interlocking System, using dynamic indication, thoroughly reliable, but it possesses a marked simplicity with a low cost both for operation and maintenance.

The G. R. S. Interlocking System is easily adapted to small and large interlocking plants, while its limitations as to size of interlocking and adaptability to varying traffic conditions have never been reached.

Eighty per cent. of all power interlocking now installed in the United States is G. R. S. Electric. Surely convincing assurance of its simplicity, safety, reliability and ultimate economy. Write us for facts, figures and photographs that prove.

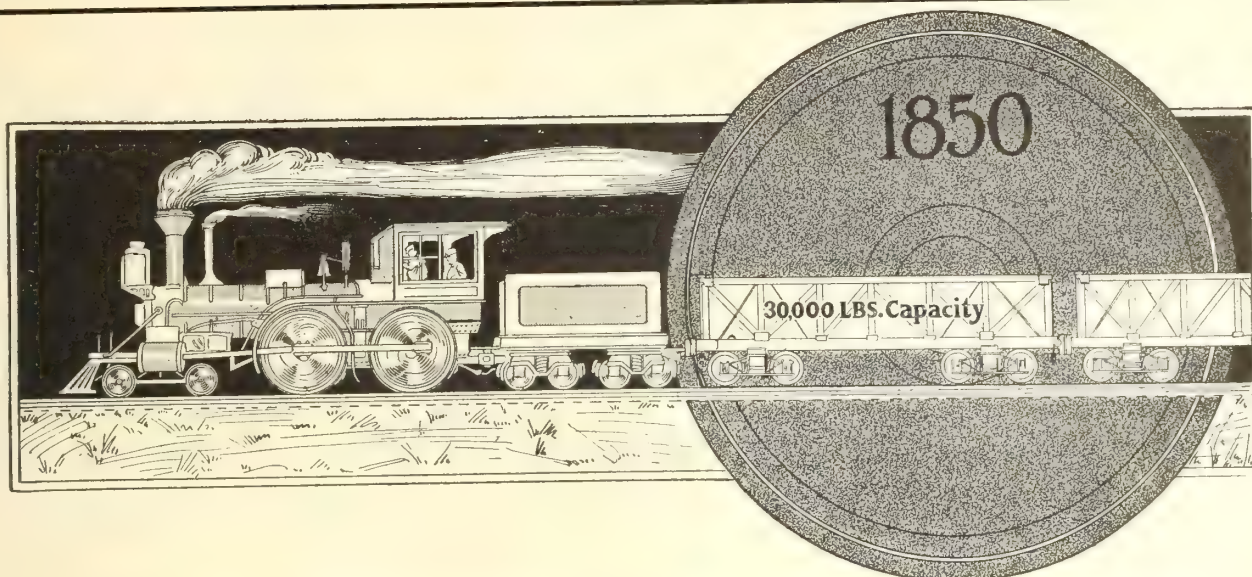


"Safety First"
GENERAL RAILWAY SIGNAL COMPANY
OF CANADA LIMITED



Office and Works, Lachine, Quebec

Branch Office, Winnipeg, Manitoba



The Wonderful Single Service Chilled Iron Wheel

Single Service means when a wheel is applied to a car it is allowed to run its life without any repairs whatever.

No Shop Investment in expensive lathes is required for re-turning, which is the case with other types of wheels.

And the manufacturers are so confident of the performance of the Chilled Iron Wheels that ordinary freight car wheels are guaranteed to yield a minimum service of

6 years for 625 lb. M.C.B. Wheels.

5 years for 675 lb. M.C.B. Wheels.

4 years for 725 lb. M.C.B. Wheels.

The actual guaranteed cost to the railroad per year for a 625 lb. M.C.B. Wheel is one-sixth of the cost price, less the scrap value of the old wheel, which is accepted as part payment for the new wheel.

The Master Car Builders Interchange rules base the cost of renewals upon the following:

	Chilled Iron.	Other Types.
Cost of new wheel	\$9.00	\$19.50
Less average scrap credit price.....	4.75	4.50
Net	\$4.25	\$15.00
Interest at 5 per cent. for one year .....	.21	.75

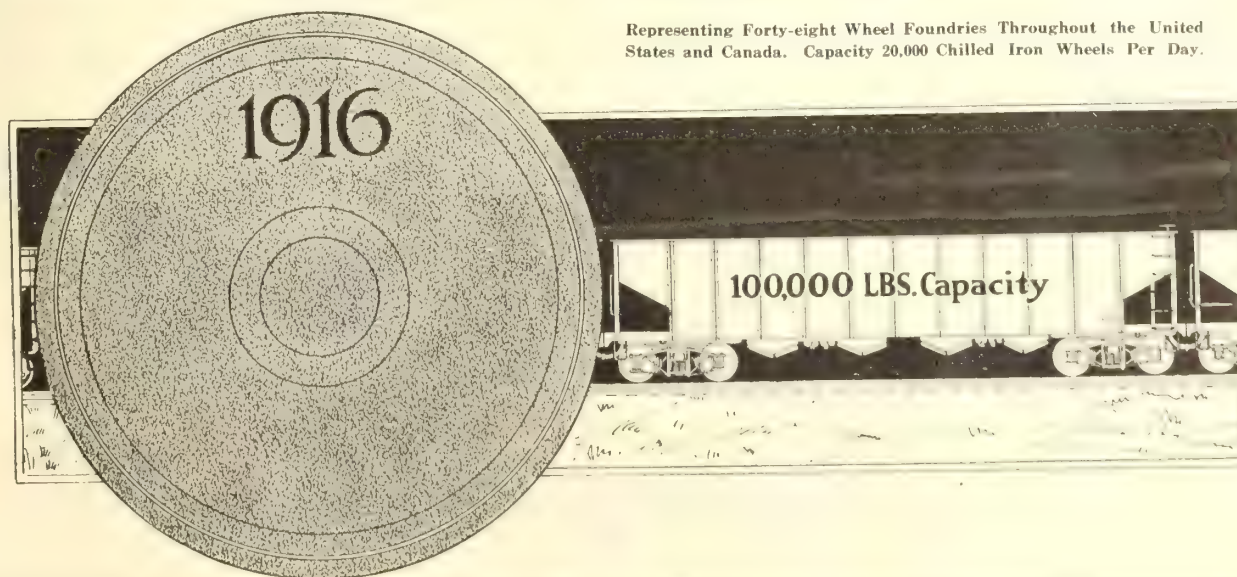
Difference in interest in favor of Chilled Iron Wheel54

As the average service of Chilled Iron Wheels is from 50 to 75 per cent. greater than the guarantee it will be seen that the increased interest charges alone of other types of wheels will more than absorb the renewal cost of the Chilled Iron Wheel.

Ninety-seven per cent. of the freight cars in use are equipped with Chilled Iron Wheels and service measures the standards. 25,000,000 Now Running.

Association of Manufacturers of Chilled Car Wheels 1228 McCormick Building, Chicago

Representing Forty-eight Wheel Foundries Throughout the United States and Canada. Capacity 20,000 Chilled Iron Wheels Per Day.





**"Follow the LEADERS"
BUY**

"DOMINION" Wire Rope

Which the Largest Industries are Using.

The Dominion Wire Rope Company, Limited
Montreal and St. Catharines

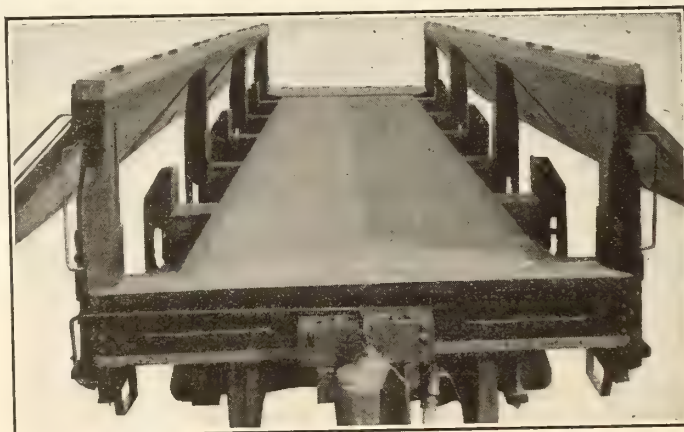
Side Ballasting With One Side Closed

The Latest in Ballast Cars

33 $\frac{1}{3}$ % More Door
Opening Area.

Less Stakes to
Obstruct the
Dumping Material.

No Clogging of the
Material or
Boulders between
the Plow and
Stakes.



Dumps Clean and
Quicker in any
Material.

No More Breaking
of Stakes or Cables.

The Car that will
give Maximum
Service with
Minimum Repairs.

—DESIGNED, BUILT AND PATENTED IN CANADA—

The HART-OTIS CAR CO., Limited, MONTREAL



**"MARION" Drag Line Machines,
Steam Shovels and R.R. Ditchers**

**"HAYWARD"
BUCKETS**

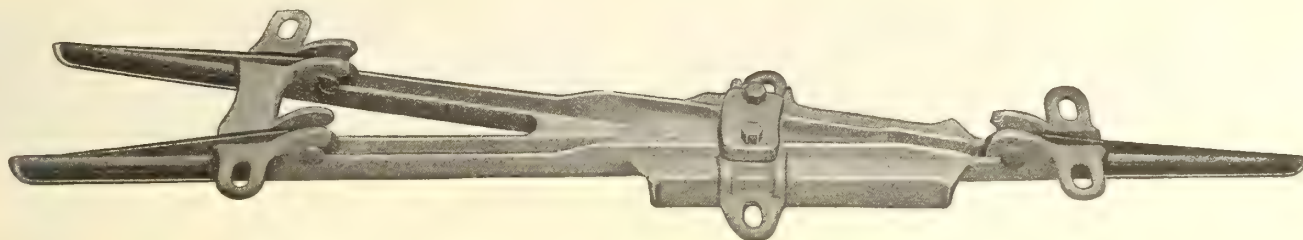
Indispensible for General Contractors' Work
SIMPLE—POWERFUL—QUICK ACTING



Branch:
St. Catharines, Ont.

F. H. Hopkins & Co

Head Office:
MONTREAL



Long Duty Trolley Frogs

The lineman spends little time putting up O-B Type E Trolley Frogs. Fitted with O-B Cam Tips which take most of the wear and are readily renewable.

The long legs protect the trolley wire from excessive side wear. Groove in pan steadies the wheel.

Listed in Catalog No. 16.

The Ohio Brass Company

MANSFIELD, OHIO



Canadian Northern All the Way

From the Laurentians to the Rockies

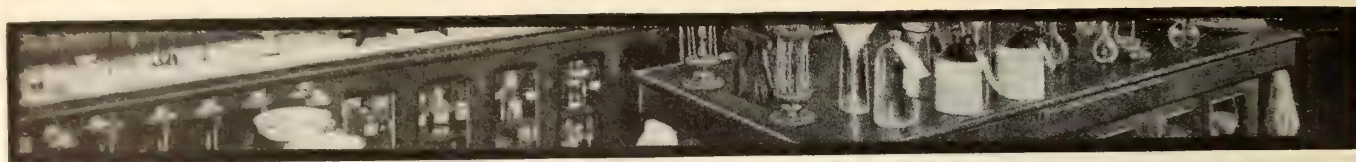
Serving Canada's National Playgrounds, including

Grand Discharge of the Saguenay: Laurentide National Park: Algonquin National Park: Muskoka Lakes: Georgian Bay Hinterland: Nipigon Forest Reserve: Quetico National Park: Vermillion Lakes: Jasper National Park: and Mount Robson National Park.

All Modern Equipment

Summer Tourist Fares

For Literature and information apply to General Passenger Dept., 68 King St. E., Toronto, Ont., 226 St. James St., Montreal, Que., or Union Station, Winnipeg, Man.



Superintendents of Motive Power, Fuel Agents, Officials in Charge of Operation

Should investigate the merits of the Dearborn Method of Water Treatment.

It is inexpensive—costs less than any other method.

It is effective—the waters requiring treatment are analyzed, and the treatment made to meet the actual requirements.

It accomplishes—the removal and prevention of scale—stops leaks—prevents corrosion—overcomes all foaming trouble.

The benefits—life of boiler tubes greatly lengthened—expense for boiler work reduced to minimum—mileage between boiler washings increased—large saving in fuel effected by having boilers free from scale. All the troubles due to bad water overcome and service generally improved.

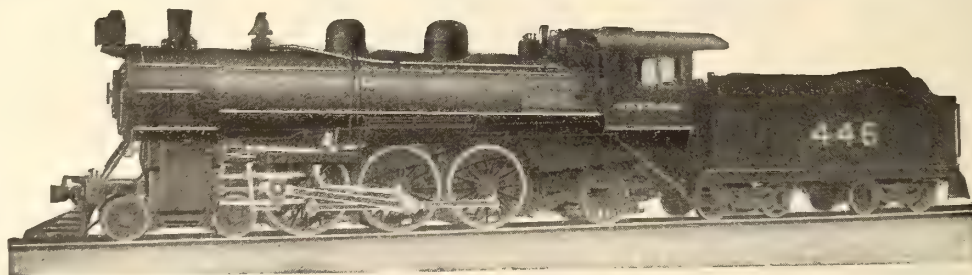
Experts furnished to instruct in application of treatment.

Now used on more than 100 American railways.

Dearborn Chemical Company of Canada, Limited

Office and Works: 1220-1230 Dundas Street, Toronto, Canada

Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE — INTERCOLONIAL RAILWAY

Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

Montreal Locomotive Works, Limited

DOMINION EXPRESS BUILDING, MONTREAL, CANADA



"LITTLE DAVID" Pneumatic Tools



have one third fewer parts than any other machine of equal capacity made which practically eliminates "trouble possibility" but they are sturdy, light and convenient.

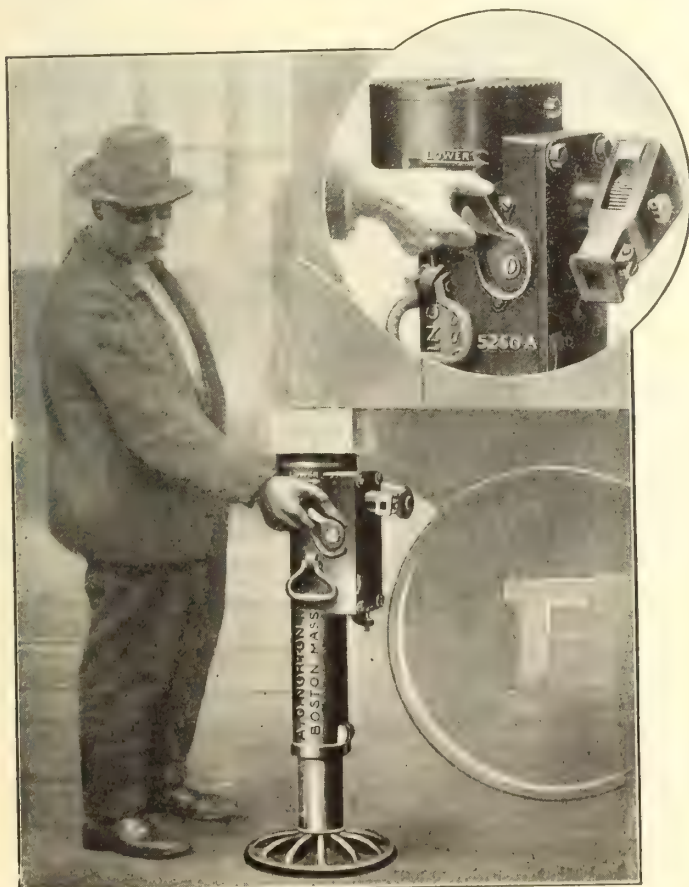
Ask for pamphlet 739-A.

Canadian Ingersoll-Rand Co., Limited

Commercial Union Bldg., MONTREAL, CANADA

Works: SHERBROOKE, QUE.

SYDNEY TORONTO COBALT TIMMINS WINNIPEG NELSON VANCOUVER



Don't Pump Your Jack Down

Lower the Load by "Pressing the Button"

The Norton Self Lowering Jack

is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

Send for Illustrated Catalogue No. 28.

A. O. Norton, Limited

Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents:
MUSSENS LIMITED


Montreal Toronto Winnipeg Cobalt Calgary
Vancouver

And in Addition— Freedom from Repairs

After you've given your road the strongest, most resistant culvert possible; after you've secured the lowest time and labor cost in laying; you get an added economy—Freedom from Repairs. The service rendered by

Pedlar's Culverts

exceed the most sanguine expectations of most railroad officials and civil engineers. They have withstood by test twenty-nine times the strain that would render iron piping useless. Once laid, you forget repairs and maintenance. Thirty years from time of laying they are practically as good as new.

Made of heavy gauge, deeply corrugated and galvanized anti-corrosive  Cannot rust, rot, pit or corrode, and are unaffected by frost or climatic con-

ditions. Shipped in sizes from 8 to 84 in. in diameter and in lengths up to 40 feet. Larger sizes and lengths to order.

The Culvert Reference Book No. 4 R.M. is full of valuable information and drainage tables. Free on request. Write!



THE PEDLAR PEOPLE, Limited

(ESTABLISHED 1861)

Executive Office and Factories, OSHAWA, ONT.

Branches :

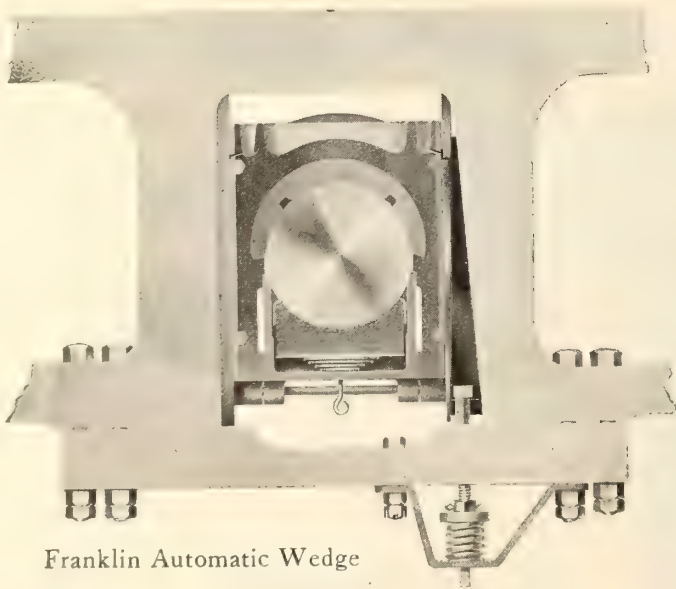
MONTREAL

OTTAWA

TORONTO

LONDON

WINNIPEG



Franklin Automatic Wedge

Driving Box Wedges in a New Light

It's new for driving box wedges to keep engines out of the shop four additional months.

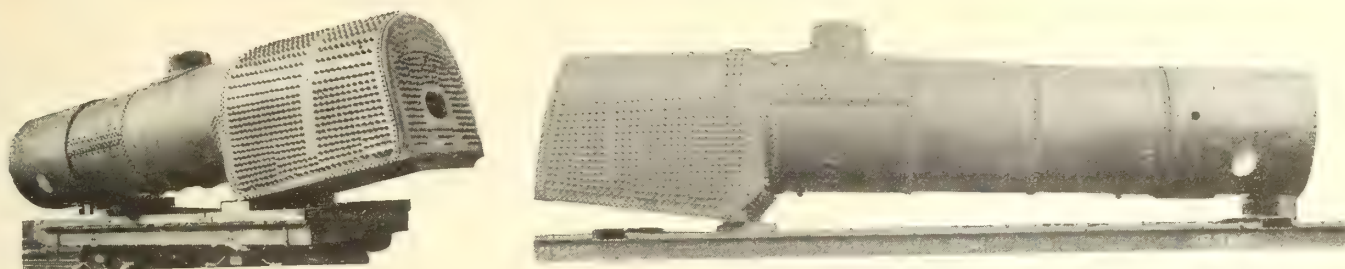
Usually they are to blame for premature shoppings. This wedge has a record of adding 13,500 additional miles between shoppings.

Franklin Railway Supply Company

30 CHURCH STREET, NEW YORK

332 So. Michigan Ave.
CHICAGO

625 Transportation Bldg.
MONTREAL



It is an Established Fact

That fireboxes of all types equipped with the Tate Flexible Staybolt show the lowest maintenance cost and highest earnings.

The Flexibility in the bolt serves to accomodate the relative expansion of plates under working operations of the fire box and boiler in a manner that has afforded less destruction to the sheets and seams than were found under conditions where fireboxes were rigidly stayed.

The Tate Flexible Staybolt is designed and made to give satisfactory results in the final measure of its usefulness, as an economic, safe and reliable factor in reducing the costs of firebox repairs and maintenance.

In use on all the prominent railroad systems of Canada.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.

RESULTS COUNT

That's Why 480 Railroad Shops Are Using Thermit

Thermit offers the only sure and reliable repair for locomotive frames and other heavy sections.

The superheated liquid Thermit steel is produced in bulk and poured all at once into a mold surrounding a broken section, resulting in the perfect amalgamation of the Thermit steel with the parts with which it comes in contact. The fact that those parts are first preheated, makes the weld doubly sure.

The operation of welding locomotive frames is easily accomplished, without removing the frame from position, and with very little dismantling, no matter if the frame be broken in the splice, jaw, next to the cylinder saddle, or at any other point. The engine is returned to service in from ten to twelve hours.

Hundreds of thousands of pounds of Thermit are being used annually by railroad companies in the United States and Canada.

There is only one reason for this, and that is that Thermit produces results and we all know that "results count."

Our pamphlet No. 2144 will be of interest.

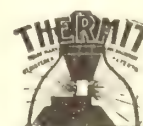
All Thermit and Thermit appliances are made in our Canadian shops.

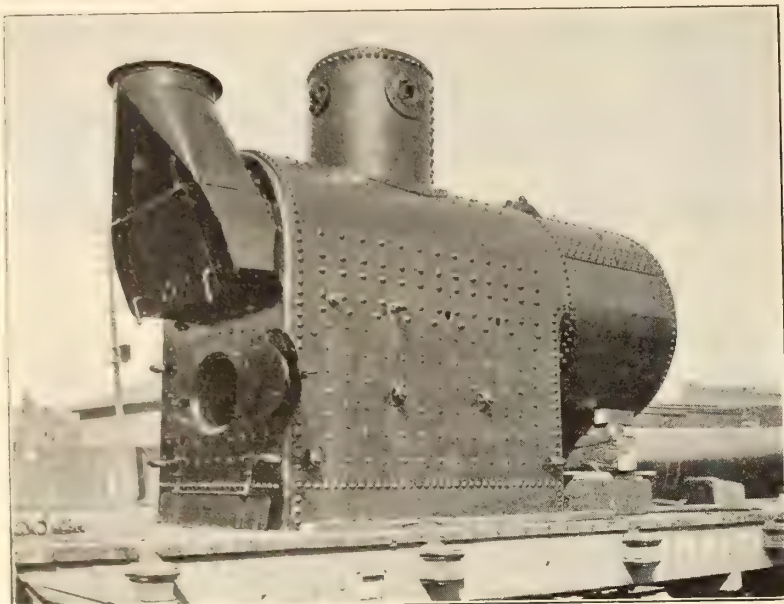
GOLDSCHMIDT THERMIT COMPANY

103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco. Equitable Bldg., 120 Broadway, New York

7300 So. Chicago Ave., Chicago





58-inch Square Fire Box Marine Boiler for 120 lbs. working pressure. This boiler has 46 tubes 3 ins. diam. x 8 ft. 6 ins. long, and three fire flues, two of which are 9 inches diam. and one is 16 inches diam. It was built for the Lakeside Dredging Company of Windsor, Ont., and was complete with grates, mountings, smoke box

Steel Shipbuilders Engineers and Boilermakers

Dredges, Hydraulic and
Dipper Type; Steel Steam-
ers, full Canal Size; Tugs,
Barges and Scows

Marine Engines and
Boilers, all Sizes

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto



CARTER'S

DRY

Red Lead - Orange Lead - Litharge

What are your requirements for Dry Red Lead, Orange Lead or Litharge? We are offering you a Canadian made product manufactured by a Canadian Company.

The best quality of Red Lead, Orange Lead or Litharge can be procured right here in Canada at the most favorable prices. The highest standards are strictly observed and your requirements can be filled completely without any delay, and to your entire satisfaction.

We manufacture special Red Lead and Litharge for Color Makers, Rubber Makers, and Varnish Makers, and are also manufacturers of Oxides, specially suited to Potters and Storage Battery Makers.

Do not let this opportunity go by but drop us a line and ask us for prices and further information regarding our products.

THE CARTER WHITE LEAD COMPANY of Canada, Limited

91 Delorimier Avenue, MONTREAL



Highlands of Ontario, Canada

The Home of the Red Deer and the Moose

OPEN SEASONS

DEER—November 1st to November 15th inclusive.

MOOSE—November 1st to November 15th inclusive In some of the Northern Districts of Ontario, including Timagami, the open season is from November 1st to November 30th inclusive.

Write for copy of "Playgrounds The Haunts of Fish and Game" giving Game Laws, Hunting Regulations, etc., to

J. QUINLAN,
Bonaventure Station,
MONTREAL, QUE.

C. E. HORNING
Union Station,
TORONTO, ONT.

CANADIAN STEEL FOUNDRIES LIMITED

STEEL CASTINGS - MANGANESE STEEL CASTINGS
GRAY IRON AND SEMI STEEL CASTINGS - BAR STEEL
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK

GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
LONDON (ENG) OFFICE —
— TRAFALGAR HOUSE, WATERLOO PLACE.

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL

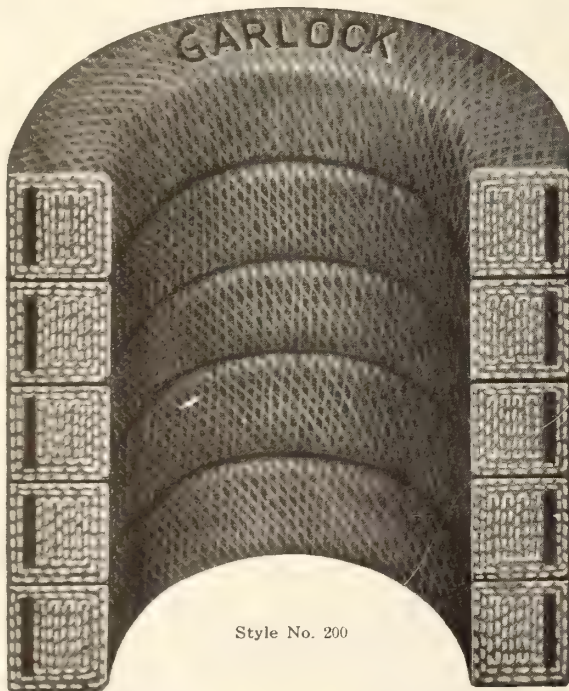
The Planfile

STEEL sections for rolled plans, especially adapted for railroad plans. Each compartment holding complete sets of blue prints or tracing of any subject, every plan in plain sight for instant reference.

The Steel Equipment Co., Ltd.
Ottawa, Ont.

FACTORY AT PEMBROKE.

Complete information sent on request.



Garlock High Pressure Piston Rod Packing

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.

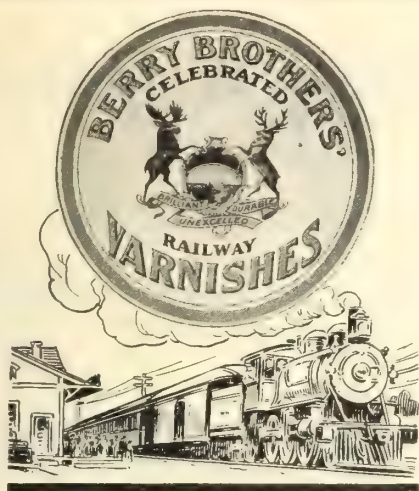
THE GARLOCK PACKING COMPANY

- Hamilton, Ontario



Branches :
Montreal, Que., 342 St. James St. East Toronto, Ont., Continental Life Bldg.
Winnipeg, Man., Galt Building





Appearance is an Outward Sign of Prosperity

Everybody forms a COMMERCIAL RATING of everybody else by APPEARANCES. It is ASSUMED that people who DO WELL will want to surround themselves with things that LOOK GOOD. This is what WE expect in OTHERS. Why should they not expect it of us? A small investment in DURABLE APPEARANCE—the kind that does not need attention again for a long time—is GETTING THE MOST OUT OF MONEY.

Berry Brothers' Railway Varnishes

Need no introduction to experienced railway-men. For nearly 60 years they have been the standard of railway varnish quality and their constantly increasing sale is undisputable testimony of their great efficiency.

If you have not already received a copy of our new catalog of Railway Varnishes, write us today, for the best catalog of its kind ever published.

BERRY BROTHERS
(INCORPORATED)
World's Largest Varnish Makers

WALKERVILLE

ONTARIO



Using Them For Fifty Years

Many firms have been using the "Famous Five" Files for half a century.

Their efficiency has become a tradition, because the constant improvement of their cutting qualities has kept abreast of the demands of modern shop practice.

Specify them when ordering.

They are:

Kearney & Foot

Great Western

American

Arcade

Globe

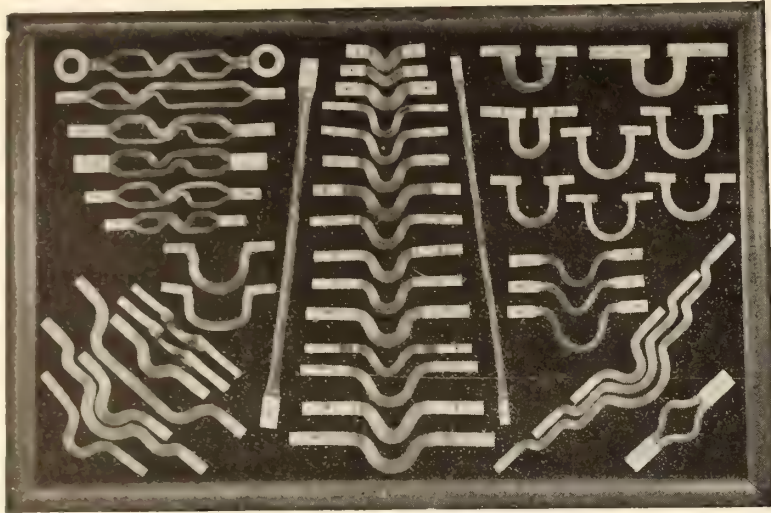
(MADE IN CANADA)

Nicholson File Company

Port Hope

(Dealers Everywhere)

Ontario



Electric Weld Rail Bonds

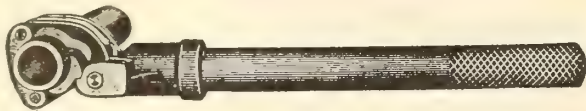
meet every condition.

Neither do they corrode at the terminals.

The Electric Railway Improvement Co.

Cleveland, Ohio

The Parmelee Pipe Wrench



Price List C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	3/8, 1/2, 3/4, 1 in.	\$5.00	\$2.25	3/8, 1/2, 3/4, 1 in. \$.75
20 in.	2 1/2	3/4, 1, 1 1/4, 1 1/2, 2 in.	7.50	2.50	3/4, 1, 1 1/4 in. 1.00 1 1/2, 2 in. 1.25
25 in.	3 1/2	1 1/2, 2, 2 1/2, 3 in.	7.50	3.00	1 1/2, 2, 2 1/2, 3 in. 1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Limited

Toronto, Canada

"The Toothless Wonder"

Designed Especially to handle pipes spaced closely as in coil work. No. 2 1/2 wrench illustrated requires but three-quarter inch space between pipes.

Positive Grip instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

Ratchet-like Action. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

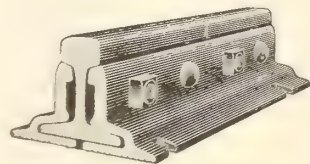
Can't Chew. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

Can't Crush. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.

The Rail Joint Company of Canada, Limited

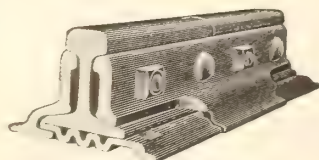
McGill Bldg., MONTREAL

36 Broad Street, London, E.C.



CONTINUOUS

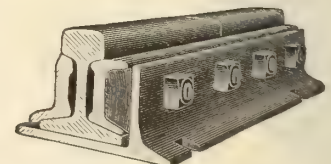
Continuous,
Weber, Wolhaupter and
100 p.c. Rail Joints.



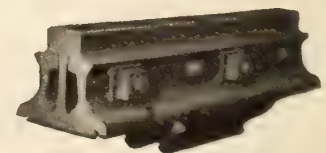
WOLHAUPTER

Standard—Insulated
Step—Frog and Switch
Protected by Patents.

Grand Prize, San Francisco, 1915.



WEBER



100 p.c.

Dominion Iron & Wrecking Company

LIMITED

Railway Equipment, Rails and Machinery

Dismantlers of BRIDGES, PLANTS, STEAMERS, MILLS
Dealers in IRON, STEEL, SCRAP METALS

General Offices: Transportation Building - - - MONTREAL, QUE.
QUEBEC ST. JOHN, N.B.

Dominion Iron & Steel Co., Limited

Manufacturers of

Basic Open Hearth Steel Rails

We will be pleased to have your enquiries for 1916 shipments

Head Offices
and Works

Sydney, Cape Breton, Canada

DURABILITY



You have a right to expect good service from the ignition batteries on your speeders.

Columbia Multiple Batteries give you all the service you expect and more besides.

Columbia Multiple Batteries are made in a variety of sizes and styles suitable for the various types of speeders.

They are waterproof and jar proof.

Only two binding posts; connected or disconnected in an instant.

And finally—

They bear the well known Columbia trade mark which means the best in batteries.

Canadian National Carbon Company, Limited

265 Adelaide Street West

Toronto, Ontario

ALGOMA STEEL CORPORATION LIMITED

STEEL RAILS
SPICE BARS
STEEL TIE PLATES



STRUCTURAL SHAPES
STANDARD MERCHANT
BARS

PIG IRON
BASIC & BESSEMER

BLOOMS BILLETS
& SLABS

SAULT STE. MARIE, ONT. CANADA.

Car Ventilation

Expert Advice is as needful in this as in other matters of Car Construction. Is not the experience of twelve years, devoted exclusively to this field, worth anything to you? We have it, and it is yours for the asking.

CAR VENTILATORS of all types at prices from \$1.50 up.

For information address

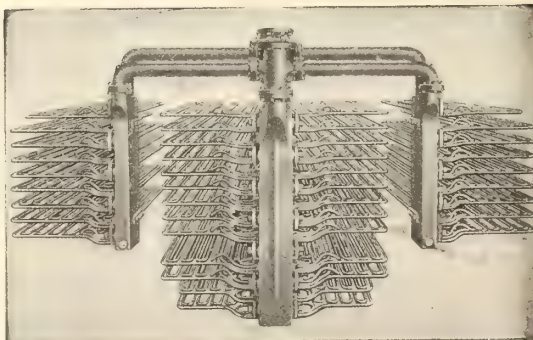
Automatic Ventilator Company

No. 2 Rector Street

New York, N.Y.

Fire Tube Marine Superheater -- Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler h.p. from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, New York, N.Y.

Peoples Gas Bldg., Chicago, Ill.

Jas. W. Pyke & Company, Limited

Iron, Steel and Metal Merchants

Locomotive, Driving, Engine and Tender Truck Axles, Passenger, Freight, and Electric Tram Car Axles—To Standard or Railway's own Specification.
 Staybolt and Engine Bolt Iron—Quality and Service Unexcelled.
 Steel Plates—Firebox, Flange and Tank Qualities.
 Structural Shapes—Beams, Channels, Angles, Tees, Zees, etc.
 Steel Billets and Forgings—of all descriptions.
 Locomotive Boiler and Superheater Tubes—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
 232 St. James Street,

Montreal

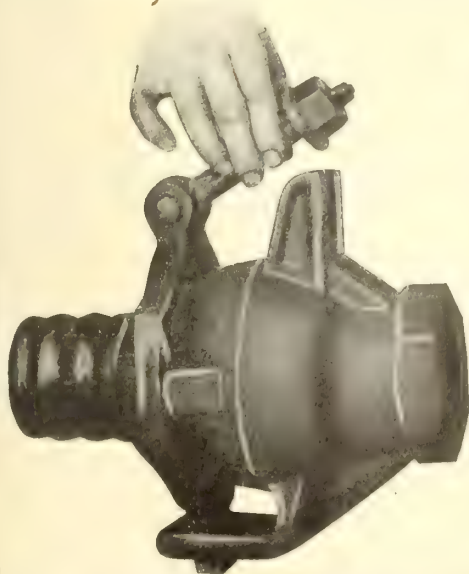
Are You in the Market for Trolley Catchers, Retrievers, Bases or Head Lights

We manufacture Knutson No. 5 Trolley Retriever, Knutson No. 2 Trolley Retriever, The Ideal Trolley Catcher, The Simplex Trolley Base, The Peerless No. 10 Roller-bearing Trolley Base, The Peerless Check Valve, The Peerless Junior Head Light, The Perfect Head Light, The Hollis Safety Fender, No. 3 Detachable Fender.

Write our Canadian Representatives Allen General Supplies, Limited they will be pleased to give you complete information as to any of the above as well as our other lines.

Trolley Supply Company, Canton, Ohio

Address all correspondence to Allen General Supplies, Limited, 205 Yonge St., Toronto



Star Tender Hose Coupler

The Star Hose Coupling has been found to be very useful in roundhouses and buildings, where a quick and reliable coupling is necessary to save time; for such purposes as boiler washout lines, steam lines, water lines, air lines and the application of the Star Coupling to existing lines can be made at a very small expense.

TAYLOR & ARNOLD, Limited

MONTREAL

WINNIPEG

Everything
In
Rubber



Made
In
Canada

Quality and Variety
Plus
Value and Service
Give
Absolute Satisfaction

If you have not proved it, write to our nearest Branch or direct to Head Office for anything you may need in Rubber and see for yourself how we aim to serve and please you.

Canadian Consolidated Rubber Co., Limited
Head Office, Montreal, P. Q.

Branches at Halifax, N.S., St. John, N.B., Moncton, N.B., Quebec, Que., Ottawa, Ont., Toronto, Ont., Hamilton, Ont., Brantford, Ont., London, Ont. Kitchener, Ont., North Bay, Ont., Fort William, Ont., Winnipeg, Man., Brandon, Man., Regina, Sask., Saskatoon, Sask., Calgary, Alta., Edmonton, Alta., Vancouver, B.C., and Victoria, B.C.

Canadian Railway and Marine World

November, 1916.

Railway Location and Construction Through Muskeg Swamps.

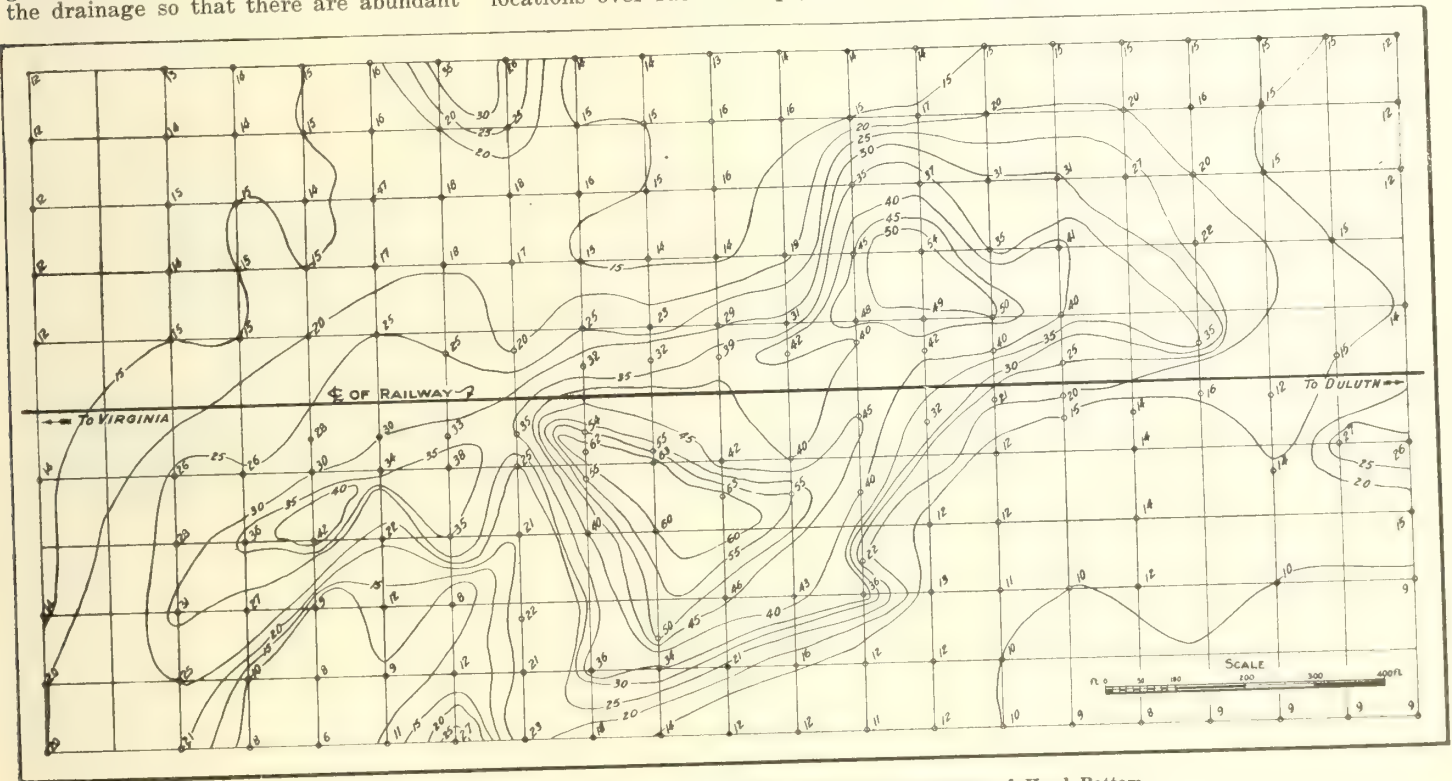
By J. L. Pickles, Chief Engineer, Duluth, Winnipeg & Pacific Railway.

In locating roads over muskeg country, it is well to have a slight knowledge of the geology and the accepted theory of this formation. When the continental ice cap receded, it left vast quantities of glacial drift, composed of all sorts of material, varying in size from huge boulders weighing several hundred tons down to an impalpable powder forming clay. It is owing to this glacial invasion that the surface differs from the normal type in the minor topography and drainage. The whole plateau is deeply covered with glacial deposits, which have disarranged the drainage so that there are abundant

tions over these swamps that a thorough investigation should be made to determine contours of the hard bottom. We are too apt to take it for granted that the muskeg is but of a shallow formation, and trust to our road to be supported by the decayed vegetation rather than to accept the country surrounding these swamps, which is invariably covered with very thick vegetation. There is a great temptation to run our lines through the open country, in order to avoid a more difficult location on higher ground, in which the regularities are apparent. In locations over such swamps, it would be

doubtedly cause a great deal of criticism of his location, it would in some instances be a very great economy to do so.

I have made a study of the vegetation covering these swamps, with a view to ascertain if the growth was in any way indicative of the depth of the swamp. Generally speaking, it will be found that the smaller the tree growth and the more luxuriant the growth of the moss, the deeper will be the muskeg, but I have not as yet been able to ascertain anything more than a very approximate depth by such observations. The areas found void of tree growth should be re-



Miller Trunk Swamp, Feb. 1913. Contour Map Showing Conditions of Hard Bottom. Contour interval 5 ft. A depth less than 15 ft. supports traffic.

lakes, swamps and muskegs. Overlaying the glacial drift and under the swamp is usually found a stratum of impervious blue clay. As the ice melted, the materials were deposited, as an over-mantle of glacial drift, in moranes and in a very irregular manner, so that the topography of the country did not conform to the usual regularity presented by country formed by the erosive action of water. Huge quantities of ice were left embedded, afterwards melting, which formed large circular depressions or kettles. These became filled with water in form of lakes. The muskeg is of recent formation and is composed of decayed moss and various vegetable growth, which, by constant decay and renewal, gradually filled the depressions until we have what are known today as muskeg swamps.

As the added formation does not bear the regular contours usually found, it is very necessary in determining loca-

well for the engineer to proceed in the same manner as he would in locating over frozen lakes, and not trust the moss covering to support his line until he has thoroughly tested the same and ascertained what the bearing value of the soil is. In testing it will quite often be found that the surface is floating and the lake is not yet filled to the bottom. In such cases disaster is sure to follow unless adequate measures are taken to support the track. Another weakness that is often met with in such locations is the desire to obtain long tangents. It would be much better to introduce curvature in the alignment, in order to keep the location over shallow swamps, than to produce long tangents crossing over deep pockets. It would, of course, take a great deal of stamina on the part of any engineer to introduce apparent reversed curves on what appears to be level ground; and while this would un-

garded with suspicion, as this usually indicates deep and recent formation and quite often indicates floating bog.

It has been found in some of the lines already constructed, that had adequate soundings been made previous to final locations, a great deal of money would have been saved over what was necessarily spent to bring the road up to the required standard after operation was begun. As a concrete example, I would like to draw attention to the accompanying plan. As constructed, the line at this point was first heavily corduroyed, which broke through before traffic was started. Soundings taken on centre line after failure showed a depth of about 60 ft. to apparently hard bottom. About 83,000 yards of material were required to again bring the track above water. A great deal of time and money was lost, due to the failure of the surface. All of this would have been avoided had adequate

soundings been taken during the location, and the time and money lost in this one instance would have been much more than required for adequate sounding of the entire line.

In railway construction over muskeg swamps, the methods in general use are: (1) To follow out the usual form of construction, laying the track directly on the surface and afterwards ballasting up to grade. (2) To corduroy or crossway the surface, using long timbers, laying them in alternative layers parallel and transverse to the line, afterward bringing the track to grade with ballast. (3) By excavating ditches along the side of the line, using the material excavated to form embankment. (4) The use of sawdust, cinders, or other light material, floating the line over and depending on the buoyancy of the muskeg for support. (5) Fill to the bottom with logs and timber. (6) Fill with excavated material. (7) By bridging. (8) Where considerable embankment is to be carried over the swamp, piles have been driven on about 4 ft. centres capped with grillage and the fill constructed on the same.

Drainage is often resorted to with very beneficial results. However, in many instances, where deep muskeg is encountered, it is not practical to drain, due to large lakes in the vicinity and excep-

Birthdays of Transportation Men in November.

Many happy returns of the day to—

F. W. Alexander, A.M.Can.Soc.C.E., Division Engineer, Alberta Division, C.P.R., Calgary, born at Fredericton Jct., N.B., Nov. 22, 1878.

J. O. Apps, General Baggage Agent, C.P.R., Montreal, born at Tara, Ont. Nov. 9, 1877.

A. B. Atwater, Assistant to President, lines west of Detroit and St. Clair Rivers, G.T.R., Detroit, Mich., born at Sheffield, Ohio, Nov., 1845.

H. E. Beasley, General Superintendent, Esquimalt and Nanaimo Ry., Victoria, B.C., born at Hamilton, Ont., Nov. 10, 1862.

O. H. Becker, District Freight Agent, C.P.R., Portland, Ore., born in Norfolk County, Ont., Nov. 19, 1873.

C. C. Bonter, General Baggage Agent, Canada Steamship Lines, Ltd., Montreal, born at Toronto, Nov. 13, 1884.

G. B. Burchell, General Manager, Colonial Coal Co., North Sydney, N.S., born at Sydney, N.S., Nov. 1, 1877.

J. R. Cameron, Assistant General Manager, Canadian Northern Ry., Winnipeg, born at Truro, N.S., Nov. 5, 1865.

F. H. Clendenning, Division Freight

Agent, District 1, National Transcontinental Ry., Quebec, Que., born at St. Jerome, Terrebonne County, Que., Nov. 16, 1887.

H. E. Haanel, Trainmaster, District 1, Saskatchewan Division, C.P.R., Regina, born at Cobourg, Ont., Nov. 2, 1880.

Grant Hall, Vice President and General Manager, Western Lines, C.P.R., Winnipeg, born at Montreal, Nov. 27, 1863.

John L. Hodgson, General Car Foreman, National Transcontinental Ry., Transcona, Man., born at Simcoe, Ont., Nov. 15, 1858.

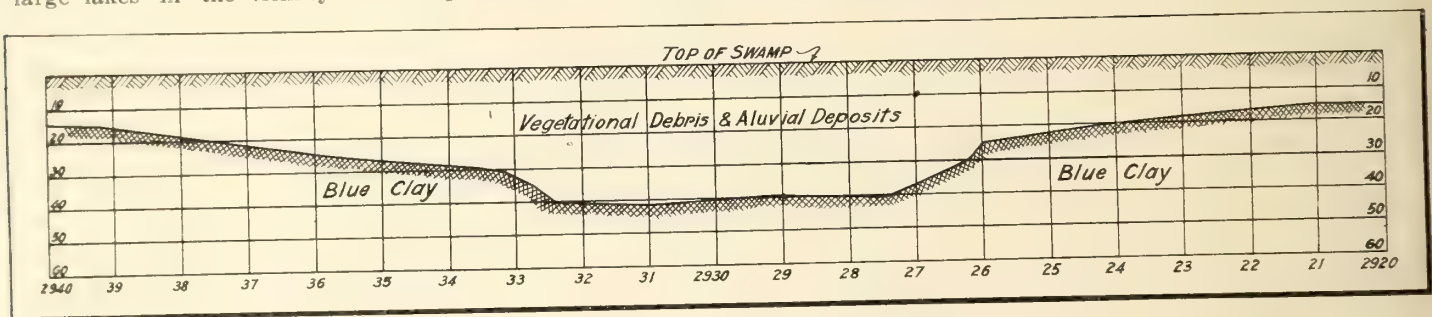
W. M. Hood, Travelling Passenger Agent, Canadian Northern Ry., Toronto, born at Harrow, Ont., Nov. 25, 1872.

N. B. Jones, Car Foreman, C.P.R., Kenora, Ont., born at St. John, N.B., Nov. 9, 1869.

W. E. Ladley, Superintendent of Motive Power, Reid Newfoundland Co., St. John's, Nfld., born at Leeds, Eng., Nov. 1875.

J. McGillivray, Receiver and Manager, Inverness Ry. and Coal Co., Inverness, N.S., born at Nairn, Scotland, Nov. 13, 1867.

J. McMillan, Manager of Telegraphs,



Miller Trunk Swamp, Feb. 1913; Profile of hard bottom.

tionally heavy expense required due to great length of ditches which it would be necessary to construct. Ditches cut in muskeg are prone to close and it is a source of expense to keep them open. And then again it will usually be found that there is no place to stop the ditch without carrying it to an unreasonable distance. While such ditches are always more benefit to the surrounding country than to the roads constructing them, they invariably bring on a system of suits in which the company is usually the loser. It is for this reason alone that many of the swamps in the northern part of Minnesota are not drained.

Whatever the construction decided upon, it must be borne in mind that a good foundation must be obtained, otherwise there will be a constant source of expense and trouble from rail running, causing broken rails, derailments, and a constant settlement, which will result in very heavy maintenance charges.

In locations over this country, it is well to always keep the grade as near the surface as good drainage will permit, in order not to overload the surface by the weight of heavy embankments, which are apt to break through the surface and sometimes will cause rupture through the underlying stratum into the substratum, which is of an older formation but not yet solidified sufficiently to carry the increased load.

Swamps are like wrecks—there are no two of them alike, and they are very good things to avoid if at all possible.

Agent, B.C. Coast Service and Ocean Steamship Lines, C.P.R., Vancouver, B.C. born at Montreal, Nov. 9, 1881.

F. Conway, City Freight and Passenger Agent, C.P.R., Kingston, Ont., born at Ernestown, Ont., Nov. 19, 1850.

W. L. Crighton, Advertising Agent, Canadian Government Railways, Moncton, N.B., born at Derby, Eng., Nov. 9, 1871.

W. R. Devenish, A.M.Can.Soc.C.E., Superintendent, District 3, Intercolonial Ry., Moncton, N.B., born in County Tipperary, Ireland, Nov. 21, 1882.

A. C. Douglas, acting Assistant General Purchasing Agent, C.P.R., Montreal, born at Montreal, Nov. 10, 1881.

W. Downie, ex-General Superintendent, Atlantic Division, C.P.R., now of Whitby, Ont., born at Rock Currie, Ireland, Nov. 12, 1850.

Jos. Dubrule, jr., Manager, Canadian Pacific Car and Passenger Transfer Co., and President, Prescott and Ogdensburg Ferry Co., Ltd., Prescott, Ont., born at Spencerville, Ont., Nov. 14, 1872.

R. L. Fairbairn, General Passenger Agent, Canadian Northern Ry., Toronto, born at Stillwater, Minn., Nov. 24, 1880.

W. A. Fitch, Assistant Superintendent, District 3, Intercolonial Ry., Moncton, N.B., born at Kentville, N.S., Nov. 25, 1867.

P. J. Flynn, Superintendent, Districts 2 and 3, Central Division, Canadian Northern Ry., Winnipeg, born at Fishers, N.Y., Nov. 22, 1872.

J. E. Gibault, A.M.Can.Soc.C.E., Resi-

C.P.R., Montreal, born at Liverpool, Eng., Nov. 2, 1866.

A. B. McNaughton, General Yardmaster, Ottawa Terminals, G.T.R., Ottawa, Ont., born at Arnprior, Ont., Nov. 10, 1877.

A. S. Munro, Commercial Agent, G.T.R. London, Ont., born at Hamilton, Ont., Nov. 10, 1880.

C. Murphy, General Superintendent, Manitoba Division, C.P.R., Winnipeg, born at Prescott, Ont., Nov. 20, 1865.

G. H. Nowell, District Master Mechanic, District 3, British Columbia Division, C.P.R., Nelson, born at Montreal, Nov. 13, 1885.

A. C. O'Neil, Travelling Freight Agent, G.T.R., London, Ont., born at Point Edward, Ont., Nov. 30, 1866.

W. J. Quinlan, District Passenger Agent, Grand Trunk Pacific Ry., Winnipeg, born at Montreal, Nov. 21, 1883.

G. H. Shaw, General Traffic Manager, Canadian Northern Ry., Toronto, born at Smiths Falls, Ont., Nov. 25, 1859.

J. G. Sutherland, Car Service Agent, Alberta Division, C.P.R., Calgary, born at Aulac, N.B., Nov. 24, 1882.

P. D. Sutherland, General Agent, Passenger Department, Canadian Pacific Ocean Services, Ltd., Hong Kong, China, born at Toronto, Nov. 2, 1879.

L. C. Thomson, General Storekeeper, Eastern Lines, Canadian Northern Ry., Toronto, born at Kingston, Ont., Nov. 25, 1882.

H. P. Timmerman, Industrial Commissioner, Eastern Lines, C.P.R., Montreal,

born at Odessa, Ont., Nov. 6, 1856.
H. E. Whittenberger, General Superintendent, Ontario Lines, G.T.R., Toronto, born at Peru, Ind., Nov. 9, 1869.
C. G. Washbon, Trainmaster, C.P.R., Brandon, Man., born at Morris, N.Y., Nov. 27, 1887.
W. A. Whyte, District Freight Agent, Canadian Northern Ry., Regina, Sask., born at Hornsey, England, Nov. 24, 1890.

Pacific Type Locomotives for Canadian Government Railways.

Ten heavy Pacific type 4-6-2 passenger locomotives are being built for Canadian Government Railways by Canadian Locomotive Co. They are of the railway standard type for this class, and only a few special features are embodied in the design. The boiler is of the extended wagon type, and is 72 in. in diameter at the front end and 75 in. at the largest course. The barrel is fitted with 2 and 5 1/2 in. dia. tubes, 20 1/2 ft. over tube sheets, and has 28-unit Locomotive Superheater Co's header. The fire box is 109 x 75 in., power operating grate shaker, radial buffers between engine and tender, self-centering valve stem guides, and extended piston rods, flexible stay-

Coal capacity.....	10 tons.
Style of truck.....	4 wheel equalized type.
Diameter of wheel.....	36 in.
Kind of wheel.....	Steel tired.
Diameter and length of journal.....	5 1/2 x 10 in.
Diameter and length of journal.....	5 1/2 x 10 in. M-C-B.
Brake beam.....	Simplex high speed.

National Transcontinental Railway Elevator at Transcona.

The elevator plant which is to be built at Transcona, Man., a little southeast of the N.T.R. shops will consist of a working house, with track shed, a storage house, dryer house and boiler house. The elevator's principal business will be to receive from and load into railway cars. Facilities for cleaning, drying and storing grain will be included in the equipment. All material used in the construction of the buildings and equipment, excepting belts and ropes, will be non combustible. The foundations will consist of reinforced concrete slab on wood piles. The working house will be 106 by 60 ft. 10 in., measured on the outside of first story columns. The first story and bins and cupola of the working house will be of reinforced concrete. The curtain walls of the first story and cupola will be of

house. The tunnels for basement conveyors between the working house and storage house will be of reinforced concrete throughout.
The buildings will be erected under the direction of C. B. Brown, Chief Engineer, Canadian Government Railways, and have been designed by John S. Metcalf Co. Ltd., Montreal, who will supervise the erection.
We are officially advised that contracts have been awarded for building the substructure to the Thunder Bay Contracting Co., Ltd., Port Arthur, Ont., and for the superstructure to Figles-Bellows Engineering Co., Ltd., Fort William, Ont.

Handrails on Locomotives and Tenders.

The Board of Railway Commissioners passed General Order 172, dated Sept. 28, as follows: Re general order 171, dated Aug. 1, 1916, requiring railway companies, inter alia, to equip the tenders of all locomotives of 100,000 lb. or over with a railing on both sides, on the top of the coping. Upon the report and recommendation of the Chief Operating Officer it is ordered that the said order



Pacific Type Locomotive, Canadian Government Railways.

steel frames, metallic packing, cross-bolts in breaking zone of fire box, cast heads of the 2 bar alligator type, Walschaert valve gear, relief valves, hard grease driving box cellars, vestibule type of cab, trailing truck of radial bar type, with out side bearings, Detroit 5-feed lubricator, incandescent headlight with latest type of turbo-generator, cast steel cradle at rear end of frame, injector check on top of boiler, pedestal type of tender box, and outside equalizer type, 4-wheel tender truck for 5 1/2 x 10 in. M-C-B journal. The general dimensions, etc., are as follows:
Fuel used.....Bituminous coal.
Weight in working order, drivers.....150,000 lbs.
Weight in working order, total.....230,000 lbs.
Wheel base of engine, rigid.....13 ft.
Wheel base of engine, total.....36 ft. 6 in.
Wheel base of engine and tender.....65 ft. 1 in.
Diameter of driving wheels.....73 in.
Material of driving wheels, centres.....cast steel.
Diameter and length of driving journals.....10 ft. x 13 in.
Diameter of cylinders.....23 1/2 in.
Stroke of cylinders.....28 in.
Type of boiler.....Radial stay.
Working pressure of boiler.....200 lbs.
Number of tubes.....205, 28.
Diameter of tubes.....2 in., 5 1/2 in.
Length of tubes.....20 1/2 ft.
Injectors.....Locomotive type.
Brakes.....Westinghouse American.
Superheater.....Schmidt type A.
Cab.....Vestibule type.
TENDER.
Weight, loaded.....150,000 lbs.
Capacity of tank in imp. gallons.....6,500
Style of tank.....Water bottom.

brick, 9 in. thick. The bin walls will be 65 ft. deep. Floors and roof will be of reinforced concrete and roof will be covered with tar, felt, and gravel.
A track shed, 104 1/2 ft. by 69 ft. 7 in., measured on centre line of columns and covering 4 railway tracks will extend along north side of the working house. It will be built of structural steel, outside wall and ends being covered with galvanized corrugated steel. Track openings will be closed by Kinnear doors. Roof and roof covering will be similar to those in the working house. Floors will be of concrete.
The storage house will be 135 ft. 7 in. x 90 ft. 7 in., measured on the outside of bin walls and will consist of 24 bins, having an inside diameter of 21 ft. 11 in. and 15 interspace bins. The walls of the storage bins will be 7 in. thick and 95 ft. high and will be built of reinforced concrete. Bin bottoms will be of concrete and so sloped and finished that they will be self emptying. The structure above the storage bins will be built of reinforced concrete, having floors, roof and roof covering similar to those in the working house. The tops of the bins will not be floored over.
The galleries connecting the working house and storage house will be of structural steel, covered with corrugated galvanized steel, with floors, roofs and roof coverings similar to those in the working

be amended by striking out the word "such" in the first line of paragraph 2.
General order 171 was published in full in Canadian Railway and Marine World for October, paragraph 2 reading as follows: "That the tender of all such locomotives be equipped with a railing on both sides, on the top of the coping; such railing, if made of round bar iron or of iron pipe, to be not less than 1 in. in diameter, supported by three columns, one at each end and one in the centre, standing 8 in. from the top of the coping; the said rails to run the full length of the fuel storage well, or clear of the back coal wall on the tender; that on the space back of the coal wall, where the water man hole is located, the coping or railing project 8 in. above the top of the tank and run around both sides and back of the tank not less than 8 in. high, supported by columns to make it secure. That plans showing the proposed foot rests and the railing on tenders be filed for the Board's approval."
By order 172 the word "such," shown in the paragraph quoted above in bold face letters, is struck out and the provision of railings on all tenders is made obligatory.
The locomotives dealt with in paragraph 1 of the order and which were referred to in paragraph 1 as "such locomotives" are locomotives of 100,000 lbs. and over.

Railway Mechanical Methods and Devices.

Testing Air Valves in C.P.R. Passenger Car Shops.

A device for testing air pressure governor valves and reducing valves in the C.P.R. passenger car shops, air brake department at Vancouver, is shown in the accompanying illustration. Prior to the

the car is applied and the reducing valve and air pressure governor on both are set to operate at a given pressure. This method eliminates a lot of adjusting in the passenger car yard and prevents a car leaving the yard with valves not properly adjusted. We are indebted to T. Spence, General Car Foreman, C.P.R., Vancouver, for the foregoing information

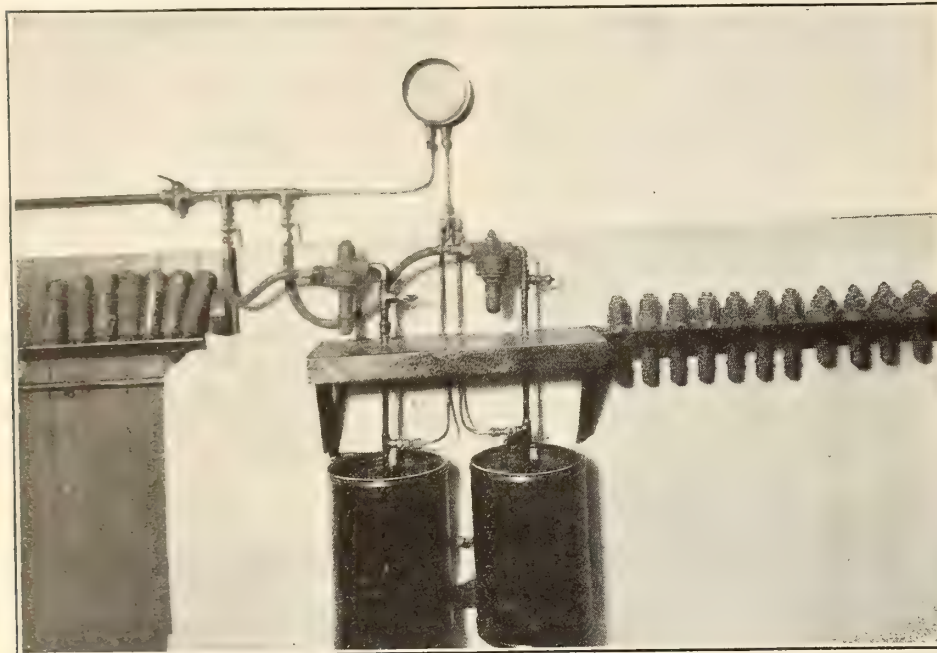
was designed to ensure strictly clean brass and copper scrap. It consists of half of an old G.E. 800 type motor case, fitted with a special shunt wound field coil, connected on 500 volt circuit with outside resistance.

The mixed clippings are shovelled into the upper hopper, which is made of wood with a slotted outlet about 1x4 in., situated directly above the centre of the magnet and about 2 in. out from the face so that clippings sifted through this opening fall directly past the magnet's field. The brass, not being attracted in falling, strikes a baffle, which throws it into the outer box. The steel and iron, being attracted by the magnet, are either drawn against its face or dropped through a 3 in. opening about 15 in. long into the rear box. The clippings which are held against the magnet face are dropped directly into the rear box when power is released from the magnet.

Mixed clippings are of little value and this device has paid for itself many times over owing to the high price obtained for clear brass and copper clippings. The cost of power to operate the magnet is negligible. We are indebted for the foregoing information and the photographs to Keith MacLeod, Engineer of Equipment, Montreal Tramways Co.

Salvaging Shears and Hammer, Michigan Central Shops.

The accompanying illustration shows a machine used in salvaging reclaimed iron, etc., and separating cast and wrought iron. It was built from scrap material under the direction of N. Marple, General Car Foreman, M.C.R. Shops, St. Thomas, Ont., and consists of cutting shears and striking hammer. The hammer is made from an old car axle and is held in position by steel wheel centre. The frame is made from old channel iron, the gasoline engine is the remains of a discarded cement mixer, the shears crank shaft is



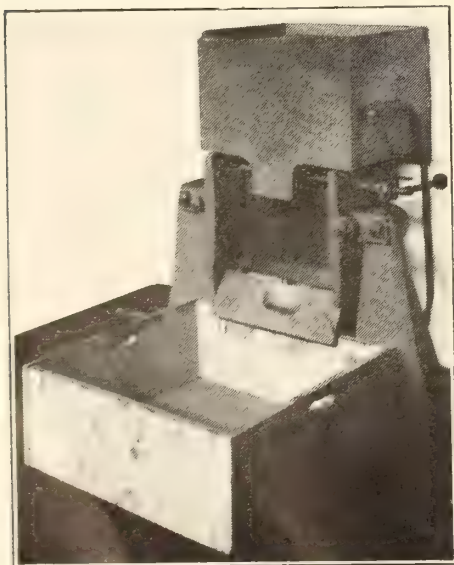
Device for Testing Air Pressure Governor and Reducing Valves.

installation of the device, valves were cleaned and ground in the shop, reassembled and put back into position in their respective places on the cars. As they have to be adjusted to a 15 and 60 lb. air pressure it was necessary to have the tank under air pressure to make the adjustment and this method very often caused delay.

and photograph from which the illustration was made.

Magnetic Separator for Brass Turnings, Montreal Tramways Co.

The device illustrated herewith is used for separating steel and iron chips from



Magnetic Separator for Brass Turnings.

The testing device is made up of two air chambers connected to air pressure through a 3-way valve with double hand gauge above, so that the same condition that occurs in the air brake system on



Salvaging Shears and Hammer.

brass and copper turnings. Although precautions are taken to keep turnings from each job separate, it is impossible to entirely prevent foreign chips from getting into the pans, and the separator

made from an old engine, the bed of the shears, from an old engine bed, the shear rims from two passenger truck equalizers, and the fly wheel and pulleys from scrap. The shears make 52 cuts a

minute and cut up to $1\frac{1}{2}$ in. diameter. The hammer, which is used for straightening salvage iron, strikes 100 blows a minute and will straighten iron up to $1\frac{1}{2}$ in. diameter. Since the photograph was taken the engine parts have been covered in and the rest of the machine covered over for protection from the weather, and safety devices have been applied to protect the men working. The machine has proved a valuable saver on scrap material. We are indebted for the foregoing information and for the photograph to John Jackson, Foreman, Repair Track, M.C.R., St. Thomas, Ont., who took the photograph from which the illustration was made.

Stationary Locomotive Stack Blower on the Grand Trunk Pacific Railway.

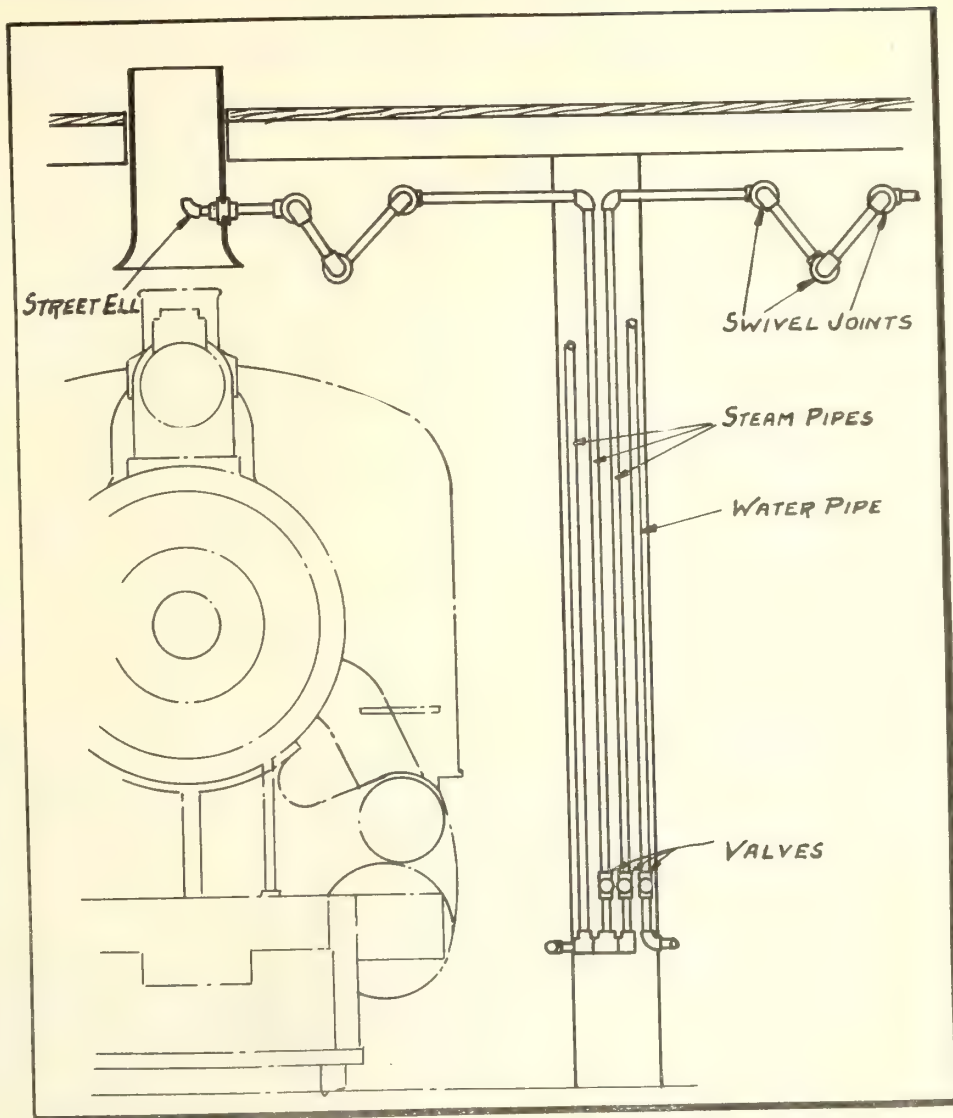
The accompanying sketch shows a method of arranging piping with attachment and connection for stationary locomotive stack blower, in use in the Grand Trunk Pacific locomotive house at Watrous, Sask. A line of 2 in. steam piping is run from the stationary boilers through the locomotive house and is placed high enough so that the locomotives pass under it. From this steam line at every second post is a $1\frac{1}{4}$ in. pipe coming down to within about 4 ft. from the floor. This pipe has a valve and from the valve steam is carried back up the same post to each smoke jack. This makes three valves at the post, which govern the flow of steam. Flexible joints are used from the post to the smoke jacks so that the jack can be raised and lowered. This style of blower has been in use over two years and all the expense necessary has been to grind in the valves occasionally. It is always ready for service and the boilermakers, as well as the light-up man, make use of it. When used for lighting up they do not let any smoke outside the jack but will actually take the smoke out of the locomotive house if it should be close to the stack. We are indebted to Geo. Robinson, Locomotive Foreman, Watrous, Sask., for the foregoing information.

Rivetting Dolly in Grand Trunk Shops.

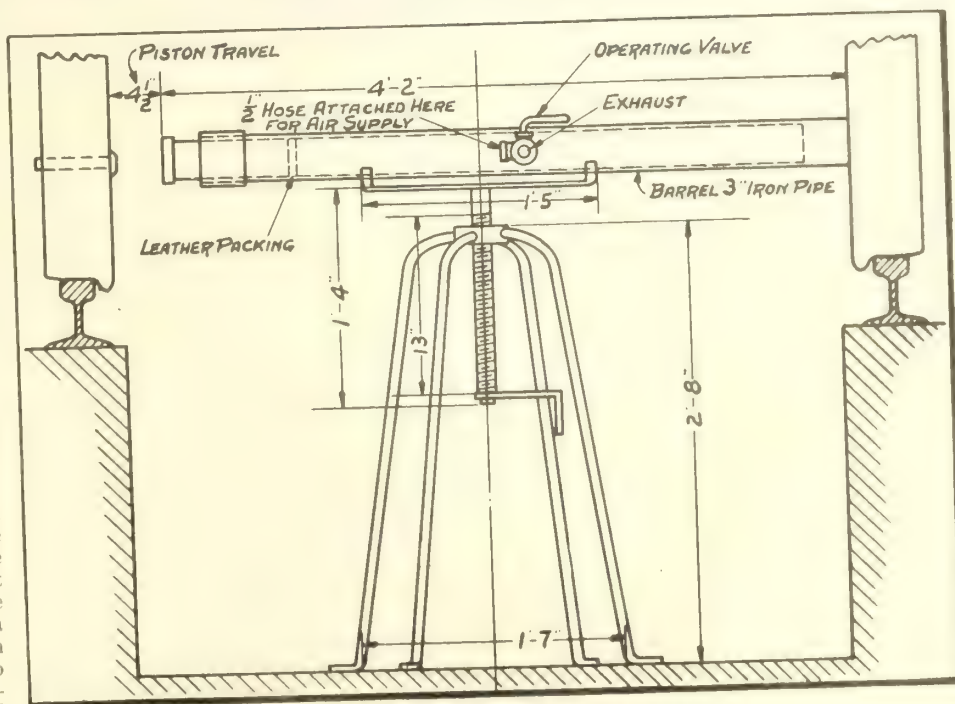
The accompanying plan shows a rivetting dolly used in the G.T.R. shops at Belleville, Ont., operating in a pit, for holding behind rivets in driving wheels, locomotive and tender truck wheels where the tires are rivetted on with an air hammer.

The measurements in the plan are for the wheel dolly, a similar one of the required size can be used to an advantage for holding against foundation ring rivets inside of fire box.

The frame is made from wrought iron scrap welded to a centre in which the raising or lowering screw operates. The barrel is made from three-inch wrought iron pipe with a plug welded solid in one end. The opposite end is fitted with a three-inch pipe coupling screwed up flush and the inside bored out to fit snug to the piston which has a packing ring attached on the inside surface. Air is fed through a half-inch hose and controlled by a three-way air cock tapped into the three-inch pipe about the centre. We are indebted to W. H. Towner, Locomotive Foreman, G.T.R., Belleville, for the foregoing information.



Stationary Locomotive Stack Blower on G.T.P.R.



Rivetting Dolly.

Queen's University, Kingston, Ont. The following appointments have been made: J. F. Wilson of Michigan University, Professor of Electrical Engineering;

L. S. Eaton of Cornell University, Professor of Mechanical Engineering; I. C. Demarest of Columbia University, Lecturer in Latin.

Box Cars for Duluth, Winnipeg and Pacific Railway.

The 750 box cars which the Canadian Northern Ry. is having built for its subsidiary, the Duluth, Winnipeg & Pacific Ry., by Haskell & Parker Car Co., Michigan City, Ind., will have the following general dimensions:—

Length over end sills	36 ft. 9 3/4 in.
Length inside, in the clear	35 ft. 10 3/4 in.
Width over side sills	9 ft. 3/4 in.
Width inside, in the clear	8 ft. 6 1/2 in.
Width of side door opening	6 ft.
Height of side door opening	7 ft. 6 in.
Height inside in the clear	8 ft.
Truck wheel base	5 ft. 4 in.
Side bearing centers	4 ft. 2 in.
Capacity	80,000 lbs.

The general equipment will include:— Westinghouse 812 air brakes; angle cock holders; malleable iron brake steps; security no. 5 door fixtures; inside metal roof no. 26 gauge corrugated, galvanized iron; roller side bearings; cast-steel draft arms arranged for 6 1/4 x 8 in. tandem

The trucks will be of the arch bar type of 40 tons capacity, with a wheel base of 5 ft. 4 in.

Bogie Cars for the Nigerian Ry.

The Nigerian Railway in West Africa, which is owned by the Government of that Crown Colony, has, through the Crown Agents for the Colonies, had built by Canadian Car & Foundry Co. at Montreal 100 low-sided bogie cars, one of which is illustrated herewith. As they are for use on railway construction in the tropics they are designed to suit special conditions. They can be converted into flat cars by releasing sides and ends, making a car that can be used to best advantage in Nigeria.

The underframe is built up of standard American rolled sections, and trussed with rolled o.h.s. angles, forming a light yet strong construction, and covered with red pine flooring and 1/8 in. thick o.h.s. plates. In addition to this, at the joints

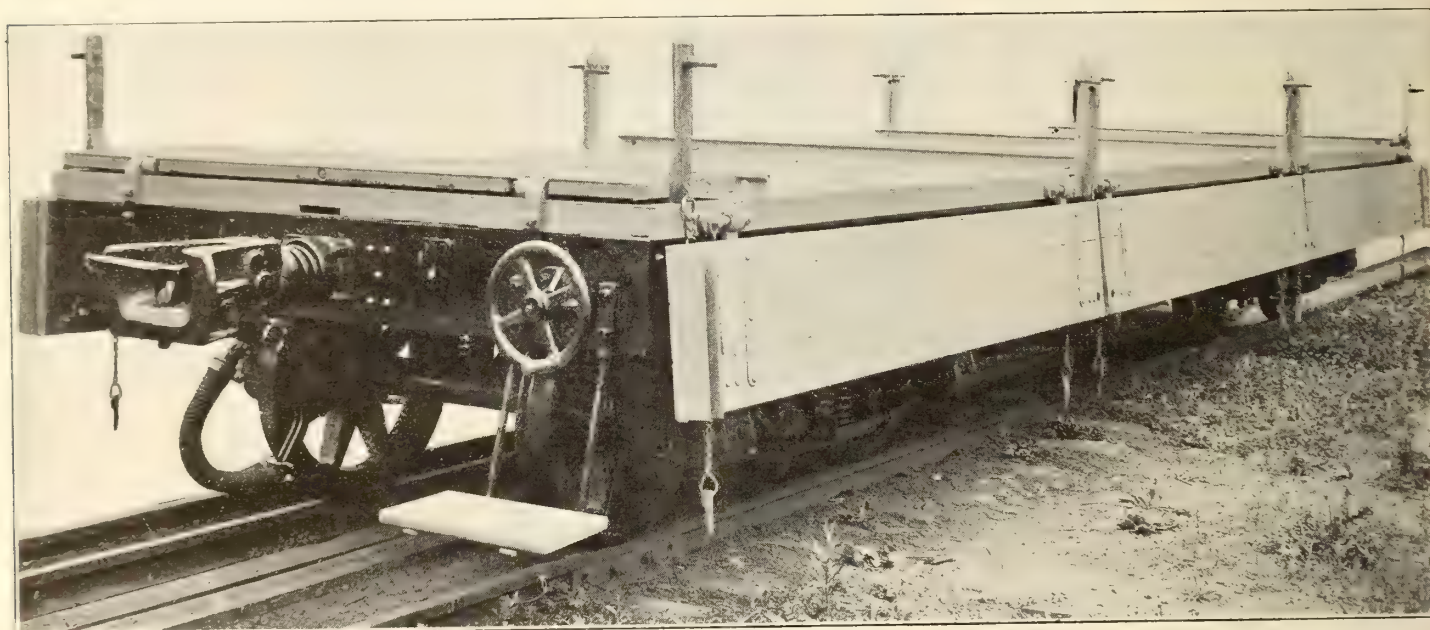
Canadian Pacific Railway Traffic Statistics.

The following figures are for the fiscal years ended June 30, 1915, and 1916, respectively:—

Freight forwarded.	1914-1915.	1915-1916.
Flour, barrels	8,538,600	10,499,260
Grain, bushels	126,909,828	276,788,209
Live stock, head	2,833,726	2,190,389
Lumber, feet	2,180,735,600	2,696,804,934
Firewood, cords	254,428	298,426
Manufactured articles, tons	6,024,590	7,960,723
All other articles, tons	7,423,163	8,228,156
Freight Traffic.	1914-1915.	1915-1916.
Number of tons carried	21,490,596	29,276,872
Number of tons carried one mile	7,940,151,342	14,057,685,773
Earnings per ton per mile	0.76 cts.	0.64 cts.
Passenger Traffic.	1914-1915.	1915-1916.
Passengers carried	13,202,603	13,833,978
Passengers carried one mile	1,164,488,630	1,255,561,198
Earnings per passenger per mile	2.06 cts.	1.97 cts.

TRAIN TRAFFIC STATISTICS.

Earnings of lake and river steamships, are not included below.



Bogie Car for Nigerian Railway.

spring draft gear; cast steel couplers, 5 x 7 in. shank; cast steel body bolsters; cast steel truck bolsters; malleable iron journal boxes, M C B for 5 x 9 in. journals; steel back brake shoes; M.C.M. class C truck springs; M.C.B. 5 x 9 in. journal bearings; M.C.B. 5 x 9 malleable iron journal wedges; M.C.B. trussed channel brake beams, no. 2; basswood dust guards.

The underframe will consist of eight 5 x 9 in. yellow ipne sills tenoned into the end sills, which will be of oak 8 x 9 in. cross ties. The underframe will be reinforced by six 1 1/4 in. truss rods. The cast steel draft arms, which will be bolted to the centre sills, will be arranged to hook over the cast steel bolsters, and will be braced by 5 x 5 in. oak sub-sills bolted to centre sills and extending lengthwise of the car between draft arms.

The superstructure will be of the double sheathed type, lined on the sides with 13/16 x 5 1/4 in. face board to the upper girth and lined on the ends to the plate with 1 1/2 x 5 1/4 in. face boards. The framing on the sides will be 2 1/2 in. thick, and the end framing 4 in. thick. Pocket castings will be used at the top and bottom of all side and end posts and braces.

The roof will be of the inside metal type, supported by yellow carlines.

of the steel plates 4 25-lb. a yard rails are bolted in place to protect the flooring and also to facilitate unloading of rails when the car is used for this purpose. The ends and sides are composed of red pine, stiffened with batten angles and hinges. Both ends and sides are hinged to butts riveted to the side angles of end sills.

The trucks are the standard American arch bar type, with built up bolsters. The side bearings are the friction type.

The wheels are of the European type, 33 1/2 in. dia. with wrought iron forged spoke centre, and o.h.s. tires mounted on axles with 4 1/4 x 8 in. journals. The oil boxes are made of cast iron and are filled with hair waste and oil.

Fifty of them are equipped with vacuum air brakes complete, and 50 are equipped only with through piping. In addition to the air brakes, all the cars are arranged to be operated with hand brake wheel at one end. They are all equipped with A.B.C. couplers, which are standard on this Nigerian Ry.

The Nigerian Railway has also had built by Canadian Car & Foundry Co. 100 ten-ton end tipping coal cars, which were described and illustrated in Canadian Railway and Marine World for April.

TRAIN MILEAGE.

	1914-5.	1915-6.
Passenger trains	17,977,033	18,159,545
Freight trains	16,896,368	25,355,997
Mixed trains	1,939,478	2,098,825

Total trains	36,812,879	45,614,367
--------------	------------	------------

CAR MILEAGE.

Passenger:		
Coaches and p.d. and s. cars	87,283,067	88,080,027
Combination cars	2,829,455	2,835,311
Baggage, mail and express cars	40,691,990	39,335,804
Total passenger cars	130,804,512	130,251,142
Freight:		
Loaded	404,249,594	603,705,406
Empty	144,408,527	280,241,711
Caboose	18,476,337	27,558,818
Total freight cars	567,134,458	911,505,930
Passenger cars per traffic train mile	6.57	6.43
Freight cars per traffic train mile	30.11	33.20

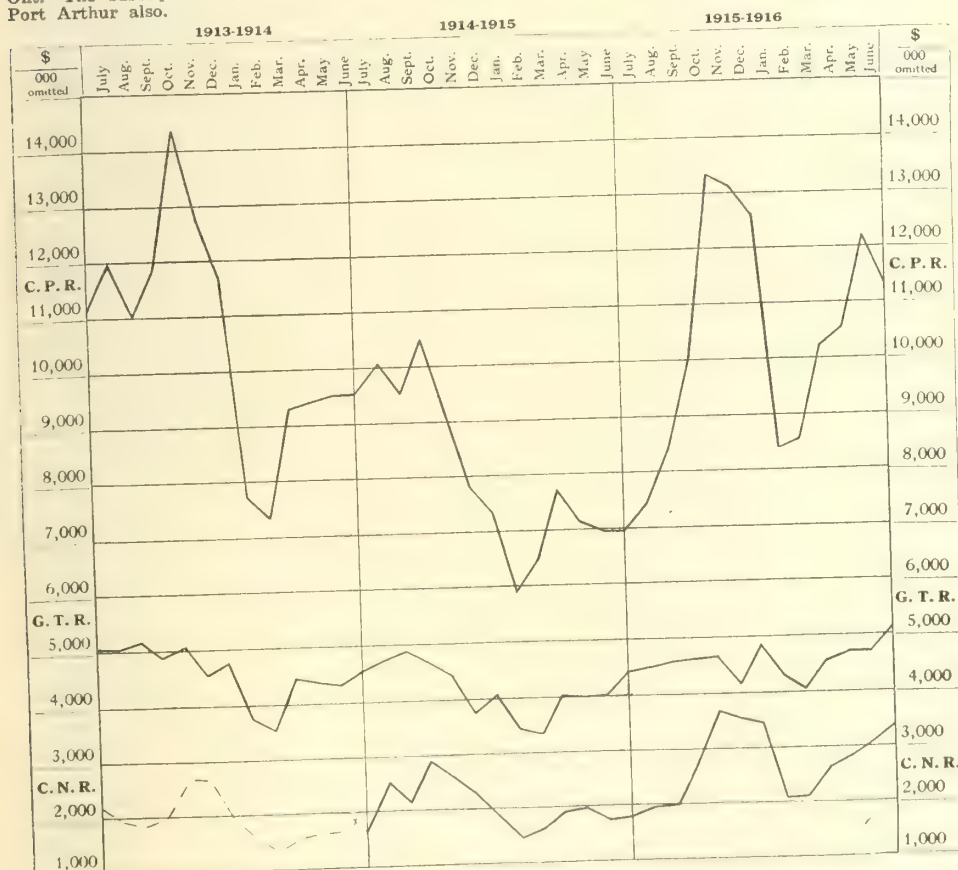
PASSENGER TRAFFIC.

Passengers carried (earning revenue)	13,086,064	13,727,219
Passengers carried (earning revenue) one mile	1,155,371,348	1,247,118,119
Passengers carried (earnings revenue) one mile per mile of road	93.413	96.546
Average journey per passenger, miles	88.29	90.85
Average amount received per passenger	1.81	1.78

Average amount received per passenger mile, cts.	2.05	1.96	Total tons (all classes) freight carried one mile per mile of road	705,017	1,170,756
Average number of passengers per train mile	58.01	61.56	Average amount received per ton per mile of freight	0.773	0.641
Average number of passengers per car mile	12.82	13.72	Average no. of tons of revenue freight per train mile	410.62	503.46
Revenue from passengers per passenger car mile, cts.	26.32	26.84	Average no. of tons of non-revenue freight per train mile	52.32	47.37
Total passenger train earnings per train mile	1.53	1.55	Average no. of tons of (all classes) freight per train mile	462.94	550.83
Total passenger train earnings per mile of road	2,468.87	2,425.15	Average no. of tons of revenue freight per loaded car mile	19.13	22.90
FREIGHT TRAFFIC.			Average no. of tons of non-revenue freight per loaded car mile	2.44	2.15
Tons of revenue freight carried one mile	7,734,433,065	13,822,500,920	Average no. of tons of (all classes) freight per loaded car mile	21.57	25.05
Tons of non-revenue freight carried one mile	985,500,816	1,300,624,817	Freight train earnings per loaded car mile, cts.	14.79	14.68
Total tons (all classes) freight carried one mile	8,719,933,881	15,123,125,737	Freight train earnings per train mile, cts.	3.17	3.23
Tons of revenue freight carried one mile per mile of road	625,338	1,070,068	Freight train earnings per mile of road, cts.	4,832.53	6,860.21
Tons of non-revenue freight carried one mile of road	79,679	100,688			

Gross Earnings of Canadian Railways.

Up to June 30, 1914, the figures were for the Canadian Northern Ry. west from Port Arthur, Ont. The subsequent figures are for the Canadian Northern Ry. System, including lines east of Port Arthur also.



The Roadmasters and Maintenance of Way Association held its 34th annual convention at New York recently. The officers for the current year are: M. Burke, C.M. & S.P., Chicago, President; A. Grills, Superintendent of Track, G.T.R., St. Thomas, Ont., First Vice President; J. B. Oatman, Second Vice President; P. J. McAndrews, C.N. & W., Sterling, Ill., Secretary; W. H. Kosmehl, Elgin, Ill., Treasurer. The next convention will be held in Chicago, Ill.

The Grand Trunk Railway Patriotic Association held its second annual meeting at Toronto Sept. 30, when \$2,000 was voted for the British Red Cross Society, and about \$1,500 for the dispatch of

Christmas boxes to all G.T.R. terminal employees who have enlisted, whether they are in Canada or elsewhere. It was also decided to pay the Canadian Red Cross Society \$5 a week per man to look after each of the company's employees who may be a prisoner.

The Quebec Railway Light & Power Co.'s Montmorency Division, which has been sold to the Dominion Government, has not yet been transferred, but is being operated by the company on behalf of the government.

Canadian Railway Club. At the monthly meeting in Montreal, Oct. 10, W. S. Thompson, of the G.T.R. Press Bureau, read a paper on railway publicity.

C.P.R. Expenditures on Additions and Improvements.

During the year ended June 30, the following amounts were spent:

EASTERN LINES:	
Additional sidings, buildings, stations and yards	\$ 85,232.57
Permanent bridges and improvements of line	155,801.97
WESTERN LINES:	
Additional sidings, buildings, stations and yards	\$ 103,544.44
Permanent bridges and improvements of line	130,717.80
Fort William terminals, including coaling plant	1,360.42
East Winnipeg yard	28,847.92
Winnipeg station and hotel	77,193.60
Winnipeg terminals	99,980.94
Calgary hotel	4,213.11
Vancouver terminals	45,331.24
Connaught tunnel	1,251,732.47
Right of way	5,188.90
Additions to office buildings and hotels	1,748,110.84
Rented and temporary sidings	686,102.89
Telegraph extensions and additions	7,218.60
	28,572.41
	\$2,778,655.38

Expenditure on Leased and Acquired Lines.

NEW BRUNSWICK RY.:	
Additional sidings, buildings, stations and yards	\$ 3,085.92
Permanent bridges and improvements of line	15,129.90
St. John terminals	21,693.03
ATLANTIC & NORTH WESTERN RY.:	
Additional sidings, buildings, stations and yards	20,952.60
Permanent bridges and improvements of line	21,631.68
MONTREAL & OTTAWA RY.:	
Permanent bridges and improvements of line	8,366.02
MONTREAL & WESTERN RY.:	
Additional sidings, stations and yards	259.62
Permanent bridges and improvements of line	500.09
Account purchase of road	15,231.58
ONTARIO & QUEBEC RY.:	
Additional sidings, buildings, stations and yards	17,213.56
Permanent bridges and improvements of line	42,158.85
Double tracking	2,226.41
Toronto terminals	36,612.57
MANITOBA & NORTH WESTERN RY.:	
Additional sidings, buildings, stations and yards	802.50
Permanent bridges and improvements of line	960.41
Right of way	705.86
MANITOBA SOUTH WESTERN COLONIZATION RY.:	
Additional sidings, buildings, stations and yards	2,998.17
CALGARY & EDMONTON RY.:	
Additional sidings, buildings, stations and yards	7,067.57
Permanent bridges and improvements of line	1,516.46
Right of way	266.53
COLUMBIA & WESTERN RY.:	
Additional sidings, buildings, stations and yards	3,122.45
Permanent bridges and improvements of line	30,573.04
Right of way	1,776.28
NEW BRUNSWICK SOUTHERN RY.	
CAP DE LA MADELINE RY.	179.38
NORTHERN COLONIZATION RY.	32.51
ORFORD MOUNTAIN RY.	173.99
OTTAWA, NORTHERN & WESTERN RY.	14.85
ST. MAURICE VALLEY RY.	5,017.15
GEORGIAN BAY & SEABOARD RY.	311.61
GUELPH & GODERICH RY.	10,138.73
LINDSAY, BOBCAYGEON & PONTIAC RY.	1,798.62
TYPOOL RY.	1,008.50
SOUTH ONTARIO PACIFIC RY.	21.81
TILLSONBURG, LAKE ERIE & PACIFIC RY.	739.02
WALKERTON & LUCKNOW RY.	2,828.14
ALBERTA CENTRAL RY.	1,626.06
COLUMBIA & KOOTENAY RY.	745.01
KASLO & SLOCAN RY.	837.12
KOOTENAY & ARROWHEAD RY.	110.00
NICOLA, KAMLOOPS & SIMILKAMEEN RY.	325.00
VANCOUVER & LULU ISLAND RY.	55.88

The Canadian Pacific Railway's Roll of Honor.

List 13, Sept. 24.

Brown, James Ernest	Trainman	B. C. Div.	Wounded
Clark, Albert Edward	Call boy	Winnipeg	Wounded
Clarke, Andrew W.	Ashpitan	Lambton	Wounded and missing
Deacon, John Canton	Coach carpenter	Angus	Wounded
Donworth, William	Clerk	Montreal	Wounded
Edgar, John Hamilton	Loco. inspector	Montreal	Wounded
England, Stanley L.	Clerk	Montreal	Wounded
Flyn, Charles Angus	Ditch rider	Lethbridge	Died of wounds
Gilbertson, Magnus	Draftsman	Brooks	Killed in action
Haskell, Charles S.	Checker	Saskatoon	Wounded
Hicks, Stephen C.	Stationary fireman	Ignace	Wounded
Jaffray, Matthew	Trucker	Toronto	Wounded
Johnson, James Albert	Porter	Fort William	Wounded
Johnstone, Sidney G.	Brakeman	B. C. Div'n	Killed in action
McLean, James	Loco. engineer	Calgary	Wounded
McLeod, William	Station cleaner	Vancouver	Gassed
Malcolm, John E.	Instrumentman	Ducks	Wounded
Maughan, Herbert	Tapeman	Calgary	Wounded
Miller, Ralph	Fitter's helper	Glen Yard	Wounded
Miller, Thomas J.	Storeman	Winnipeg	Wounded
Moroney, William J.	Wiper	Wynyard	Wounded
Nebbs, Thomas A.	Clerk	Winnipeg	Wounded
Nelson, Arthur W.	Brakeman	B.C. Div'n	Wounded
Payne, Albert	Operator	Portage La Prairie	Wounded
Richards, Joseph V.	Operator	Calgary	Killed in action
Roberts, Wilfred	Clerk	Angus	Wounded
Robinson, John	Tender truck repairer	Ogden Shops	Wounded
Rogers, Ronald	Supply car man	Winnipeg	Wounded
Russell, Douglas	Clerk	Winnipeg	Wounded
Russell, Edward	Clerk	Montreal	Wounded
Scotland, Thomas H.	Clerk	Calgary	Wounded
Selwood, Albert P.	Freight clerk	Str. "Sicamous"	Wounded
Spence, Charles	Boilermaker	Angus	Wounded
Still, Geoffrey	Loco. fireman	B.C. Div'n	Wounded
Stitt, Fred.	Laborer	Lambton	Wounded
Stubbins, Joseph W.	Loco. fireman	Souris	Wounded
Thomson, Gordon M.	Chief clerk	Winnipeg	Wounded
Tilt, Frederick G.	Clerk	Angus	Wounded
Tongs, Harry	Wiper	Brandon	Suffering from shock
Turner, John	Car repairer	Toronto	Wounded
Wedge, Percy H.	Trimmer	Cartier	Wounded
West, John William	Deckhand	Str. "Minto"	Wounded
Will, James	Boilermaker	Angus	Wounded
Williams, Ivor S.	Machinist's helper	Ogden Shops	Wounded
Wyatt, William G.	Waiter	Montreal	Killed in action

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were drawn.

General Order 172. Sept. 28.—Amending general order 171, Aug. 1, 1916, re railing on locomotive tenders.

25428. Sept. 15.—Authorizing Brantford & Hamilton Ry. to rebuild bridge over Toronto, Hamilton & Buffalo Ry. near Cainsville, Ont.

25429. Sept. 15.—Approving plan showing change in location of crossing of G.T.R. by Berlin & Northern Ry. on Wellington St., Kitchener, Ont., work be done at expense of B. & N. R.

25430. Sept. 19.—Authorizing British Columbia Public Works Department to build highway crossing at each end of Grand Trunk Pacific Ry. bridge across Fraser River at Prince George.

25431. Sept. 19.—Approving Dominion Public Works Department's plan of bridge to be built across St. Charles River at Quebec.

25432. Sept. 19.—Authorizing Saskatchewan Board of Highway Commissioners to build highway over right of way of C.P.R. Swift Current Northwesterly Branch in n.e. ¼ Sec. 3-23-28, w.3m.

25433. Sept. 19.—Authorizing Canadian Northern Ry. to open for traffic extension of its Winnipeg and Northern Branch, mileage 48.56 to 62.72.

25434. Sept. 19.—Extending for 60 days from date time within which C.P.R. shall install bell at second public highway south of Brampton, Ont.

25435. Sept. 19.—Extending for one year from date time for building new Toronto, Hamilton & Buffalo Ry. bridge carrying King St., Hamilton,

Ont., over track, subject to conditions that city be not liable for any damages arising from non-repair bridge, and that T. H. & B. R. place walks on existing bridge in proper repair.

25436. Sept. 15.—Ordering G.T.R. to maintain day watchman between 7 a.m. and 7 p.m. at Laframboise St., St. Hyacinthe, Que.; cost to be divided equally between G.T.R. and municipality.

25437. Sept. 20.—Approving agreement between Bell Telephone Co. and Pleasant View Telephone Co., Aug. 16, 1915.

25438. Sept. 20.—Approving revised location Lake Erie & Northern Ry. from station 0 + 26.1 to 3 + 13.8, Brantford, Ontario.

25439. Sept. 19.—Ordering Grand Trunk Pacific Ry. to build spur track to accommodate at least 3 cars, switch points to be placed on tangent east of mail crane; and shelter station not below Board's standard 1 "B." with 60 ft. platform and driveway to siding, at Skeena Crossing, B.C.

25440. Sept. 20.—Authorizing G.T.R. to build siding for Peterborough Metal Products Co., Peterborough, Ont.

25441. Sept. 20.—Authorizing Canadian Northern Ry. to build across highway between River Lot 101, St. Paul's Parish and s.w. ¼ Sec. 33-11-4, e.p.m., Man.

25442 to 25446. Sept. 20.—Authorizing Canadian Northern Ry. to build across highways, between river lots 64 and 63; and 95 and 94; across Panet Road in lot 101; river lot 101, on either side C.P.R., St. Paul's Parish, Man.; and across highway between s.w. ¼ Sec. 33 and n.w. ¼ Sec. 28-11-4, e.p.m., Man.

25447, 25448. Sept. 19.—Approving Bell Telephone Co. agreements with Zion Line Telephone Association, Ltd., Aug. 25, 1915, and the Omamee Telephone Co., Sept. 9, 1916.

25449. Sept. 20.—Authorizing G.T.R. to build sidings and spurs for James Playfair, Midland, Ont.

25450. Sept. 20.—Authorizing C.P.R. to build

its Irricana Subdivision at mileage 6.88 across diverted highway in n.e. ¼ Sec. 14-22-19, w.4 m., Alta.

25451. Sept. 21.—Authorizing C.P.R. to build second track across Level St., Churchbridge, Man.

25452. Sept. 20.—Authorizing G.T.R. to build siding for Forwarders Ltd., Kingston, Ont.

25453. Sept. 22.—Suspending, pending hearing to be fixed by Board, proposed cancellation of special commodity rates on iron and steel articles from stations in Canada to St. Lawrence River and Atlantic ports for export, as contained in schedules of G.T.R., C.P.R., T. H. & B. Ry., C.N.R., M.C.R., Wabash Ry. and P. M. R.

25454 to 25456. Sept. 22.—Authorizing C.P.R. to use bridges 94.26 over Columbia River at mileage 38.7, and over Bull River at mileage 9.2, Kootenay Central Ry., B.C.

25457. Sept. 22.—Approving Toronto, Hamilton & Buffalo Ry. Standard Mileage Freight Tariff, C.R.C. 1113, cancelling C.R.C. 1, applying between stations on its line issued Sept. 15.

25458. Sept. 23.—Authorizing C.P.R. to build two spurs for Curtis & Harvey, Ltd., Rigaud Parish, Que.

25459. Sept. 20.—Authorizing G.T.R. to build siding for B. Blair Co., Woodstock, Ont.

25460. Sept. 22.—Ordering G.T.R. to build farm crossing for O. Murphy, Victoria Road, Ont.

25461, 25462. Sept. 22.—Authorizing C.P.R. to use bridges at mileage 59.8 over Findlay Creek, and at mileage 46.62 over Skookumchuck Creek, Kootenay Central Ry.

25463. Sept. 22.—Authorizing G.T.R. to use bridge 180, at milepost 122.90, District 3, Montreal Division, Que.

25464. Sept. 25.—Ordering that railway companies interested establish with as little delay as possible, a joint rate of 47c a ton to apply on coal in carloads from Niagara frontier to Thorold and St. Catharines for Niagara, St. Catharines and Toronto Ry. delivery, to be apportioned between the two companies as follows—27c a ton to M.C.R. and 20c a ton to N. St. C. & T. R.

25465. Sept. 25.—Authorizing City of Toronto to extend its street railway across G.T.R. by bridge authorized under order 24788 and authorizing City and G.T.R. to operate over and under said bridge, respectively.

25466. Sept. 25.—Extending for three months from date, time within which C.P.R. shall install bell as directed by order 25184, July 24.

25467. Sept. 22.—Authorizing Canadian Northern Ry. to remove its agent at Gooderham station, Ont., station to be kept clean and heated for passengers, and to care for l.c.l. freight and express matter; telephone connection to be maintained for transmission by caretaker to agent at Bancroft of any messages necessary in connection with operation of railway.

25468. Sept. 23.—Approving Dominion Atlantic Ry. plan showing location and details of new passenger station and freight shed at Middleton, N.S.

25469. Sept. 23.—Authorizing Grand Trunk Pacific Ry. to build spur for Island Lake Coal Co. at mileage 839.9 west of Winnipeg, Alta.

25470. Sept. 27.—Authorizing C.P.R. to build spur for Russell Motor Car Co., Toronto.

25471. Sept. 27.—Authorizing G.T.R. to build siding for Kingston Shipbuilding Co., Kingston, Ont.

25472. Sept. 27.—Dismissing application of C. R. Harris & Son, Toronto, for order requiring C.P.R. to deliver milk and cream as before at Parkdale station and not West Toronto, which latter is inconvenient to applicant.

25473. Sept. 27.—Extending to Dec. 1 time within which C.P.R. shall install gates at Dorchester St. Quebec, pending installation C.P.R. to place watchman at crossing between 7 a.m. and 6 p.m.

25474. Sept. 27. Amending order 25246, July 27, re Quebec Oriental Ry. shelter between Caplin and Bonaventure, Que.

25475. Sept. 27.—Ordering Canadian Northern Ry. to build farm crossing for T. Boughen, near Swan River, Man.

25476. Sept. 27.—Authorizing C.P.R. to build spur for Dominion Timber & Minerals, Ltd., Grenville Tp., Que.

25477. Sept. 27.—Authorizing Michigan Central Rd. to build spur for H. J. Heinz Co., Leamington, Ont.

25478. Sept. 27.—Authorizing C.P.R. to build spur at Riverton, Man., for Sigurdson, Thorvaldson Co.

25479. Sept. 28.—Approving deviation of Toronto, Hamilton & Buffalo Ry., from Lot 19, Con. 1, from Grand River, Sherbrooke Tp., Ont., station 912 + 68 to 1008 + 18; and location from Lot 17 to east bank of Grand River, Port Maitland, station 1008 + 18 to 1013 + 37.

25480. Sept. 28.—Authorizing Vancouver, Victoria & Eastern Ry. & Navigation Co. (G.N.R.), to open for traffic portion of its line from Kettle Valley Ry. to Canadian Northern Pacific Ry. at Hope, B.C., 900 ft.

25481. Sept. 27.—Authorizing City of Montreal to build foot subway under C.P.R., in line with Melrose Ave.

25482. Sept. 29.—Authorizing Canadian Northern Ry. to build spur to gravel pit in Secs. 10, 15, and 22-15-12, w.2 m., near Kendal, Sask. and to cross highway between Secs. 10 and 15.

25483. Sept. 29.—Approving Canadian Northern Ontario Ry location in Port Arthur from mileage

1.57 to 1.88; and authorizing it to build two sidings for Saskatchewan Co-operative Elevator Co. and Grain Growers' Grain Co.

25484. Sept. 30.—Authorizing highway crossing over C.P.R. about 125 ft. west of First Ave., Oak Lake, Man.

25485. Sept. 30.—Ordering C.P.R. to build interchange track with Grand Trunk Pacific Ry. at Moose Jaw, Sask.; G.T.P.R. to contribute \$2,500 toward cost, reserving for further consideration cost of maintenance and rescinding orders 24797, March 16, and 25400, Sept. 11.

25486. Oct. 2.—Ordering C.P.R., within 60 days to install bell at Boulevard Gouin, Bordeaux, mileage 9.91, Ottawa Subdivision, Que., and maintain it at own expense; 20% cost installing to be paid out of Railway Grade Crossing Fund, remainder by company.

25487. Oct. 2.—Approving G.T.R. plan of proposed improvements to freight facilities at Windsor, Ont., to be completed by Dec. 31, 1916.

25488. Oct. 2.—Authorizing Northern Development Branch, Ontario Government, to construct trunk road across C.P.R. main line on boundary between Pedley and Springer Tps., mileage 21.28, Cartier Subdivision, and rescinding order 25219.

25489. Oct. 2.—Authorizing Canadian Northern Ry. to construct access highway between Secs. 7 and 8-18-7, e.p.m., Man.

25490. Oct. 3.—Ordering G.T.R. to erect station building at Eganville, Ont., by Dec. 1, 1916.

25491. Oct. 2.—Authorizing Town of Preston, Ont., to construct South St., across G.T.R., by a subway.

25492. Oct. 3.—Authorizing C.P.R. to replace 8-ft. through plate girder span over Muddy Creek, mileage 41.10 St. John Subdivision, with 8 x 8 ft. cement rail culvert.

25493. Oct. 3.—Approving location and detail plans of proposed remodelling G.T.R. passenger station at Dominion, Lachine, Que.

25494. Sept. 23.—Authorizing G.T.R. to build siding for Canadian Crocker Wheeler Co., St. Catharines, Ont., and change existing siding. Approving and authorizing vertical and lateral clearances, subject to G.T.R. undertaking to keep employees off tops and sides of cars when operating siding.

25495. Oct. 5.—Extending, until Dec. 1, 1916, time within which G.T.R. complete station at Mimico, Ont.

25496. Oct. 3.—Approving agreement between Bell Telephone Co. and Mount Horeb Telephone Association, Sept. 2, 1915.

25497. Oct. 5.—Authorizing C.P.R. to build spur for Western Co-operative Grain Co., Calgary, Alta.

25498. Oct. 5.—Amending order 25466, Sept. 25, re C.P.R. bells at Crawford's and Pardy's Crossings between Westfield and Hillandale, N.B.

25499. Oct. 5.—Authorizing Alberta Public Works Department to build crossing over C.P.R. in Sec. 12-43-10, 4.

25500. Oct. 4.—Authorizing C.P.R. to build scale track, 950 ft. long, for Wayagamack Pulp & Paper Co. on Bellefleur Island, Cap de la Madeleine Parish, Que.

25501. Oct. 6.—Extending to Nov. 19, time within which C.P.R. shall install bells at St. Francois and St. Antoine Sts. Rigaud, Que.

25502. Oct. 5.—Authorizing G.T.R. to build spurs for Toronto Harbor Commissioners, in Toronto Harbor industrial district.

25503, 25504. Oct. 6.—Authorizing G.T.R. to rebuild bridges over Rawdon Creek, milepost 16.14 from Belleville; on lot 3, Con. 2, Rawdon Tp., and bridge 34, milepost 66 from Belleville, Ont.

25505. Oct. 5.—Authorizing Canadian Northern Ontario Ry. to build bridge over Current River, Port Arthur, Ont.

25506, 25507. Oct. 3, 6.—Approving agreements between Bell Telephone Co. and Jackson Telephone Association, June 9, and Clavering Telephone Association, July 20, 1915.

25508. Oct. 5.—Ordering Canadian Northern Ry. to build flat station and siding, with cattle pen and loading chute, at Twin Elm, Ont.; to provide passenger service; and to take up shipments of milk and cream and express matter, in addition to handling passenger traffic offering; work to be completed by Dec. 31.

25509. Oct. 10.—Authorizing Canadian Northern Ry. to alter bridge over South Magnetawan River, mileage 34.86 from Parry Sound, Ont.

25510. Oct. 7.—Authorizing Canadian Northern Quebec Ry. to build extension of Standard Lime Co.'s tracks in lot 426, Parish St. Paul de Joliette.

25511. Oct. 10.—Dismissing application of residents and ratepayers of Torrance, Ont., for order directing Canadian Northern Ry. to build road in lieu of road closed in lot 24, Con. 27, Wood Tp., Ont.

25512. Oct. 4.—Authorizing C.P.R. to remove station agent at Moyie, B.C.

25513. Oct. 10.—Authorizing C.P.R. to operate trains over crossing of its Lac du Bonnet Subdivision and Berens Northeast cutoff at Murdock, Man., without first stopping trains.

25514. Oct. 10.—Amending order 25396, Sept. 8, re Saskatchewan Government crossing of Grand Trunk Pacific Branch Lines Co.'s right of way at Bechard Station.

25515. Oct. 11.—Relieving C.P.R. from providing further protection at crossing of side road 1 1/4 miles south of Berkeley, Ont.

25516. Oct. 10.—Authorizing C.P.R. to build spurs for Saskatchewan Co-operative Elevator Co., Port Arthur, Ont.

25517. Oct. 10.—Authorizing C.P.R. to build spur 890 ft. long for Canadian Tube & Iron Co., Montreal.

25518. Oct. 10.—Ordering G.T.R. to build farm crossing for A. Desilets, Breault Mill, Que.

25519. Oct. 10.—Authorizing Grand Trunk Pacific Ry. to build two highway crossings in lot 1169 and 6340, R. 5, Coast District, B.C.

25520. Oct. 11.—Authorizing Brantford & Hamilton Electric Ry. to establish its Brantford passenger station at Lake Erie & Northern Ry. station near Lorne Bridge, Brantford, and to extend its tracks from Market St. to L.E. & N.R. station.

25521. Oct. 12.—Authorizing Canadian Northern Ontario Ry. to build spur for J. C. Wilson & Co., Belleville, Ont.

25522. Oct. 10.—Approving Maine Central Rd. bylaw passed Sept. 13.

25523. Oct. 14.—Authorizing Central Vermont Ry. to build siding and passing track to Lime Stone Quarry, lot 230, R. 9, Stanbridge Tp., Que.

25524. Oct. 13.—Authorizing C.P.R. to build access highway on eastern boundary of n.w. 1/4 Sec. 32-35-11, w.3m., at Perdue, Sask., mileage 370 of its Pheasant Hills Branch.

25525. Oct. 13.—Authorizing C.P.R. to build diversion of road allowance on southern limit of s.w. 1/4 30-13-6, w.2m., at Windhorst, Sask.; and to extend Van Horne St. across its tracks, Sec. 25-13-7.

25526. Oct. 13.—Ordering Canadian Northern Ry. to install agent at Sturgis, Sask., by Oct. 20.

25527. Oct. 13.—Disallowing proposed increase from \$3 to \$5 a car in charge for stopping cars containing part carloads canned goods in transit for completion of loads.

25528. Oct. 12.—Relieving G.T.R. from providing further protection at highway west of Beamsville, Ont.

25529. Oct. 13.—Authorizing Canadian Northern Ontario Ry. to build spur for Hout Paper Mills, Ltd., Camden Tp., Ont.

25530. Oct. 13.—Relieving Canadian Northern Ry. from providing further protection at Chatham Road, St. Jerusalem Parish, Que.

25531. Oct. 11.—Authorizing Canadian Northern Ontario Ry. to cross C.P.R. with double track in lot 13, Con. 2 from bay, York Tp., Ont.; and to cross Park Drive, lot 13, Con. 2.

25532. Oct. 13.—Amending order 25451, Sept. 21, re C.P.R. crossing of Level St., Churchville, Manitoba, by substituting Saskatchewan for Manitoba.

Canadian Pacific Railway Construction, Betterments, Etc.

Ontario District.—We are officially advised that it is not the intention to electrify the Kingston and Pembroke Ry. as reported in the daily papers.

Local press reports state that the building of a branch line from Linwood on the Guelph and Goderich Ry. to Wellesley, about 9 miles, is being considered.

Manitoba District.—The Winnipeg City Council has approved of the plans for umbrella roofs to be erected on the platforms over the Main Street subway stipulating that nothing be added in the shape of walls, etc. The umbrella roofs referred to will be a culmination of those over the station platforms.

Saskatchewan District.—The Board of Railway Commissioners has directed the C.P.R. to build an interchange track with the Grand Trunk Pacific Ry. at Moose Jaw, Sask., this company to pay \$2,500 towards the cost. The cost of maintenance of the track is reserved for future consideration.

Alberta District.—The Sterling division has been extended from Foremost easterly to Pakowki, Alta., 22.2 miles, by the opening for traffic of that section of the line generally known as the Weyburn-Lethbridge line. The extension from Pakowki to the Alberta-Saskatchewan boundary, where track from the east at present terminates, is under construction. Tracklaying on this extension was reported to have been started Oct. 12.

British Columbia District.—It is reported that the Connaught Tunnel, on the main transcontinental line at Rogers Pass will be opened for traffic Dec. 1.

The Board of Railway Commissioners has authorized the company to use the following bridges erected on its Kootenay central subdivision recently, viz.: over Columbia River, mileage 94.26; over Kootenay River, mileage 38.7; over Bull River, mileage 9.2; over Findlay Creek, mileage 59.8; over Skookumchuck Creek mileage 46.62.

In connection with the increasing of the company's dock accommodation at Vancouver, F. W. Peters, General Superintendent, is reported to have said, Oct. 7, that the extension of the present pier is merely the quickest means of providing additional facilities and does not in any way conflict with the original plans for the construction of Pier B, which is now projected. The extension of Pier A to the harbor line merely means that this work will be done first in order to provide additional berths and warehouses for trans-Pacific business.

The construction of Pier B as originally planned will not in any way be interfered with. The general plans provide for the building of piers lettered from A to G, and they will all be provided as business requires. It is also the company's intention to remove the old detention shed and make improvements at Pier A by building an extension on to the east end of no. 1 freight shed. Pier D is filled out to the harbor line and marked for quite a distance of the 400 ft. addition by dolphins. The lines of construction for the addition will be in conformity with the style of the present pier, which is of steel framework. The extended pier will provide accommodation for three or four of the company's ocean water vessels. (Oct., pg. 403.)

Steel Rails and the Customs Duty.

Canadian Railway and Marine World for October contained a press dispatch from Ottawa stating that it was understood that an arrangement had been made with regard to supplying rails required by Canadian railway companies which would satisfy temporarily the urgent requirements of the various railway systems. No definite announcement has been made as to the terms of the arrangement. We understand that some weeks ago the Canadian Northern Ry. represented to members of the Dominion Government that it was unable to procure rails from Canadian mills for prompt delivery for important work and made a request that the duty be suspended temporarily so as to enable it to bring in a moderate tonnage. It is said that the C.P.R. made similar representations.

Both the Algoma Steel Corporation and the Dominion Iron & Steel Co. are running practically all the time on steel bars for the Imperial Munitions Board, the Board having told them that it expects to get practically their entire outputs for the next six months to come.

It is said that the C.P.R. has not purchased any rails in the United States as yet, and may not do so, as it may be able to secure a small tonnage in Canada for early shipment. One reason for its not having placed an order in the U.S. probably is that it is impossible to obtain open hearth rails there for delivery earlier than Sept. or Oct. 1917, and the C.P.R. will not use any other grade. It is possible the Canadian Northern may bring in some Bessemer rails from the U.S., it being possible to secure them for fairly early delivery, provided the Canadian customs duty is temporarily suspended.

Canadian Pacific Railway Company's Annual Meeting.

At the annual meeting in Montreal, Oct. 4, the President and Chairman, Lord Shaughnessy, in moving the adoption of the report for the year ended June 30, which was published in Canadian Railway and Marine World of October, said:

"The information contained in the report with reference to the outcome of the company's operations during the year, and the condition of its affairs generally, must be as gratifying to the shareholders as it is to the directors. While the gross income from the business of your railway lines was below the maximum that had been reached, the net revenue was in excess of any previous year. The statements and statistics give evidence of improved operating effectiveness and of greater financial strength and stability.

"Although the amount of the taxes that the company may be called upon to pay in Great Britain and Canada in connection with special war assessments is not as yet definitely determined, it will, no doubt, be considerable, and prudence suggests preparation to meet it. Then, as you are aware, most of your ocean steamships have during the past two years been engaged in Admiralty service. Some of them were lost, although in this respect we have been singularly fortunate, some were taken over by the Admiralty, and the character of the service that the others have been performing will make extensive rebuilding necessary whenever the steamships are released. To make provision for these excess war profit taxes and other war assessments that the company may be required to pay, and for the rehabilitation of your ocean fleets at the prices now current and that are likely to prevail for some time to come, the directors decided to transfer to a fund for contingencies a very substantial sum that would in other circumstances have gone to special income. I am confident that this policy will meet with your hearty approval.

"It is very comforting to know that on June 30 last the cash in hand, including the temporary investment in war loans, readily convertible, was nearly \$47,000,000, or about \$20,000,000 more than at the end of the previous fiscal year, although of any description had been disposed of, but, of course, important works requiring large expenditure, that were not immediately necessary, were postponed until a more opportune time. In addition to the cash in the treasury you have available for sale upwards of \$40,000,000 of 4% consolidated debenture stock for additional railway mileage built with funds advanced by the shareholders.

"In the opinion of the directors the time has arrived when the company should arrange to carry its own fire and marine insurance, or the greater portion of it, instead of paying large annual premiums as at present. To that end, a transfer of \$231,000 was made to the fund last year, and further transfers will be made year by year until the fund is sufficient for the purpose in view.

"In Eastern Canada the outcome of farming operations this year was generally satisfactory, but the grain crops in portions of the western provinces were injuriously affected by unfavorable weather conditions during the late summer, and it is now thought that the total yield will be little more than half of last season's phenomenal crop. These conditions

will naturally be reflected in the company's revenue returns during the next year, but general business is showing decided improvement, and in any event there is every reason to expect that the company's net income for the year will be quite sufficient to meet the ordinary dividend distribution without encroaching on the surplus of previous years.

"The progress and prosperity of your company during the past few years tempted other railway companies to enter the field, and they received encouragement and support from the Dominion and provincial governments in the shape of cash bonuses and guaranteed securities, with the result that hundreds of millions of dollars were invested in railway lines throughout Canada, many of them in territory already served by your railway, years before they were required or could be made self sustaining. It has been necessary for the government on more than one occasion to come to the aid of these companies by advancing large amounts of money to prevent liquidation and collapse. As a consequence, a situation fraught with some anxiety and apprehension has developed. Within the last few months a board of inquiry, composed of expert and capable men has been selected by the Dominion Government to study every phase of the railway problem, and to make a report incorporating suggestions and advice that may serve to guide the Government in dealing with the subject hereafter. It is to be regretted that a board of this kind was not asked to give information and advice before these large expenditures and obligations were incurred, rather than afterwards, but there is little doubt that its report and recommendations will be very useful to Parliament and the Government.

"I cannot too highly commend the vice presidents and their assistants for the splendid organization, the intelligence and energy that were manifest in every branch of the company's service, and to which may be attributed the very gratifying outcome of the year's business.

"The vacancy in the board of directors caused by the death of Sir Sandford Fleming has not been filled. Your directors recommend that Sir Vincent Meredith, Bart., be elected a director to fill the vacancy, and his name will appear on the ballot paper to be submitted to you today."

Prior to the adoption of the resolution approving of the report, Huntly Drummond, a shareholder, stated that he desired on behalf of the shareholders to express their gratification at the satisfactory results of the year's operations, which could only be attributed to the wisdom and foresight exercised by the President and the remarkable esprit de corps which was known to exist throughout the company's service. He also referred to the enormous assistance the company's organization had been in matters connected with the prosecution of the war and to the generosity of the company and its employees in their contributions to the patriotic fund and for other war purposes. He concluded his remarks by referring to the anxiety that was felt amongst the shareholders at rumors which had been current for some little time past of the possibility of the retirement of Lord Shaughnessy from the presidency. He stated that in his opinion,

which he felt was generally shared, it was of vital importance that Lord Shaughnessy should continue to direct the company's affairs and suggested, if he was not on too delicate ground, that it would be very reassuring to the shareholders if Lord Shaughnessy would make some statement on the subject.

Lord Shaughnessy, after thanking Mr. Drummond for his expression of appreciation, stated that there were two factors to be considered in the selection of a president, namely, the board of directors and the person who might be named, but that if the directors at the meeting to be held after this meeting were to ask him to be President of the company he would be very pleased to accept, and that if a year from now they again proposed that he should be President, he would be very glad to serve. He did not think any man at his time of life should predict beyond two years. The President referred to his 34 years connection with the company, 17 of them as President, and the splendid organization which the company possessed and in which he personally took much pride. He mentioned that many of his assistants and advisers on the staff had been with him from the beginning. Indeed, some of those now holding positions of greatest responsibility he had known when they started as boys in the company's service. He assured Mr. Drummond and the shareholders that so long as he was mentally and physically capable his services would always be at their command.

His reply was received with loud cheers.

The following resolutions were unanimously adopted:

Toronto, Hamilton and Buffalo Ry.—
Whereas an agreement has been entered into, dated Feb. 1, 1916, between the Toronto, Hamilton & Buffalo Ry. Co., the Michigan Central Rd. Co., the Canada Southern Ry. Co., the New York Central Rd. Co., and this company, providing for the interchange of traffic between the several companies parties to the agreement and for the issuance from time to time by the Toronto, Hamilton & Buffalo Ry. Co. (but only with the consent in writing of the Michigan Central, Canada Southern, New York Central and Canadian Pacific Companies) of bonds not exceeding in the aggregate \$10,000,000, bearing interest not exceeding 5% per annum, such bonds to be secured on the property and assets, present and future, of the T. H. & B. R. Co., subject however to the mortgage dated June 1, 1896, and to be unconditionally guaranteed by the Michigan Central, Canada Southern, New York Central and Canadian Pacific Companies, the said agreement providing that if the earnings of the T. H. & B. R. Co. are not sufficient to provide for the payment of any of the interest on the bonds, the deficit shall be borne by the other companies parties to the agreement in the proportions therein mentioned; now therefore be it resolved that the said Agreement be approved and the execution thereof by the President and Secretary of the company be ratified and confirmed.

Canadian Pacific Ocean Services, Ltd.—
Whereas by resolution passed at the annual meeting of shareholders on Oct. 6, 1915, the sale of the shares of the Allan Line Steamship Co. held by this company and the transfer of the several

NOVEMBER, 1916.]

CANADIAN RAILWAY AND MARINE WORLD.

steamships named in the schedule attached to the resolution and other property therein mentioned to the Canadian Pacific Ocean Services, Limited, was ratified and confirmed to be effective from Nov. 1, 1915, or from such later date as the directors might determine; and whereas by agreement dated Dec. 7, 1915, approved by the directors on Dec. 13, 1915, the effective date of such sale and transfer was deferred to a date to be fixed by agreement between this company and the Canadian Pacific Ocean Services, Limited, and the last named company was appointed manager and agent to operate and manage the steamships of the Allan Line Steamship Co. and of this company; And whereas the conditions pertaining to ocean traffic may render it desirable in the company's interests that in giving effect to the proposals previously approved a somewhat different plan should be adopted, and it is desirable to authorize and empower the directors to take such action as may be deemed advisable in the premises; Therefore, be it resolved that the agreement dated Dec. 7, 1915, providing for the operation of the fleets of this company and of the Allan Line Steamship Co. by the Canadian Pacific Ocean Services, Limited, as manager and agent, be ratified and approved. And be it further resolved that the directors be and they are authorized to give effect to the resolution passed at the last annual meeting relating to the sale of the shares of the Allan Line Steamship Co. held by this company and the transfer of the several steamships and other property therein mentioned by completing the sale and transfer therein authorized either to the Canadian Pacific Ocean Services, Limited, or to some other company created for that purpose in which this company shall have full ownership and control, in such manner and at such times and upon such conditions as to them seem proper.

Bylaw 91, which names the officers of the company authorized to prepare and issue tariffs of the tolls to be charged for the carriage of freight amended by the substitution of the name of H. D. Macdonnell for that of W. B. Bulling, as Assistant Freight Traffic Manager, Eastern lines.

The three retiring directors, G. Bury, W. D. Matthews, and A. M. Nanton were re-elected for one year. Mr. Meredith, President Bank of Montreal was elected a director for 4 years to succeed Mr. Bulling.

At a meeting of directors held immediately after the shareholders' meeting Lord George Bury, Vice President, and E. W. Beatty, K.C., Vice President and General Counsel, and the following were appointed the executive committee: R. B. Angus, E. W. Beatty, K.C., George Bury, Sir Herbert S. Holt, Sir Edmund B. Osler, M.P., Lord Shaughnessy.

Board of Motion Pictures.—The Ottawa Court of Revision decided, Oct. 13, that the salaries of members of the board of motion pictures of the city. The decision was the result of an appeal made by D'Arcy Scott, Assistant Chief Corporation Counsel, and the board of the motion picture industry, on the part of the city and the Government, by which the city agreed to make no claim for taxes on the income of officers and members of the Government derived from the Government.

Resumption of Grand Trunk Preference Dividends.

After an interval of two years the G.T.R. has resumed payment of dividends on part of its preference capital. For 1913 the full dividends, interim and final, were paid on its first and second preference stocks, while 2½% was distributed on its third preference stock. For 1914 and 1915, nothing was paid on any of the preference stocks, while for 1916 only 1½% was paid on the first and second preference stocks.

Thanks to the considerable improvement in earnings this year, the directors, while paying the full interim dividend of 4% per annum on the guaranteed stock (as against only 3% per annum a year ago), are able to recommend an interim dividend of 1½% per annum on the first preference stock.

The directors are also empowered to pay a dividend of 1½% per annum on the second preference stock, and to pay a dividend of 1½% per annum on the third preference stock, subject to the net receipts of the parent company in the year. The directors are also empowered to pay a dividend of 1½% per annum on the first preference stock, and to pay a dividend of 1½% per annum on the second preference stock, and to pay a dividend of 1½% per annum on the third preference stock, subject to the net receipts of the parent company in the year.

No doubt had they deemed it prudent to do so the directors could have distributed a dividend of 1½% per annum on the first preference stock, and to pay a dividend of 1½% per annum on the second preference stock, and to pay a dividend of 1½% per annum on the third preference stock, subject to the net receipts of the parent company in the year.

until the results for the completed year are known. As regards the payment of dividends on the junior preference issues, the directors are empowered to pay a dividend of 1½% per annum on the first preference stock, and to pay a dividend of 1½% per annum on the second preference stock, and to pay a dividend of 1½% per annum on the third preference stock, subject to the net receipts of the parent company in the year.

progress, though the gain in net profits

in July was small in proportion to the expansion in gross receipts. However, the net earnings of the main line for the entire year should show a considerable improvement, and as the parent company will not have to make good heavy deficits of its subsidiaries, as in 1915, there ought to be a considerable amount available for distribution on the company's preference stock after additional capital charges have been provided for.

Toronto Terminal Railway Co's Annual Meeting.

The adjourned annual meeting of the Toronto Terminal Ry. Co. was held at the G.T.R. general offices, 1100 St. Lawrence St., H. G. Kelley, President, presiding. Good progress was made in the distribution of

the company's assets, and the directors were authorized to pay a dividend of 1½% per annum on the first preference stock, and to pay a dividend of 1½% per annum on the second preference stock, and to pay a dividend of 1½% per annum on the third preference stock, subject to the net receipts of the parent company in the year.

Directors were elected as follows: George Bury, I. G. Ogden, and E. W. Beatty, K.C., and the following were appointed the executive committee: R. B. Angus, E. W. Beatty, K.C., George Bury, Sir Herbert S. Holt, Sir Edmund B. Osler, M.P., Lord Shaughnessy.

Grain in Storage at Terminal Elevators. Decrease Reported Since Last Year.

Co.

Commission of Enquiry into Railways and Transportation.

The Chairman of the commission, A. H. Smith, President of the New York Central Lines, and Sir Henry Drayton arrived in Ottawa Oct. 8, on their return from an inspection trip over Canadian Northern, Grand Trunk Pacific and National Transcontinental lines as far as the Pacific Coast.

William Mitchell Acworth has been appointed a member of the Commission, in succession to Sir George Paish, who was compelled to relinquish the appointment on account of ill health. He was born near Bath, Somersetshire, Eng., Nov. 22, 1850. He is a barrister, M.A. (Oxon), and was a member of the London County Council from 1889 to 1892, and was a candidate for Parliament for the Keighley Division of Yorkshire in 1906, 1910 and 1911. Following are a list of committees connected with transportation of which he has been a member:—1895, Board of Trade Committee on Light Railways; 1899, Royal Commission on Accidents to Railway Servants; 1906, Vice Regal Commission on Irish Railways, and Committee on Railway Accounts and Statistics. He is a member of the council of the Royal Economic and Royal Statistical Societies, and of the executive committee of the Tariff Reform League, and Chairman of the London United Tramways Co. He is the author of several works on railways, including Railways of England, 1889; Railways of Scotland, 1890; Railways and the Trader, 1891, and Railway Economics, 1905. He was, from 1895 to 1904, lecturer on Railway Economics at the London School of Economics.

The Commission's Staff.

As stated in a previous issue, no information is obtainable from the commissioners as to the staff employed. As already announced, Prof. G. F. Swain and W. H. Chadburn have been brought in from the United States. Prof. Swain is apparently not spending much time in Canada, but is directing the work from Boston, Mass., W. H. Chadburn being his principal assistant at Ottawa, while A. Buchanan, formerly of the New York Central Lines, is looking into rolling stock questions. W. P. Kellett, who was Chief Engineer of the Lake Erie & Northern Ry. during most of its construction, and who is now President of the Dominion Steel Products Co. at Brantford, Ont., has been engaged in connection with the engineering work and is going to inspect the lines to the Pacific coast. A. H. N. Bruce, M. Can. Soc. C.E., formerly Chief Engineer, Quebec & Saguenay Ry., is said to have also been appointed on the engineering staff.

Geo. F. Swain's record is as follows:—Born, Mar. 2, 1857, in San Francisco, Cal. Graduated in 1877 from Massachusetts Institute of Technology, Department of Civil Engineering. Studied in Polytechnic School at Berlin, 1877, 1880. 1880-1884, hydraulic expert, 10th United States Census. 1887-1907, Professor of Civil Engineering, Massachusetts Institute of Technology, in charge of the department. 1909 to date, Gordon McKay Professor of Civil Engineering, Harvard University. 1887-1914, Consulting Engineer, Massachusetts Railroad Commission. 1894 to date, member Boston Transit Commission; since June, 1913, Chairman of the commission. 1904, member of commission to revise building laws of City of Boston. 1908, member, National Con-

servation Commission. 1911, member joint commission to consider and report on transportation improvements in Metropolitan District, including steam and electric railways, and port developments. 1910, expert employed by State Board to validate assets and liabilities of New York, New Haven & Hartford Rd. 1911, made valuation of New York Central Rd., 1912, expert on valuation of Chicago Elevated Railways; also made valuation of two small railways. During the last 20 years he has been consulting engineer for a large number of engineering projects, having designed and superintended construction of quite a number of bridges of various types. Has been expert in quite a number of cases involving bridges, railway matters, docks, and other engineering problems. Has also been a member of a large number of special commissions, including 15 or 20 commissions appointed to decide manner and apportion the cost of abolishing grade crossings of highways and railways, including a considerable number of large projects, such as those at Worcester, Waltham, Taunton, Newton, Somerville, and many other cities and towns in the United States. 1913-1914, Consulting Engineer for City Cincinnati on project for subways. Has also been employed by various States and municipalities on engineering projects of various kinds. 1916, member of board of arbitration on plan for reconstruction of Galveston causeway. 1913, President, American Society of Civil Engineers. Is a member of the American Society of Mechanical Engineers, American Institute of Consulting Engineers, Canadian Society of Civil Engineers, Institution of Civil Engineers of Great Britain, Society of Engineers and Architects, Hanover, Germany, Boston Society of Civil Engineers (Ex-President), American Railway Engineering Association, American Society for Testing Materials, and many other professional societies.

The following memorandum has been issued from the Prime Minister's Office in Ottawa:—"The government are in receipt of many communications which have reached them in consequence of a circular issued by the Canadian Society of Civil Engineers on Sept. 7, copy of which is hereto appended. [Editor's Note.—This circular was published in Canadian Railway and Marine World for October.]

"It is the policy of the government to employ Canadians for all public purposes; but having regard to the magnitude and seriousness of the questions which confront the government with regard to the railways, they have not been disposed to dictate to the commissioners in the selection of the best available assistance on this continent or elsewhere. Indeed the government could not expect the commissioners to undertake the very arduous and important task which has been set before them, unless they were given a free hand in such matters. The Prime Minister has called upon Sir Henry Drayton for a full report in respect of the matters set forth in the Canadian Society of Civil Engineers' circular, and that report has just been received. A copy is hereto appended."

Sir Henry L. Drayton's Report.

The following letter from Sir Henry L. Drayton, K.C., Chief Railway Commissioner for Canada, and one of the Commissioners of inquiry into railway and transportation, was dated: "On Private

Car Acadia, Port Arthur, en route west, Sept. 19," and addressed to Sir Robert Borden.

"A copy of the circular of protest issued by the Canadian Society of Civil Engineers on the question of the appointment of Prof. Swain, of Harvard University, who is an American engineer, has been forwarded to me. In case you have not already got one, I enclose copy herewith. I understand, rightly or wrongly, that some 3,000 of these circulars have been issued; and, as the object of the circular is to have all those circularized write the members of parliament and to take up the question with those whom they believe to have influence in Ottawa, I have no doubt that the question is one which will be called to your attention with more or less regularity and insistence. I, therefore, think that while the appointment by the commission of investigation of their assistants is of necessity a matter for that commission, and that no apologies are required for the appointment of Prof. Swain, it is but fair that I should write you my position in the matter. The question was first brought to my attention by R. A. Ross, an electrical engineer of much eminence, with whom I have been personally associated in the past in connection with hydro electrical matters. At the outset, I desire to say that I have a very high opinion of Mr. Ross' engineering skill and knowledge and honesty of purpose. He writes:—

"As you are the only Canadian on that board and I am an engineer without knowledge of railway matters and therefore free to speak without my motives being misunderstood, I may say that it has been common practice in Canada whenever investigations were carried on which were really worth while taking up, to call in foreign engineers and that I sincerely hope that your board is not going to continue this practice which will result in a horde of probably several hundred American engineers being landed in this country to do work for which our Canadian engineers are better fitted both by training and actual experience. Canadian engineers can and do go to the States and obtain a preference there because they are Canadians and are well trained and reliable and there is abundant material still in this country to cover the present requirements. At the present there are many engineers out of work in Canada and who have had to go to the States for the same reason or who have enlisted, all of whom are our own citizens who will have to bear the burden not only of war costs but of the railways at present under consideration. Of course I realize that this dispatch may not be correct, but previous actions of the governmental bodies have indicated the possibility of its truth, hence this protest to the only Canadian member of the board. May I also add that from what I hear the personnel of the board itself appears to be thoroughly acceptable to every one and personally I wish you every success in this very important undertaking."

"I am entirely free to admit my personal preference in favor of the local men, many of whom I know and have come in contact with in business. It occurs to me, however, that in a position of the present magnitude, and, indeed, as a matter of common duty, the only proper thing to do is to ignore all personal predilections, acquaintances, and the like, and get the best men available, whoever they may be. The question is certainly large enough and the urgency sufficiently real. Every consideration was given Mr. Ross' letter before Prof. Swain's appointment was made. I note that the circular refers to his appointment as a particularly flagrant case. I, therefore, should say something about him. Strangely enough, he happens to be a member of the protesting society. He became a member in Jan., 1913, being himself at the time President of the American Society. I should also say that he is a member of many years' standing of the

British Institution of Civil Engineers.

"The circular states that competent constructing and operating engineers have been passed over in favor of alien engineers. Prof. Swain has not been appointed for any such work, or for advisory work as to the methods of construction or methods of operation. Rightly or wrongly, the commission thinks that, in order to report properly to parliament, some knowledge should be had as to what the actual investment in railways means, and what the physical value of the lines under consideration, to the extent possible in view of the limited time available, is. No general valuation has ever been made in Canada, although in a few instances I believe it to be a fact that railways, for their own purposes, have made partial valuations. The question is a particularly complicated one, the mere compilation of necessary data, scales, etc., entailing the expenditure of a large sum of money, the employment of a comparatively large staff, and some six months of time itself. Prof. Swain is thoroughly familiar with this work and had much data already in hand and available. Under the United States legislation of 1913, the duty was thrown on the Interstate Commerce Commission of making a physical examination of American lines, and the work, merely preliminary, in 1914 cost \$456,565. In 1915, the cost amounted to \$2,131,935. It has been stated that the actual work of valuation will take upwards of 10 years and will cost millions of money. No such work, of course, has ever been undertaken in Canada. In so far as the railways themselves are concerned, as the result of inquiry, the only valuation that I can find that was made in detail was one which was made in 1910-11 by the C.P.R. for a portion of its line. That company has always been looked upon as a characteristic Canadian company and is noted for its praiseworthy policy of employing Canadians wherever possible. The work, however, being entirely new in Canada, I find that in this instance, the Canadian Pacific itself went to the States for engineers who had the necessary experience to do the work. So far as Prof. Swain is concerned, he has been in touch with this work since its inception in the States, and, without going into details of his work, it is sufficient to state that in 1910-11 he was in charge of the valuation of the physical properties of the New York, New Haven & Hartford Rd., and in 1911-12 of the New York Central Lines.

"Over and above all this there is the obvious objection to the appointment of a Canadian engineer which the circular itself recognizes. It states:—

"It may be argued in support of the present alien appointment that Canadian engineers are not acceptable because many have been in the employ of the railway companies. To this we would reply that, as the commission itself is to advise the government, basing itself upon the engineering data given to it, any experienced engineers are competent to collect and submit the necessary information to the commission."

"In so far as the answer is concerned, if the information supplied to the commission by an engineer was formed from an improper basis, it certainly would be of no use unless acted upon by the commission, and if acted upon by the commission would be just as objectionable as if made by the engineer to the government itself. The circular might have gone further in its statements and frankly admitted that all Canadian railway engineers of standing have been some time or other, or are now, in the employment of railway companies. A glance at the members of the council issuing the circular will show how neces-

sary the admission that the society makes, was. There are on the council two Canadian Pacific engineers, two Grand Trunk engineers, two Canadian Northern engineers, as well as engineers on the Intercolonial or National Transcontinental systems. Taking any of the council's representatives in so far as the members interested in railway work are concerned, their connection in the past or present with the Canadian lines is beyond all doubt. Besides the matter of public interest in having an entirely unprejudiced report, the interests of the companies themselves must be considered. A valuation, for example, of Canadian Northern properties by a Canadian Pacific engineer, committed to Canadian Pacific standards and grades by his own work, and in full sympathy with Canadian Pacific policies, would be absolutely unfair. The same can be said of engineers of either of the other roads, all of whom have a natural bias in favor of their own work, and an honest conviction at that. Much depends upon the point of view. The valuation of a given property may show startlingly different results arrived at by engineers whose experience and work, and resultant convictions and prejudices—never mind how honest they may be—have differed one from the other.

"The circular is of course in error where it says that an American engineer is appointed as the commission's advisor. He is not. His work is simply to look after the matter of physical valuation as nearly as may be, and that in itself is an all sufficient task. I feel somewhat keenly the position—not in the slightest degree personally, but in the interest of the public service. To my mind, the present occasion is a pretty good illustration of what is very largely relied upon by those opposed to public control and service of utilities—that is, that it is impossible that they would be conducted on business lines and as a matter of business. Personally, I have not found it so in the past. No such difficulties were raised, for example, when I acted as a commissioner of the Hydro Electric in Toronto, where the conduct of the business was left entirely in the hands of those responsible for it.

"This circular, however, requests each member to write:—1. To his representative in the Dominion Parliament, whether government or opposition, setting forth the facts of the case in a strong way, and pointing out that this is merely an incident in a long course of similar procedures. 2. To write in a similar vein to those having influence with the government in his own community or elsewhere. 3. That wherever similar incidents are brought to his attention he voice a protest, giving the facts to his local branch of the Canadian Society of Civil Engineers, or to the Secretary at Montreal, in such a manner that the council may deal therewith. 4. That he do not delay acting in this matter as above outlined, but proceed today to do what he can to bring every pressure to bear in every direction for the good of the engineering community in Canada.

"I, of course, do not know whether the action of the society was instigated by a disappointed applicant, whether it was initiated by the railways for their own purposes, or whether it was launched in the very best of faith. Personally, I believe it to be launched in the best of faith, but without any consideration of the immediate issue and the necessity of the present emergency. It would be difficult to imagine a more complete initiation of

an attempt to achieve a result by political influence. I do not know why railway accountants or any body of men engaged in railway work could not, with equal propriety, circularize complaints and insist upon the employment of some of their members on an inquiry, which after all, is only necessary in view of a railway situation, the result at least in part of the work of those engaged in construction of railways in Canada. The work is, of course, merely temporary. Only Canadians should in my view be appointed to permanent government positions, which I believe to be the rule in the States; but, so far as temporary work and advisory work is concerned, if proper results are to be obtained, the best man ought to be got irrespective of his parish, province, or country; and a great hurt will be done to public ownership and administration in Canada if campaigns such as that now undertaken are to flourish in the future."

"No Canadian Need Apply."

Under the above heading, the Toronto Globe said recently:—"There are two dangerous conditions symptomatic of national weakness which Canada should endeavor to avoid. Canadians should resist on the one hand every tendency towards smug complacency and self exaltation, and on the other hand the no less pernicious practice of self depreciation. Judging by recent happenings, Canada seems to have passed the first stage, and is now in serious danger of stultifying herself in the eyes of her neighbors by underestimating the worth of her own citizens. Has this country gone so far down in the scale of values as to pass by Canadians in favor of outsiders in public appointments in which expert knowledge and honor are the chief requirements? In criticizing the action of the Government in passing over Canadian civil engineers in favor of Prof. Swain, of Harvard, when selecting the personnel of the commission investigating the Canadian railway situation, the Globe has no intention of criticizing Prof. Swain, who stands so high in his profession. What compels criticism in this case is a government memorandum which adds insult to injury, so far as civil engineers in Canada are concerned. There is nothing in either the magnitude or seriousness of the question under investigation that justifies this undeserved slur cast upon the professional reputation and honor of an intelligent body of Canadian citizens. There are in the Dominion civil engineers second to none on this continent in professional standing, outside those connected with the various railway interests. Is it contended, then, that in all Canada no civil engineer can be found who will give an impartial and reliable report on the railways, free from the taint of political or railway influence? Is there not one righteous civil engineer in all Canada to whose honor this task could safely be entrusted? The question has only to be asked to show the absurdity of the government attitude in refusing to appoint a Canadian engineer instead of an imported expert. Toronto's experience does not bear out the Government's fears. W. T. Jennings, a former C.P.R. engineer, combatted railway aggression fearlessly when in the service of this city. Some more intelligible excuse will have to be found for this unjust slight upon the engineering profession of Canada."

The foregoing shows how impossible it is for the daily press to discuss any public matter without introducing politics. The Globe has fallen into two errors, first in saying that Prof. Swain

is a member of the commission appointed to enquire into railways and transportation, and second that he was appointed by the government. The commission, as frequently stated in these columns, is composed of A. H. Smith, President New York Central Rd., as Chairman, and Sir Henry Drayton, Chief Railway Commissioner. The third member appointed, Sir George Paish, of London, Eng., is not able to act, owing to ill health. Prof. Swain has not been appointed by the government, but by Messrs. Smith and Drayton. Their defence of the appointment is given in Sir Henry Drayton's letter to the Premier, reproduced above, and the government has taken the ground that it cannot interfere with the commission's appointments.

Comments by R. A. Ross, M.Can.Soc.C.E.

In a letter to a U.S. paper R. A. Ross, M.Can.Soc.C.E., Montreal, says in part:—

"As regards the case in point, it is one of a series of similar appointments made by the Dominion and Provincial Governments which have hitherto called forth merely desultory criticism by individual members of the Canadian Society of Civil Engineers. In this case (a particularly flagrant one in the opinion of all) it was decided that united action should be taken, not, be it noted, so much against American engineers as such, nor at all against Prof. Swain, but against the Government's total neglect of Canadian engineers. The action is intended as the opening gun of a campaign to force a recognition of the engineer on our lawyer politicians. In dealing with the matter we first met Prof. Swain at a small dinner in his honor at Montreal, and laid before him our intended programme, in which his case was a mere incident, pointing out that we had no criticisms to offer as to his attitude, as we would all be ready to act for the Government of the United States should that Government decide to call in Canadian engineers for advice—a thing, by the way, which has never happened and never can happen, owing to the legislation against such appointments.

"We entirely agree with the ethics of high thinking and plain living, and have held that position up till recently without complaint, although the plain living has become plainer, especially during the last three years; but at last we have awakened to the fact that the game is not played in that way, and that the admonition is not for practical use, but only for application to others—and we apparently are the others. The Canadian engineer is not surrounded by carefully constructed wire entanglements of defensive laws, and has had to fight in the open against all comers—and they have come in recent years in ever-increasing numbers. We are therefore in the position of a nation of avowed free traders who find that the other fellows are protectionists, and that in order to obtain, not the free trade which they desire and have always upheld, but merely a fair trade, they must take such action as will provide at least the less desirable alternative. How far we may ultimately find it advisable to go in the direction of much disliked protection we do not know, but the present situation is not as yet connected with a demand for legislation, being designed merely to discourage the calling in of outsiders where such necessity does not exist. As a matter of fact, the engineer in this as in other countries resents his position under the domination of the politician and proposes to make himself felt,

"The decision of the Society's council was unanimous, and as to the membership in general the only criticisms we have heard are from four U.S. members. This unanimous approval of Canadian members must indicate clearly that the matter is not a new question, but has been drilled in during past years by experience of governmental action, and indicates a well-grounded body of opinion endorsing the action of the council. The American engineer in question is a member of our society, and a valued one. A large number of Canadians are members of American societies and yet require a special act of Congress for each case to permit of their doing Government work. May it be pertinent to inquire what would be the attitude of the American societies toward any American Government which preferred Canadians, and passed over without consideration their own countrymen, or undertook to remove the legal restrictions imposed on alien engineers in the U.S.? The foregoing question does not appear pertinent to such confirmed free traders as ourselves, as should we later obtain such protection as exists for engineers in the U.S. we might be able to swap advantages and both return to that ethical plane which we may be forced reluctantly to abandon in the not distant future, as our campaign for the recognition of the engineer develops."

The Canadian Society of Civil Engineers' British Columbia Division, at a meeting held recently, decided to appoint a delegation to interview Sir George Foster, Minister of Trade and Commerce, and Hon. Martin Burrell, Minister of Agriculture, during their visit to that city and lodge a strong protest against "the policy of placing in the hands of aliens the engineering work of a commission appointed by the Canadian government to investigate Canadian railways." R. S. Hayward, President of the Vancouver branch, was in the chair, and a number of addresses were delivered strongly condemning the action of the government in awarding such an important post to one who was not a British subject when there were equally competent British engineers available to undertake the work. A strong case was outlined to be laid before the two ministers.

Freight and Passenger Traffic Notes.

The Grand Trunk Pacific Ry. has removed its divisional point from Wainwright to Edmonton, Alta.

The C.P.R., on Oct. 5, increased its first class saloon passenger rates from Vancouver to Hong Kong from \$225 to \$250.

C.P.R. lines centering on Lethbridge, Alta., are reported to have shipped this year 1,318,000 lbs. of wool, the produce of 84,000 sheep.

The C.P.R. put in operation an additional train on its Calgary-Edmonton line Oct. 29. It leaves Calgary at 13.20 o'clock, and the corresponding south-bound train leaves Edmonton at 17 o'clock.

The North Pacific Coast Passenger Agents' Association held its regular quarterly meeting at Victoria, B.C., Oct. 10. C. R. Jenney, General Agent, Passenger Department, G.T.P.Ry., Vancouver, being Chairman.

The C.P.R. has offered special rates on cattle returned from Winnipeg, Saskatoon, Moose Jaw, Calgary and Edmonton

to country points for feeding during the winter. The object is to enable farmers to utilize their surplus foodstuffs.

The Reid Newfoundland Co. is now operating its passenger steamship service between North Sydney, N.S., and Port Aux Basques, Nfld., in both directions, on Tuesdays, Thursdays and Saturdays, instead of daily as heretofore.

The Canadian Northern Ry., on Oct. 8, discontinued its train leaving Ottawa at 7.15 p.m. for Quebec. On the same day it put on a local train from Ottawa via Joliette and Montreal, leaving Ottawa at 8 a.m., and another train leaving Montreal at 3.45 p.m. daily except Sundays.

The Grand Trunk Pacific Ry. has extended its train service on the Moose Jaw Northwest Branch from Gilroy to Riverhurst, Sask. The service is a triweekly one, leaving Moose Jaw at 10.30 a.m., Mondays, Wednesdays and Fridays, and returning on Tuesdays, Thursdays and Saturdays.

The Grand Trunk Pacific Ry. announces that during December a through tourist car service will be operated between Moose Jaw, Sask., and Toronto. Through cars will leave Moose Jaw Mondays, Wednesdays and Saturdays, to connect with the "National" leaving Winnipeg Tuesdays, Thursdays and Saturdays at 5.15 p.m. The tourist car service on the Winnipeg-Edmonton section will be augmented for the December traffic.

The Grand Trunk Pacific Ry. put its winter time table in operation Oct. 15. The triweekly service each way between Edmonton and Prince Rupert has been discontinued, and a biweekly service substituted. Trains will leave Edmonton every Sunday and Tuesday at 10.35 p.m., arriving at Prince Rupert Tuesdays and Thursdays at 5.30, and leaving Prince Rupert Wednesdays and Saturdays at 11.30 a.m., arriving at Edmonton Fridays and Mondays at 8 a.m. In connection with this alteration the company will continue a weekly service by the s.s. Prince Rupert to Alaskan points until Dec. 21. The steamship will leave Vancouver on Thursdays at 10 p.m., and Prince Rupert on Saturdays at noon, arriving at Skagway on Mondays, and starting at noon on the same day on the return trip.

Grand Trunk Track Inspection.—The annual track inspection over the G.T.R. began on the Eastern Lines Oct. 9, the party consisting of the Chief Engineer, Engineer of Maintenance of Way, general superintendents, division engineers, superintendents of track, superintendents of bridges and buildings, division superintendents, assistant engineers, supervisors of track, supervisors of bridges and buildings and supervisors of signals. The same method of inspection was followed as during the previous two years by the officers of the Maintenance of Way Department, and by use of the inspection car equipped with an electric recording apparatus, which was fully described and illustrated in Canadian Railway and Marine World for April, 1915.

Brunner, Mond, Canada, Limited has been incorporated under the Dominion Companies Act, with authorized capital of \$3,000,000, office in Toronto, and power to manufacture nitrates and similar chemical products, and in connection therewith to carry on mining, to own steam and other vessels, to build railways and tramways, canals, docks and warehouses. It is reported that the company's works will be erected at Port Colborne or Welland, Ont.

Railway Development, Projected Lines, Surveys, Construction Betterments, Etc.

Dallve-Madden Mine.—M. Albert, of Prince Rupert, B.C., is reported to have arrived in Vancouver in October to engage men to build an 18-mile mining railway from the Dallve-Madden Mine to the coast.

Dominion Atlantic Ry.—The Board of Railway Commissioners has approved of plans of new station and freight sheds at Middleton, N.S., details of which have already been published. (Oct. pg. 400.)

Dominion Government Railway to Hudson Bay.—A press report states that track has been laid to Kettle Rapids on the Nelson River, mileage 552, from Pas. Man., making 90.76 miles of track laid this season.

J. D. McArthur, the general contractor, has returned from an inspection of the work and is reported to have said that satisfactory progress had been made during the season, notwithstanding the scarcity of labor. There is no reason, he said, why the line should not be completed for traffic by the end of 1917. Oct. pg. 400.)

Edmonton, Danvegan and British Columbia Ry.—The station building at Peace River, Alta., has been completed. The general waiting room and ticket office is in the centre of the building, with the women's waiting room at one end, and a men's smoking room at the other.

Good progress is reported to have been made with grading on the 54-mile extension of the line from Spirit River to the B.C. Block. A Northwest Mounted Police officer is reported to have said in Vancouver, Oct. 10, that the grading gangs will reach the boundary line between Alberta and British Columbia by Dec. 31. (Oct. pg. 400.)

Quebec and Saguenay Ry.—Application is being made to the Quebec Legislature to incorporate a company with this title to build a tramway from Christopherson Lake on Bell River to Twenty-one Mile Bay on the Ottawa River, and from Lake Lamy to Rabbit Lake on the Ottawa River; to own and operate steam and other vessels in connection with these lines; to build telegraph and telephone lines, and to carry on a general lumbering, mining and trading business. The application is being made by G. Bryson, Jas. Bryson, Fort Coulonge, Que.; J. B. Fraser, W. H. A. Fraser, Ottawa; Geo. Gordon, North Bay, Ont.; A. B. Gordon, Toronto.

Grand Trunk Pacific Ry.—The extension of the Regina-Moose Jaw branch from Gilroy, Sask., mileage 108, to Riverhurst, about 1½ miles west of the Saskatchewan River, has been completed, and is reported to be opened for regular traffic. Grain traffic has been moved from Riverhurst since Sept. 1. (Oct. pg. 400.)

Grand Trunk Ry.—The Board of Railway Commissioners has authorized the company to use bridge 180 at mileage 122.90, district 3, Montreal subdivision, and has approved plans for a new station at Port Colborne, Ont. (Oct. pg. 400.)

Great Northern Ry. Lines in Canada.—The Vancouver, Victoria and Eastern Ry. and Navigation Co. has been authorized by the Board of Railway Commissioners to open for traffic the section of its line from a connection with the Kettle Valley line at Hope, B.C., to a connection with the Canadian Northern Pacific Ry.,

900 ft. The V. V. & E. R. runs over the K.V.R.'s Coquihalla Valley section to Hope, and then over the C.N.P.R. to a connection with another Great Northern Ry. line near the Fraser River bridge, opposite New Westminster. The opening of this piece of line gives the company a through route from Republic, Wash., to Vancouver.

The work being done in the vicinity of Coquitlam, B.C., to cut out an objectionable bend on the line into Vancouver is reported to be progressing favorably. In connection with this work the Board of Railway Commissioners has ordered the company to build a steel bridge on concrete abutments, capable of carrying a double-track line for the B. C. Electric Ry., across the line at the North Road, through which the new track is cut. The gravel and other material obtained in this area is being used for filling at False Creek. (Oct. pg. 400.)

Greater Winnipeg Water District Ry.—Tenders are under consideration for building of a locomotive shed at Waugh. Man., the Indian Bay terminal of the railway. The commissioners have under consideration a comprehensive plan for the promotion of colonization along the line.

Intercolonial Ry.—A new ballast pit has been opened at Milford, on the Halifax-Toronto section to provide ballast for

Tenders will be received to Nov. 15 for building the superstructure of the new grain elevator at St. John, N.B. The foundation work is reported to be in progress. (Oct. pg. 400.)

Niagara and Eastern Rd.—The New York Public Service Commission, on Oct. 14, refused the application of the Buffalo, Lockport and Rochester Rd. for permission to connect the Buffalo, Lockport and Rochester Rd. with the Niagara frontier, where it is proposed to build another international bridge across the gorge at the Devil's Hole. The com-

deal with the application at present. According to an Albany, N.Y., dispatch, the connecting line on the Canadian side would be a line to be built by the Canadian Northern Ry. A C.N.R. official has denied this, saying that that company was not interested in the application at Albany at all and that its repeal would make no difference to the C.N.R. plans for reaching the Niagara frontier.

Pacific Great Eastern Ry.—A press report states that plans have been prepared for the erection of a machine shop, storehouse and weigh scales at Squamish, and for the erection of a locomotive house, machine and repair shop at Lillooet, B.C., on which it is proposed to make an immediate expenditure of \$150,000. The work it is said will be started at once, and it is expected to have the several buildings completed by next spring.

Owing to the shortage of labor it is reported that but little progress is being made with grading and tracklaying between Clinton and Prince George. (Oct. pg. 400.)

Quebec Bridge. It is reported that rush orders have been placed in the U.S. for the necessary steel to complete a new suspension span to replace the one which fell into the river on Sept. 11 while it was being hoisted into position. It is

stated that the new span will be ready for placing during 1917. (Sept. pg. 364.)

Quebec, Montreal and Southern Ry.—A press report states that it is intended to replace immediately the locomotive house on Chambly Road, Longueuil, Que., destroyed by fire recently. (Jan., pg. 10.)

Quebec & Saguenay Ry.—Tenders were received by O'Brien & Doherty, contractors, to Oct. 6, for 30,000 railway ties for immediate delivery at Cap Tourmaline, Que. In connection with this we are officially advised that M. J. O'Brien of Renfrew, Ont., and Hugh Doherty of Montreal, working as O'Brien & Doherty,

over by the Dominion Government when operated as part of the Canadian Gov-

trolled by the G.T.R.

Pere Marquette Rd. Officials have completed their annual inspection of the entire system in the U. S. and Canada, upon which the award of prizes is made. The prizes consist of \$100 to the roadmaster of the division receiving the highest marks; \$25 to the foreman of the best section on each roadmaster's division; \$50 to the signal supervisor receiving the highest grade; \$100 to the master mechanic having the most efficient shops; \$25 to the agent on each division receiving the highest grade for care of buildings.

Changes in C.P.R. Signalling.—On the section of about 5 miles of double track between Place Viger and Mile End stations, Montreal, automatic signals, using direct current for track circuit, were installed about 4 years ago. This year, the track circuits have been changed from direct to alternating current, the signals and switch indicators operating by direct current as formerly. The change in the track circuit current has been made to avoid the chance of interference from stray foreign current.

Mainly About Railway People Throughout Canada.

Lord Shaughnessy sailed from New York, Oct. 25, for England.

S. J. McLean, one of the members of the Board of Railway Commissioners, has been called to the Ontario bar and sworn in as a solicitor.

Jno. McIntyre, K.C., of Kingston, Ont., who died Oct. 4, aged 73, was a brother of D. M. McIntyre, K.C., Chairman, Ontario Railway and Municipal Board, Toronto.

W. H. Grant, General Tie & Timber Agent, and acting General Store Keeper Eastern Lines, Canadian Northern Ry., has been elected President of the Toronto Curling Club.

J. T. Arundel, General Superintendent, Ontario District, C.P.R., who has been suffering from rheumatism, has been taking treatment at Mount Clemens, Michigan.

H. E. Beasley, General Superintendent, Esquimaux & Nanaimo Ry., Victoria, B.C., and Mrs. Beasley, spent a few weeks in Toronto and vicinity recently, visiting relatives.

Lt. Col. Blair Ripley, Commanding Officer, No. 1 Construction Battalion, and formerly Engineer of Grade Separation, C.P.R., North Toronto, has arrived in England with his battalion.

Hon. F. Cochrane, Minister of Railways and Canals, was presented with an oil portrait of himself, by a number of friends in Cobalt, Haileybury and Liskeard, Ont., at Haileybury, Oct. 5.

S. Parker Tuck, who died at Nelson, B.C., recently, was associated with the building of a section of the C.P.R. from Yale westward, and was in charge of the work from Lytton to Spence's Bridge.

A. S. Dawson, M.Can.Soc.C.E., Chief Engineer, and R. S. Stockton, Superintendent of Irrigation, Natural Resources Department, C.P.R., Calgary, Alta., were at the irrigation convention at El Paso, Texas, in October.

D. McNicoll, formerly Vice President, and a director, C.P.R., who, owing to illness, spent the summer at his son's ranch Penticton, B.C., has returned to Montreal where, it is said, he is to undergo special medical treatment.

A. J. Stevens, M.Can.Soc.C.E., who was in charge of the Dominion Public Works, Manitoba District, has been transferred to Windsor, Ont., to relieve H. J. Lamb, M.Can.Soc.C.E., who is in the Canadian Expeditionary Force.

Hon. John Costigan, who died at Quebec, Que., Sept. 29, aged 82, was at one time associated with the promotion of the Quebec and New Brunswick Ry. Co., which, however, carried out no railway construction, and was, for some years, until 1897, Minister of Marine.

The Ross Memorial addition to the Royal Victoria Hospital, Montreal, was officially opened by the Duke of Connaught, Oct. 11. The building has been erected and equipped by J. K. L. Ross, director, C.P.R., in memory of his father, the late James Ross, and of his mother.

A. E. Killam, formerly Inspector of Bridges and Buildings, Intercolonial Ry., Moncton, N.B., attended the annual convention of the American Railway Bridge and Building Association, of which he was Vice President, 1911-12, and President, 1912-13, at New Orleans, La., Oct. 17 to 19.

H. E. Stevens, M.Can.Soc.C.E., Bridge Engineer, Northern Pacific Ry., has been promoted to be Chief Engineer, succeeding W. E. Darling, resigned. Mr. Darling has opened an office in St. Paul, Minn., as consulting engineer, specializing in railway engineering and construction.

Sir Thomas Tait, President, Fredericton & Grand Lake Coal & Ry. Co., who resigned his position as Director of National Service recently, stayed with his mother-in-law, Mrs. G. R. R. Cockburn, in Toronto, during part of October, being accompanied by Lady and Miss Tait.

D. R. Campbell, Assistant General Manager, Pacific Division, Canadian Northern Ry., was reported to be convalescent, about the middle of October, after a sudden illness which necessitated several weeks stay in the hospital at Kamloops, B.C. He is now at his home in Vancouver.

Lt. Col. John Stewart, of Halifax, N.S., of the Canadian Army Medical Corps, who was offered the position of head of the Duchess of Connaught's Canadian hospital at Cliveden, Eng., recently, is a brother of A. F. Stewart, M.Can.Soc.C.E., Chief Engineer, Eastern Lines, Canadian Northern Ry.

Col. H. C. Mitchell, B.A.Sc., C.E., M.Can.Soc.C.E., one of the Corps of Guides, who has been at the front almost since the commencement of war, and who was previously in engineering practice in Toronto, has been transferred from the Canadian staff to the Second British Army's General Staff and has been appointed General Staff Officer. He was awarded the D.S.O. some time since.

Denis Murphy, President, Ottawa Transportation Co., and one of the Timiskiming & Northern Ontario Ry. Commissioners, who is 77 years of age, has been seriously ill at his house in Ottawa for several weeks. His son, Lt. Col. G. P. Murphy, who has been in England a good deal since war broke out, and who was appointed Quarter Master General at London recently, has returned to Canada to be with him.

Sir William Mackenzie, President, and D. B. Hanna, Third Vice President, Canadian Northern Ry., who left Toronto in August for England with several members of their families, returned to Toronto Oct. 7, having come over on the s.s. Olympic, which made a record trip to Halifax in 4 days, 15 hours. Mr. Hanna, in company with Sir Clifford Sifton, spent some days visiting the front in Belgium and France.

Neil Mooney, whose appointment as Assistant General Passenger Agent, New York Central Rd., New York, was announced in our last issue, was entertained to luncheon at Montreal, Oct. 12, by a number of transportation men in the city, and presented with a silver tea service. Prior to his present appointment, he had been General Agent, Passenger Department, N.Y.C.R. at Montreal, since Jan. 1910.

W. J. Cunningham, who has been appointed to the James J. Hill Professorship of Transportation of Harvard University, was born at St. John, N.B., April 29, 1875, and began railway work with the C.P.R. as stenographer and ticket clerk at St. John and Boston. In 1896 he entered Boston and Albany Rd. service, and has since been in the service of the New York, New Haven and Hartford,

and Delaware, Lackawanna and Western, in various capacities, and latterly was President's Assistant, Boston and Maine Rd.

A. K. Galloway, who was appointed General Master Mechanic, Northwest District, Baltimore and Ohio Rd., and Cincinnati, Hamilton and Dayton Rd., recently was born at St. Thomas, Ont., Oct. 1, 1885, and entered Michigan Central Rd. service there as an apprentice in 1902, and on completion of his apprenticeship remained there until Nov. 1, 1914, at which time he was roundhouse foreman, and was later appointed General Foreman. He subsequently transferred to Baltimore and Ohio Rd. service as Master Mechanic at Baltimore, and remained as such until his present appointment.

Royden Findlay McNaughton, whose appointment as City Ticket Agent, Canadian Northern Ry., Regina, Sask., was announced in our last issue, was born at Petrolia, Ont., June 23, 1889, and entered railway service in April 1908, since when he has been, to Oct. 1910, relieving agent, Middle Division, G.T.R., Toronto; Oct. 1910 to Nov. 1912, rate clerk, Passenger Department, Canadian Northern Ry., Winnipeg; Nov. 1912 to April 1913, chief clerk to District Passenger Agent, C.N.R., Saskatoon, Sask.; April 1913 to May 1914, Travelling Passenger Agent, C.N.R., Saskatoon, Sask.; May 1914 to Sept. 1916, Travelling Passenger Agent, C.N.R., Edmonton, Alta.

V. G. Bogue, who died suddenly, Oct. 14, on board ship when returning to New York from Mexico, had been concerned with the construction of many railways on this continent. At one time he made a report for the C.P.R. on the economics of its line between Calgary, Alta., and Vancouver, B.C., as compared with a proposed revised line, and other routes. Amongst other work carried out in Canada, he examined the report and plans for the improvement of the harbor, waterfront and railway terminals at Prince Rupert, B.C. He was a member of the American Society of Civil Engineers, and of the American Railway Engineering Association.

James Balkwill, whose appointment as Division Superintendent, Michigan Central Rd., St. Thomas, Ont., was announced in our last issue, was born in Southwold Tp., Ont., Mar. 8, 1870, and entered M.C.R. service in Mar. 1888, since when he has been to June 1889, telegrapher at various places; June 1889 to Aug. 1890, relieving agent, various places; Aug. 1890 to Dec. 1903, agent, Dutton, Ont.; Dec. 1903 to Mar. 1904, extra dispatcher, St. Thomas, Ont.; Mar. 1904 to June 1913, chief clerk to Superintendent, St. Thomas, Ont.; June 1913 to Nov. 1914, Assistant Trainmaster, St. Thomas, Ont.; Nov. 1914 to Sept. 1916, Trainmaster, St. Thomas, Ont.

J. A. Everell, whose appointment as District Passenger Agent, Canadian Government Railways, Montreal, in addition to his position as Superintendent, Montmorency Division, Quebec Ry. Light and Power Co., Quebec, Que., was announced in our last issue, was born at Cap Rouge in 1863. He commenced his transportation service as a clerk and telegraph operator with the Cap Rouge Pier and Wharf Co., and in 1889 joined the Quebec and Lake St. John Ry. staff, and was station master at Riviere a Pierre and

later at Chambord, Que. In Aug. 1889, he entered Quebec, Montmorency and Charlevoix Ry. service as dispatcher, and remained when that line became the Montmorency Division of the Quebec Ry. Light and Power Co., eventually becoming Superintendent of that division.

Alfred Erwin McMaster, who has been appointed Division Freight Agent, Grand Trunk Pacific Ry., Edmonton, Alta., was born at Perth, Ont., Oct. 22, 1885, and entered railway service in 1902, since when he has been, to May 1903, in Freight Department, C.P.R., Keewatin, Ont.; May 1903 to Aug. 1907, in various positions up to assistant agent, C.P.R., Port Arthur, Ont.; Aug. 1907 to Aug. 1908, agent, and chief clerk to Superintendent, Grand Trunk Pacific Ry., Fort William, Ont.; Aug. 1908 to July 15, 1913, agent, and General Agent, G.T.P.R., G.T.R. System, and Grand Trunk Pacific Coast Steamship Co., Prince Rupert, B.C. July 15, 1913 to Sept. 30, 1916, Commercial Agent, G.T.P.R., Regina, Sask. Prior to leaving Regina, he was entertained to dinner at the Canada Club, and presented with a case of pipes.

W. H. Sample, who has been appointed Master Mechanic, Eastern Lines, G.T.R., Montreal, was born at Altona, N.Y., Aug. 20, 1864, and entered railway service, July 20, 1882, since when he has been, to April 1886, fireman, Central Vermont Ry.; April 1886 to July 1887, locomotive man, C.V.R.; July 1887 to Aug. 1889, locomotive man, Atchison, Topeka and Santa Fe Ry.; Aug. 1889 to Feb. 1901, locomotive man, Central Vermont Ry.; Feb. 1901 to July 1906, Road Foreman of Locomotives, C.V.R.; July 1906 to Mar. 15, 1911, Superintendent of Motive Power and Car Department, Northern Ry. of Costa Rica; March 15, 1911 to Oct. 1914, Master Mechanic, Ottawa Division, Eastern Lines, G.T.R., Ottawa, Ont.; Oct. 1914 to Oct. 1916, Master Mechanic, Western Lines, G.T.R., Battle Creek, Mich.

M. G. Murphy, whose appointment as General Agent, Passenger Department, C.P.R., Detroit, Mich., was announced in our last issue, was born at Halifax, N.S., Feb. 26, 1878, and entered C.P.R. service, Mar. 31, 1899, since when he has been, to Jan. 1901, agent and operator, Atlantic Division; Jan. 1901 to 1903, chief clerk to Freight Agent, C.P.R., and agent, Dominion Express Co., Halifax, N.S.; 1903 to 1905, Travelling Passenger Agent, Atlantic Division; 1905 to June 1907, Assistant to District Passenger Agent, St. John, N.B.; June 1907 to Nov. 1, 1910, General Travelling Passenger Agent, All Lines, Montreal; Oct. 1, 1911 to Jan. 31, 1916, District Passenger Agent, Toronto covering rail and lake lines as well as ocean services; Jan. 31 to Sept. 1916, District Passenger Agent, C.P.R., and Canadian Pacific Ocean Services Ltd., St. John, N.B.

Herbert Gates Reid, who has been appointed Assistant Superintendent of Rolling Stock, Canadian Government Railways, Transcona, Man., was born at Pembroke, Ont., Oct. 27, 1863, and entered railway service in Mar., 1884, since when he has been, to Nov. 1884, wiper, C.P.R., North Bay, Ont.; Nov. 1884 to Nov. 1887, fireman, C.P.R., North Bay, Ont.; Nov. 1887 to Dec. 1905, locomotive man, C.P.R., North Bay, Ont.; Dec. 1905 to June 1906, relieving Road Foreman of Locomotives, C.P.R., North Bay, Ont.; June 1906 to Feb. 1907, locomotive man, C.P.R., North Bay, Ont.; Feb. to April 1907, Locomotive Foreman, C.P.R., Chapleau, Ont.; Sept. 1907 to Oct. 1908, District Master Mechanic, District 1, Lake Superior Division, C.P.R., North Bay, Ont.; Oct. 1908 to April 1915, Master Mechanic, Lake Superior Division, C.P.R., North Bay, Ont.; April 1915 to May 1916, Master Mechanic, Saskatchewan Division, C.P.R., Moose Jaw; May to Sept. 30, 1916, Master Mechanic, District 3, National Transcontinental Ry., Transcona, Man.

N. S. Dunlop, Insurance and Tax Commissioner, C.P.R., Montreal, has, on medical advice, resigned in order to take a prolonged rest. He was born near Almonte, Ont., Jan. 17, 1861. For seven years he was a public school teacher, and in 1886 entered a law office in Toronto, and was, subsequently, Secretary and then President of the Canadian Shorthand Society. In 1888 he entered the C.P.R. solicitors' office at Toronto, and in 1890 was placed in charge of the company's assessments and taxation in Ontario, and also had charge of garnishee matters, inquests, investigations, etc., and did the court shorthand work for the company. He was appointed Insurance and Tax Commissioner in 1892, and in 1904 was also appointed Claims Adjuster, Atlantic, Eastern and Lake Superior Divisions, which joint positions he held until 1914, when, owing to the growth of the C.P.R., his duties were confined to those of Insurance and Tax Commissioner. He was the creator of the company's floral department, which is responsible for the floral decoration of the company's stations throughout the Dominion.

Normand R. DesBrisay, whose appointment as District Passenger Agent, C.P.R. St. John, N.B., was announced in our last issue, was born at Minneapolis, Minn., May 18, 1888, and entered C.P.R. service, June 14, 1904, since when he has been, to May 31, 1905, clerk in District Passenger Agent's office, St. John, N.B.; June 1, 1905 to June 7, 1907, ticket clerk, City Ticket Office, St. John, N.B.; June 14, 1907 to Dec. 5, 1908, ticket clerk, s.s. Empress of Ireland; Dec. 5, 1908 to May 24, 1909, exchange ticket clerk, Halifax, N.S.; May 27 to Nov. 19, 1909, exchange ticket clerk, Quebec; Nov. 19, 1909, to May 4, 1910, exchange ticket clerk, Halifax, N.S.; May 5 to July 15, 1910, exchange agent, Quebec; July 15, 1910 to Nov. 1912, Travelling Passenger Agent, St. John, N.B.; he resigned that position to enter private business for a short time, and resumed his duties in the early part of 1913, and continued as Travelling Passenger Agent, St. John, N.B., until July 1914; July 1914 to Sept. 1916, General Travelling Passenger Agent, Montreal; and latterly, Chief Clerk, Passenger Department, New York.

William John Pickrell, whose appointment as Assistant Superintendent, District 1, Eastern Division, C.P.R., Farnham, Que., was announced in our last issue, was born at London, Ont., Sept. 15, 1880, and entered C.P.R. service, Jan. 3, 1900, since when he has been, to July 31, 1901, wiper and fitter's helper, Toronto; July 31, 1901 to Nov. 1, 1904, Locomotive Foreman, Toronto; Nov. 1, 1904 to Aug. 4, 1906, travelling fireman, Ontario Division; Aug. 4 to Oct. 1, 1906, locomotive man, Toronto; Oct. 1, 1906 to Aug. 1, 1907, travelling fireman, Ontario Division; Aug. 1, 1907 to April 15, 1908, Assistant Road Foreman of Locomotives, Ontario Division; April 15, 1908 to May 10, 1910, locomotive man, Toronto; May 10 to July 1, 1910, rule examiner, Ontario Division; July 1 to Oct. 15, 1910, locomotive man, Toronto; Oct. 15 to Dec. 10, 1910, rule examiner, Ontario Division; Dec. 10, 1910 to April 9, 1912, locomotive

man, Toronto; April 9 to Nov. 1, 1912 Assistant District Master Mechanic, District 1, Ontario Division, Toronto; Nov. 1, 1912, to July 29, 1913, District Master Mechanic, District 3, Ontario Division; July 29 to Oct. 18, 1913, Assistant Superintendent, District 3, Ontario Division; Oct. 18, 1913, to April 24, 1915, Assistant Superintendent, District 2, Atlantic Division, Aroostook Jct., N.B.; April 24, 1915, to Sept. 1, 1916, Master Mechanic, Ontario Division, Toronto.

George R. Martin, who has been appointed Vice President, Great Northern Ry., St. Paul, Minn., was born at Evans Mills, N.Y., July 3, 1864, and entered railway service in 1885, since when he has been, consecutively, to Jan. 1, 1887, telegraph operator and agent, Chicago and North Western Ry.; Jan. 1, 1887 to July 1890, station agent, dispatcher and chief clerk to Superintendent, Minneapolis, St. Paul and Sault Ste. Marie Ry.; July 1, 1890 to Aug. 1, 1894, in accounting department, Great Northern Ry., and from Aug. 1, 1894 to Jan. 1, 1897, Assistant Auditor of Disbursements, same road; Jan. 1 to Mar. 1, 1897, Special Superintendent, same road; Mar. 1, 1897 to Mar. 1, 1898, General Superintendent, Montana Central Ry.; Mar. 1, 1898 to Mar. 1, 1899, General Superintendent, Central District, Great Northern Ry.; Mar. 1, 1899 to Nov. 1, 1902, Auditor of Disbursements, same road; Nov. 1, 1902 to Jan. 1, 1905, General Auditor, same road; Jan. 1 to May 15, 1905, on special duty in President's office, same road; May 15, 1905 to Jan. 1, 1906, Assistant to Comptroller, same road; Jan. 1, 1906 to June 1, 1911, Assistant to Comptroller, same road; Jan. 1, 1911 to Sept. 1, 1916, Comptroller. He is also Vice President, Great Northern Steamship Co., Northern Steamship Co., Chairman of Pension Board, G.N.R., Vice Chairman G.N.R. Employees Investment Co., Comptroller, Great Northern Express Co., and of all the minor railway and other subsidiary companies of the G.N.R.

Grain Inspection at Western Points.

The following figures compiled by the Department of Trade and Commerce, show the number of cars of grain inspected on railways at Winnipeg and other points on the Western Division for September, and for 12 months ended Sept. 30, with a comparison of the number of cars inspected for 12 months ended Sept. 30, 1915.

	Sept.	12 months to Sept. 30, 1916	12 months to Sept. 30, 1915
C.P.R. Calgary.	269	7,505	6,899
C.N.R.	5,838	114,700	48,761
G.N.R. Duluth	219	15,451	1,866
G.T.P.R.	1,007	41,602	16,560
Totals	16,333	380,571	150,590

W. A. Griffiths, formerly Secretary to Manager, Department of Natural Resources, C.P.R., Calgary, Alta., and now Traffic Assistant, Gold Coast Government Railways, Secondee, West Africa, writes: "Permit me to say how much I appreciate reading Canadian Railway and Marine World month by month. Its pages are perused by other Government officers

G.T.R. Importing Machinists.—Stratford, Ont., press dispatch, Oct. 14. Scarcity of machinists at the G.T.R. shops, owing to enlistments, etc., has necessitated the importing of 25 from the United States. Woman labor is assisting, but is not by any means solving the labor problem in the shops.

Traffic Orders by the Board of Railway Commissioners.

Interchange at Moose Jaw, Sask.

25400. Sept. 11. Re the application of City of Moose Jaw for an order directing interchange facilities between the C.P.R. and Grand Trunk Pacific Ry. at Moose Jaw. Upon the consent of the Board of Grain Commissioners, the Grand Trunk Pacific and Canadian Pacific Railway Companies, and the report and recommendation of the Chief Engineer of the Board, it is ordered that the plan filed by the C.P.R., dated Moose Jaw, Aug. 12, 1916, as revised Aug. 21, 1916, showing in red the transfer tracks at the government elevator, Moose Jaw, providing for the interchange of traffic between the C.P.R. and the G.T.P.R. be approved.

25485. Sept. 30. Re application of the City of Moose Jaw, Sask., for an order requiring interchange facilities between Canadian Pacific and Grand Trunk Pacific Railways in Moose Jaw, and orders 24797, Mar. 16, 1916, and 25400, Sept. 11, 1916, made herein. Upon the consent of the Board of Grain Commissioners, the Grand Trunk Pacific and Canadian Pacific Railway Companies, and the City of Moose Jaw, and upon the report and recommendation of the Chief Engineer of the Board, it is ordered that the C.P.R. be required to construct an interchange track between its railway and the G.T.P. Ry. at Moose Jaw, and be authorized to construct, maintain and operate the said interchange track across the road allowance between Secs. 25 and 26, Tp. 16, R. 27, W. 2nd M., as shown on the plans dated Aug. 12, 1916, revised to Aug. 30, 1916, and dated Moose Jaw, Sept. 1, 1916. That the G.T.P.R. contribute \$2,500 toward the cost of constructing the interchange track, the remainder to be paid by the C.P.R.; and that the cost of maintenance be reserved for further consideration. That orders 24797 and 25400 be rescinded.

Transfer Track at Yorkton.

25424. Sept. 16. Re application of the Board of Trade of Yorkton for a transfer accommodation at Yorkton, between the Canadian Northern Ry. and the Grand Trunk Pacific Branch Lines Company. It is ordered that the Canadian Northern Ry. be directed to construct a transfer track at Yorkton between its railway and the Grand Trunk Pacific Branch Lines Co.'s railway, as shown on the plan dated Winnipeg, Aug. 29, 1916, and filed with the board. That the Canadian Northern pay four-fifths and the Grand Trunk Pacific Branch Lines Co. one-fifth of the cost of construction of the transfer track, the said companies to furnish without charge the necessary land on their respective rights of way for the transfer track. That the cost and maintenance of the transfer track be borne equally by the said railway companies. That the construction of the transfer track be completed.

Toronto, Hamilton & Buffalo Ry. Tariff.

25457. Sept. 22. Re application of Toronto, Hamilton & Buffalo Ry., under sec. 327 of the Railway Act, for the approval of its Standard Mileage Freight Tariff, C.R.C. no. 1113, cancelling C.R.C. no. 1, it is ordered that the said tariff be approved.

Coal Rates from Niagara Frontier to St. Catharines and Thorold.

25464. Sept. 25.—Re complaint of City of St. Catharines, Town of Thorold, McKinnon-Dash Co., Devaney & Son, D.

Dittrick, and W. H. McCormick, of St. Catharines; H. N. Boyle, of Merriton; Welland Vale Manufacturing Co., St. Catharines; Canadian Retail Coal Association of Brantford, and McMahon Bros. of Thorold, complaining against increase in rates on coal in carloads from Niagara Frontier to Thorold and St. Catharines for Niagara, St. Catharines & Toronto Ry. delivery. It is ordered that the railway companies interested establish with as little delay as possible, a joint rate of 47c a ton to apply on coal in carloads from the Niagara Frontier to Thorold and St. Catharines for Niagara, St. Catharines & Toronto Ry. delivery, to be apportioned between the two companies as follows—27c a ton to Michigan Central Rd. and 20c a ton to Niagara, St. Catharines & Toronto Ry.

The Assistant Chief Commissioner, D'Arcy Scott, gave the following judgment:—The Michigan Central Rd. and the Niagara, St. Catharines & Toronto Ry. have for many years had a joint rate in effect on coal from the Niagara Frontier to St. Catharines and other Niagara, St. Catharines and Toronto points of 40c a ton. Of this the Michigan Central received two-thirds and the Niagara, St. Catharines & Toronto one-third. This rate was cancelled on May 5 last, because the companies were unable to agree on the proportion each company should receive of the revenue. The Niagara, St. Catharines & Toronto contended that the extension of its line to Welland, which made Welland the interchange point, instead of Niagara Falls as formerly, materially reduced the Michigan Central's haul; and that therefore an equal division of the rate giving each company 20c should be made. The Niagara, St. Catharines & Toronto also contended that the payment of car rental for foreign cars on a per diem charge, instead of on a mileage basis, which was the method in use at the time the joint rate was established necessitated its securing an increased revenue or the traffic would be handled at a loss. This means that instead of paying 20c a car for mileage the car rental now amounts to \$2.70 a car; i.e., the per diem allowance of 45c for 6 days. This time is made up by counting 1 day in, 1 day passing customs, 3 days unloading allowed by the Car Service Rules, and 1 day out. The Michigan Central submitted that it was satisfied with the 40c rate so long as its proportion was two-thirds.

At the time the Niagara Central (now the Niagara, St. Catharines & Toronto) was built it received substantial financial aid from St. Catharines, and the company agreed that the rate on coal should not exceed 40c from the boundary for 20 years. The agreement was lived up to by the company, but the time limit expired some years ago. Coal merchants at St. Catharines and Thorold have spent money in the erection of coal sheds on the line of the Niagara, St. Catharines & Toronto with the expectation that the joint rate would be continued. The Grand Trunk had a 40c rate to these points which was unchanged; but, if these coal merchants desired to get their coal shipped in on the Grand Trunk they either had to pay cartage or interswitching to get it to their sheds.

After the cancellation of the 40c joint rate the Michigan Central put in a rate of 40c to Welland, and the Niagara, St. Catharines & Toronto put in a rate of 20c

from Welland to St. Catharines and Thorold, making the sum of the locals 60c in place of the 40c joint rate which had been cancelled.

Since the establishment of the 40c one line haul rate from the frontier to St. Catharines put in by the Grand Trunk, the Board in its judgment in the Eastern Rates Case has allowed a 10% increase. This rate is, therefore, now increased to 44c a ton.

A joint rate on coal from the frontier to St. Catharines and adjacent points over the Michigan Central and Niagara, St. Catharines & Toronto should be established; but it is not reasonable to expect that it should be as low as a one line rate. I think the Niagara, St. Catharines & Toronto has made out a good case for an increase. The Michigan Central said it was satisfied with its two-thirds of 40c which was (26.66c) 27c, and the Niagara, St. Catharines & Toronto stated it wanted 20c. Adding these together it would make a joint rate of 47c, which would be only 3c over the one line rate and would, I think, be reasonable.

An order should go for the establishment, as soon as possible, of a joint rate of 47c with the proportions to each company as stated. As far as this Board is concerned we will accept the new tariff effective on short notice, but the Interstate Commerce Commission requires 30 days notice of the new tariff to be given that commission and the public. Perhaps this time would be shortened if the Michigan Central applied for it.

Delivery of Milk and Cream at Parkdale.

25472. Sept. 27. Re application of G. R. Harris & Son, of Toronto, for an order requiring the C.P.R. to deliver shipments of milk and cream as before at Parkdale station and not West Toronto, which latter station is inconvenient to the applicant. Upon hearing the application at Toronto, July 10, in the presence of counsel for the applicants and the railway company, one of the applicants appearing in person, and upon the report of the Chief Operating Officer of the Board, it is ordered that the application be dismissed.

Omission of Symbols From Class Freight Rate Tariffs.

25555. Oct. 24.—Re tariffs of class freight rates authorized by general order 167, July 3, 1916, in what is known as the Eastern Rates Case, and the application of the C.P.R. for relief from the provisions of order no. 16900, June 27, prescribing certain symbols to denote rate changes. Upon its appearing that, owing to necessary changes in the groupings of the stations, it will be impracticable to carry out intelligibly the provisions of order 16900 with respect to the class freight tariffs from points west of Montreal to points east thereof, it is ordered that the said relief be granted, provided that a notice be printed at the beginning of the said tariff, or tariffs, reading as follows:—“This tariff contains the changes in rates authorized by the general order of the Board of Railway Commissioners for Canada, no. 167, dated July 3, 1916, which order has necessitated a rearrangement of the station groupings which makes it impracticable to indicate the individual changes by symbols as prescribed by the order 16900, dated June 27, 1912, the omission of the said symbols in this tariff having been authorized by order 25555, dated Oct. 24, 1915.”

Joint Rates, From Minnesota Transfer to Saskatoon.

Commissioner McLean gave the following judgment Sept. 28:—Various shipments were made at various dates in 1912 and 1913 from points east and south of Minnesota Transfer to Saskatoon, Sask. A claim for refund on account of alleged overcharges was made against the Canadian Northern Ry. by the Security Traffic Bureau of Minneapolis, acting for McKenzie & Thayer, of Saskatoon. Considerable correspondence has taken place between the applicant and the railway company. The matter has been submitted to the board for its opinion. From the points of origin in the U. S. there were no specific through rates to Saskatoon. The applicants built up a combination rate of 11c to Minnesota Transfer, plus 12c from Minnesota Transfer to International Boundary, plus 14c from International Boundary beyond, a total of 37 as against the rate of 38 charged. The rate of 14c from the International Boundary beyond is carried in C.N.R. Tariff C.R.C. 526, which, however, bears a notation "Rates shown herein may be used only when no other rates apply. They may not be used either by themselves or in combination in preference to any specific tariff rate."

The applicants contend that this clause does not apply in the present instance, as there are no specific through tariff rates from points of origin to destination, and that there is no other rate applying from the International Boundary to Saskatoon than that applying in the tariff above quoted, viz., 14c. The Canadian Northern in its correspondence points out that the rate of 27c charged from the Minnesota Transfer is a specific through rate. Minnesota Transfer is a recognized junction point, and it is also a basing point for rate making. A through rate was in fact in existence therefrom.

The Interstate Commerce Commission has ruled that where a through rate is constructed on a combination, each factor must be published and filed with the commission—Aubrey & Semple, v. G. H. & S. A. Ry. Co., 17 I. C. C., 271.

Under sec. 336 of the Railway Act, where traffic is carried from any point in a foreign country into Canada . . . by any continuous route, owned or operated by any two or more companies whether Canadian or foreign, a joint tariff for such continuous route shall be duly filed with the board. There is no plea that the route was discontinuous or that there was in fact a series of purely local movements. A joint tariff must, therefore, be filed and the filing covering the movement from Minnesota Transfer is a compliance with the Railway Act.

No information is submitted to show how the 27c rate is divided between the railway south of the International Boundary and the Canadian Northern. The jurisdiction of the board is in respect of the movement in Canada; there is no application to hold the 27c rate unreasonable because in excess of the locals and for corresponding reduction of the rate for the future. Without passing on the question of the jurisdiction of the board to regulate a through rate from Minnesota Transfer, a point in the U. S., to a point in Canada, it may be said that in general where a through rate is attacked as being unreasonable because in excess of the sum of the locals, the board's jurisdiction goes only as far as directing a reduction for the future. The board possesses no power to direct a refund. It

cannot, therefore, direct a refund of the difference, if any, between the division received by the Canadian Northern out of the 27c rate and the 14c local. The applicants' papers may be returned.

Railway Rolling Stock Notes.

The C.P.R. received 200 freight refrigerator cars from its Angus shops, Montreal, recently.

The Greater Winnipeg Water District which was in the market recently for a mogul locomotive, has purchased one from the City of Winnipeg.

The Eastern Car Co. expected to make the first shipment of 350 of the 2,000 box cars which it is building for the Paris & Orleans Ry., France, by the end of October.

The Timiskaming & Northern Ontario Ry. has received 2 Mikado locomotives, being part of an order for six, from the Canadian Locomotive Co. Details of these locomotives were given in a previous issue.

The C.P.R. has ordered 7 steel baggage cars, 70 ft. long; 74 steel underframe box cars, 40 tons capacity, and 22 steel underframe freight refrigerator cars, 41 ft. long, 30 tons capacity, from its Angus

shops. Between Sept. 18 and Oct. 18, received the following additions to rolling stock:—2 sleeping cars from National Steel Car Co., and 3 Pacific type locomotives from Montreal Locomotive Works.

Trucks C.P.R. standard 30 ton, diamond arch bar
Wheels M.C.B. standard 33 ins.
Brake shoes Dominion Brake Shoe Co.'s steel back

Following are chief details of 100 refrigerator cars, 40 tons capacity, with steel draft arms, which Canadian Car and Foundry Co. is building for Canadian Government Railways, as mentioned in our last issue:

Length 8 ft. 11 in.
Width over side sills 26 ft. 10 1/2 in.
Height, top of floor to underside of ceiling 28 ft. 9 1/2 ins.
Length inside between ice boxes 26 ft. 9 1/2 ins.
Width 7 ft. 6 3/4 ins.
Height top of floor to underside of ceiling 28 ft. 9 1/2 ins.
Outside of end sill to centre of body bolster 5 ft. 2 in.
Height, top of rail to centre of coupler 2 ft. 10 1/2 in.
Wheel base of truck 5 ft. 2 ins.
Centre to centre of trucks 26 ft. 9 1/2 ins.
Draft gear Tandem spring type
Couplers Improved M.C.B. automatic vertical plane type
Brake beam Westinghouse K.C. 1012
Trucks 40 ton standard, diamond arch bar
Wheels M.C.B. standard 33 ins.
Brake shoes Dominion Brake Shoe Co.'s steel back
Journal boxes McCord, M.C.B. 4 1/4 by 8 ins.
Journal bearing 5 lb. 9 in.
Ice tank 200 gal. capacity

Canadian Northern Railway Earnings, Etc.

July 1, 1916:

	\$7,519,100	\$5,249,700	\$2,269,400	\$1,325,300
Incr	\$3,573,800	\$2,248,500	\$1,325,300	...

Approximate earnings for Sept., \$3,187,900, and for three weeks ended Oct. 21, \$2,544,800, against \$2,757,000 for Sept., and \$2,407,110 for three weeks ended Oct. 21, 1915.

Canadian Pacific Railway Earnings, Etc.

1915-16, from July 1, 1915:

Grand Trunk Railway Earnings.

Approximate earnings for three weeks ended Oct. 21, \$2,810,229, against \$2,757,000 for Sept., 1915, and from July 1 to Sept. 30, \$1,076,505, against \$884,976 for same period.

Grand Trunk Pacific Railway Earnings.

Approximate earnings for three weeks ended Oct. 21, \$2,810,229, against \$2,757,000 for Sept., 1915, and from July 1 to Sept. 30, \$1,076,505, against \$884,976 for same period.

Railway Land Patent. The September letters patent were issued in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—
Calgary & Edmonton Ry. 2,511.00
Canadian Northern Ry. 338.36
Qu'Appelle, Long Lake & Saskatchewan Rd. & Steamboat Co. 2,555.00

Queen's University, Kingston, Ont. The following appointments have been made: J. F. Wilson of Michigan University, Professor of Electrical Engineering; L. S. Eaton of Cornell University, Professor of Mechanical Engineering; I. C. Demarest of Columbia University, Lecturer in Latin.

Canadian Northern Railway Construction, Betterments, Etc.

Montreal Tunnel and Terminal Co.—It is reported that tenders will be called for some time in November for the building of the station at Lagacheterie St., Montreal, as the first instalment of the Montreal terminal undertaking.

The Canadian Northern Ontario Ry. consists of a line from Montreal via Hawkesbury, where the C. N. Quebec Ry. connects with the old Great Northern Ry. route, to Ottawa and on via North Bay to Port Arthur, the Ottawa-Toronto line and the Sudbury line. At present the two latter lines run into the union station, Toronto, by an arrangement with the G.T.R. In order to obtain an entrance into the North Toronto station, for which an arrangement has been made with the C.P.R., a connection between these two lines and the tracks on which the C.N.R. has equal rights with the C.P.R., is about to be built.

The connecting link between the C.N.R. Toronto-Sudbury line and the Leaside-North Toronto will leave the Duncan station yard and run eastward to a connection with the C.P.R. near the east end of the West Don bridge. A spur of high land dividing the west and main branches of the Don (which is also crossed by the C.P.R. at Donlands station) necessitates a surmount in the grades, which will be 40 ft. per mile in each direction, and a somewhat heavy cutting, but these grades will be short and will be reduced by train filling when the traffic warrants the expense. The total length of the link will be 2.2 miles. Outside of the curves forming the junctions with existing lines at either end, there will be only one curve of three degrees, and with the exception of the cutting mentioned, which is the counterpart of that on the C.P.R., the work will be light. The C.P.R. double-track viaduct over the West Don will be used jointly by both roads, as also a joint double-track to North Toronto station. This double-track is completed to Leaside Jet. and the balance is under construction. The work on this 2.2 mile link is now in progress, Angus Sinclair being the contractor, and it is expected to be completed this season.

From the same point of junction on the C.P.R. a line has been located to a point on the company's Ottawa-Toronto line near Scarboro Village and has been approved by the Board of Railway Commissioners. This has a length of 4 miles; the grade standard will conform to that of the balance of the Ottawa-Toronto line—26 ft. to the mile, as also the curvature, which will have a maximum of four degrees. The work will be of ordinary character, with the exception of a viaduct over the Don River, which will be built at mileage 4.8 from Yonge St. It will be 650 ft. long, with a maximum height of 114 ft. The substructure will consist of 20 concrete pedestal piers and 2 abutments, in all approximately 950 cu. yds. The superstructure will consist of one 100-ft., five 70-ft. and five 40-ft. deck plate girder spans and five 40-ft. towers. It will be designed for class heavy loading, Dominion Government specification 1916, and the estimated weight will be about 620 tons.

The contract for this line and the substructure of the viaduct over the Don has also been let to Angus Sinclair, and is also expected to be completed this year. The location of both lines was made by H. K. Wicksteed, Chief Engineer of Surveys, Mackenzie, Mann & Co. Karl Hoff-

man is resident engineer for the C.N.R. on both pieces of line.

The object in view in the construction of both these lines is obvious. The C.N.R. has heretofore run all its trains into the union station, and except for the local freight yard in Cherry St. and the Rosedale station in the Don valley, has no terminal of its own in the lower part of the city. The Rosedale yard has now become quite inadequate to handle the growing business, and arrangements were made some years ago for a jointly-occupied station with the C.P.R. in North Toronto, and for extensive yards and shops at Leaside. It has now become essential that these be developed and used. Incidentally the long descent of 160 ft. to the lake level will be saved for the passenger traffic and the distance to all points north shortened five miles and to eastern points three miles. On account of the low speed permissible along the lake front the gain in time by the new route will average nearly half an hour. The distance from the union station to Rosedale is 3.8 miles and to Duncan is 11.1 miles. Tadmorden, where the two lines separate, the one to Parry Sound and the other to Ottawa being at mileage 5.06.

The Board of Railway Commissioners has authorized the altering of a bridge over the South Magnetawan River, mileage 34.85 from Parry Sound, Ont., also the building of a bridge across Current River, mileage 145.8 west from Jellicoe, and 2 miles east of Port Arthur, Ont.

Canadian Northern Ry.—The Board of Railway Commissioners has authorized the opening for traffic of the extension of the Winnipeg and Northern Ry. branch, mileage 48.56 to 62.78.

The Minister of Public Works for Manitoba informed a deputation from the Fort Alexander district recently that the Government will give every consideration to its request that the Province guarantee bonds of the C.N.R. for building an 18-mile line from Balsam Bay to Fort Alexander. Balsam Bay is 57 miles from Winnipeg, and is 4 miles on the Winnipeg side of the line now terminating at Grand Marais.

We are officially advised that the company expects to buy 35 miles of track west of Eston, Sask., this year.

We are officially advised that W. J. Cowan, Winnipeg, has been given a contract for grading on the Larch Lake branch, extending from Dumblane, Sask., for 35 miles in a southwesterly direction. Work on this line was started in August and is being pushed forward as fast as labor and other conditions permit.

Among the other works reported to have been completed during the year is the building of new stations on the Goose Lake line, the putting in of several new sidings, the erection of a three-stall locomotive house, with coal filling plant, a water tank, and the erection of a yardmaster's office at Drumheller, Alta. Drumheller is the junction of the line from Saskatoon with the Vegreville-Calgary line. Three steam shovels have been at work during the summer on bridge filling work west of Humboldt, and two on the Goose Lake line, taking out ballast for the line.

In connection with the building of the line from Hanna, mileage 263, on the Saskatoon-Calgary line, southeasterly to Medicine Hat, we are officially advised that construction was started in August

and that it is the intention to have the line completed this year. The Cowan Construction Co., Winnipeg, have the contract for 60 miles. A late press report states that about 23 miles have already been graded.

The Moose Jaw, Sask., City Council discussed, on Oct. 3, a plan for giving the C.N.R. connection with the civic spur line, and thus enabling it to transfer traffic with the C.P.R. A provisional agreement was reached, and the city also arranged to ask the Saskatchewan Government to give a provisional guarantee of bonds for an independent C.N.R. terminal in the city in lieu of the present guarantee for a joint terminal with the Grand Trunk Pacific.

A press report from Edmonton states that the Alberta Government has been advised that 100 miles have been graded on the Oliver-St. Paul de Metis line, the grade now reaching to within 25 miles of St. Paul, the objective point, and that it is expected to lay track on the 100 miles this year.

Plans have been deposited with the Public Works Department, Ottawa, showing location, etc., of a bridge across the Sturgeon River on lot 23, tp. 56, range 23, west of 4th meridian.

The spur track from Brule, mileage 23.45, on the transcontinental line to the Brule Lake coal field was reported to be practically completed Oct. 11. The collieries being opened are controlled by a company in which F. H. Phippen, General Counsel for the C.N.R., and Joseph Errington, of the company's resources department, are interested, and of which P. C. Andrews is General Manager.

Canadian Northern Pacific Ry.—We are officially advised recently that no contract had been let for the construction of the Kamloops-Okanagan branch.

While M. H. MacLeod, General Manager and Chief Engineer, was at the Pacific Coast recently, he inspected the practically completed car shops, the new car ferry dock and other terminal facilities at Port Mann, and discussed matters connected with the work in progress at the False Creek terminals, Vancouver, with the city council. He is reported to have said that a considerable amount of additional work would be started forthwith. One of these works is the building of the freight sheds, for the erection of which a contract is reported to have been let to Macdonald, Nettleton & Bruce, Vancouver, at an estimated cost of \$125,000.

The new freight offices and shed at Vancouver will be erected at False Creek to the south of and in close proximity to the company's new passenger station. The freight offices will occupy a 2 story block, having a frontage of 100 ft., and a depth of about 55 ft., giving ample accommodation for the various departments. The building is designed along simple, but attractive, lines, and will have its exterior walls constructed generally with brick with stone dressings and features. The floors, except basement, will be constructed of timber finished with maple. The basement floor will be cement finished on concrete slab. Lavatory accommodation will be provided for both men and women on each floor, and ample light and ventilation will be available in all parts of the building. The roof will be of flat type. The building will be supported by pile foundation.

The freight shed, which will be built immediately east of the freight office block, will be 40 x 800 ft., supported on pile foundations. The roof will be supported on steel columns and will be constructed of steel trusses carrying wood purlins and covered with 2 in. plank, finished with tar and gravel roofing. The floors will be of heavy timber construction, finished with 2 in. rough and $\frac{7}{8}$ in. finished flooring. The walls to level of door heads will be constructed of studing with $\frac{7}{8}$ in. sheeting outside and inside. The outside surface will be finished with galvanized corrugated iron. Along the entire length of the building above door heads will be a continuous glazed transom light. On the track side of shed doors will be continuous, and on teaming side doors will occur only in alternate 16 ft. bays. The shed will be divided into four compartments by the introduction of three 13 in. fireproof walls at equal intervals along the length of shed; provision will also be made at extreme east end of shed for cold storage, and at the west end (that is the end nearest the freight office block) rooms will be provided for the shed foreman, porters and for staff lavatory. About midway up the shed will be located the customs office. Electric light will be used in both freight offices and shed.

Along the track side of shed will be run three lines of tracks and beyond the farthest out of these will be a distributing platform 13 ft. wide, which will be continued along the entire length of the shed.

The buildings have been designed by the company's architects, Pratt & Ross, of Winnipeg and Vancouver, and the cost, exclusive of tracks and teamways, will probably run to about \$150,000.

Railway Finance, Meetings, Etc.

Boston & Maine Rd.—A U. S. Court at Boston, Mass., Oct. 16, authorized certain minority shareholders to intervene in the receivership proceedings now pending, and fixed Oct. 30, as the date of hearing arguments.

A United States court in New York, on Oct. 20, extended to Jan. 1, 1918, the date fixed for the sale of the New York, New Haven & Hartford Rd.'s holdings in the B. & M. Rd.

The Canadian Northern Ry. has given notice that the net earnings for the half year ended June 30 were insufficient to enable the interest to be paid on the 5% income charge convertible debenture stock on Nov. 2.

Ottawa Terminals Ry.—The board of directors elected at the recent annual meeting, for the current year, is:—E. J. Chamberlin, President; H. G. Kelley, Vice President; Frank Scott, Secretary and Treasurer; J. E. Dalrymple, R. S. Logan, H. R. Safford and W. H. Biggar, K.C.

Toronto, Hamilton & Buffalo Ry.—A recent press report stated that the company was issuing \$10,000,000 4½% consolidated bonds due in 1966 to retire a maturity bond issue and to provide some \$5,000,000 for betterments. We are officially advised that the report is incorrect. Under the Dominion Parliament's authority, a mortgage has been made to secure an issue of \$10,000,000 of consolidated mortgage, bonds and \$2,000,000 par value of them have been sold to the Canadian Pacific, the Canada Southern, New York Central and Michigan Central Companies.

Filing of Freight Tariffs on Less than Statutory Notice.

Commissioner McLean, of the Board of Railway Commissioners, gave the following judgment recently:—

"Under date of May 26, 1916, complaint was received from T. M. Stevens & Co., Vancouver, B.C., stating that they had been advised by one of the railway companies that an advance was to be made in the rates on sago and tapioca from 80c to 90c per 100 lb., and on spices from 80c to \$1 per 100 lb. It was stated that prior to the beginning of the war there had been a through rate of \$1.30 per 100 lb. on these commodities, and it was stated that the division of this rate to the railways would not exceed 70 to 75c per 100 lb. It was stated, further, that after trans-Pacific freights advanced, the railway companies put in a rate of 80c, which was quite satisfactory to the applicants, and that the applicants had developed a considerable business on these rates. It was urged by the applicants that the railway companies be enjoined from making an advance pending a general hearing and justification of the rates in question.

"As will be noted, the rates in question are import rates from Vancouver to points in Eastern Canada.

"In answer to the complaint as launched the Great Northern Ry. replied as follows: 'The rates as specifically named in complainants' letter on sago and tapioca from 80c to 90c carloads is correct. Proposed advances as stated are to become effective Aug. 1. These rates are proportional rates applying on traffic which originates in the Orient. The conditions under which the present rates were established do not exist today. At the time rates were originally established a great deal of the Oriental tonnage moved into Atlantic ports via direct steamship lines and the present rates from Vancouver and Puget Sound ports were established in order to enable the rail carriers from such ports to obtain a share of this Oriental traffic, in connection with the steamship lines, operating from the Orient to Vancouver and Puget Sound ports. The company considers the proposed advances to be fair and consistent, since the former conditions do not now exist, as to the direct movement of Oriental traffic to United States and Eastern Canadian ports as today. There is a scarcity of bottoms that in the past have been handling Oriental traffic direct to Atlantic ports and the company thinks, therefore, that carriers are warranted in making the slight advances that they have. The company also says that there has been a general advance made covering all commodities, and in a great number of cases the shippers as well as consignees were interviewed as to the possibility of permitting the carriers to make these advances. The condensed result has been that the shippers as a whole saw no objections to these slight advances; for instance, the carriers advanced the import rate on tea, carloads, from \$1 to \$1.10. Before this advance was concurred in by interested lines, the tea trade was canvassed, with results that most of the shippers and consignees of tea informed the carriers that rate points could be advanced from 10 to 25%. In view of these statements from the tea shippers as well as similar statements from other shippers on other commodities, the company considers the advances

made on sago, tapioca, and spices to be entirely proper and in keeping with the manner in which the present rates were established.

"The company respectfully submits that the advanced rates ought to be maintained."

"Subsequently a tariff showing the increased rates complained of was filed. Other increases are also set out in this tariff. The matter of justifiability of the rate increase or increases is not gone into here, as the immediate question involved is entirely one of the legality of the filing. The tariff in question is East-bound Import Tariff 2C-D cancelling a similarly described tariff 26-C. This tariff quotes import class rates and commodity rates from specified points on the Pacific Coast of the United States and from Prince Rupert, Vancouver and Victoria, B.C., to points in United States and Canada as set out in the tariff. While the tariff is issued by R. H. Countiss, agent for the railways, and deals with the rates both on United States and Canadian movements, what is especially concerned here is the question of the requirements of the Railway Act in regard to filing.

"The tariff which is numbered C.R.C. No. 364 has also an I.C.C. No. 1026. On the face of the tariff is the notation that it is issued under the authority of Rule 71, Interstate Commerce Commission Circular 18-A. Under this ruling, which is concerned with export and import tariffs, it is set out that, 'in consideration of unusual and special circumstances surrounding the movement of traffic exported to or imported from foreign countries not adjacent to the United States and which moves through ports of the United States or Canada on the Pacific Ocean as to said traffic and confined to tariffs which contain only rates applicable thereto, the commission, by its order of Oct. 24, 1908, authorizes carriers to make changes in said rates upon notice to the commission and to the public in manner prescribed by law of three days as to changes which affect reductions in rates or charges, and like notice of 10 days as to changes which affect increases in rates or charges.'

"The tariff as filed bears on its face the statement that it is issued July 7, 1916, effective Aug. 1, 1916. As a matter of fact, the filing date with the Board was later, it not being until July 13 that the tariff in question was received. Under sec. 328 of the Railway Act, as amended by 1 & 2 Geo. V, chap. 22, sec. 11, it is provided that when a special freight tariff advances any toll previously authorized to be charged under the Railway Act, the company is to file and publish such tariff 30 days previous to the date the tariff is intended to take effect. In view of the fact that the tariff was issued as of July 7, 1916, effective Aug. 1, 1916, and the further fact that it was not filed with the board until July 13, the non-compliance with the provisions of the Railway Act was taken up with the railway companies. The answer of the Great Northern is submitted by its Solicitor, Mr. Haydon, said answer being sent out in the letter of the General Solicitor of the Company. It states, inter alia, that the 'Interstate Commerce Commission usually allows rates on import traffic to be put into effect on short no-

Canadian Railway MarineWorld

ESTABLISHED 1898

Marine, Express, Telegraph, and Railway and Canal
Contractors' Interests.

Official Organ of various Canadian Transportation
Associations.

Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C.E.
Managing Director and Editor-in Chief.

AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editors

W. H. HEWITT, 70 Bond Street, Toronto

Canadian Business Representative.

United States Business Representative,
A. FENTON WALKER, 143 Liberty St., New York

European Business Representative,
J. MEREDITH McKIM, 16 Regent St., London, Eng.

Authorized by the Postmaster General for Canada,
for transmission as second class matter.

Entered as second class matter, July 25, 1913, at the
Postoffice at Buffalo, N.Y., under the Act of Congress
of March 3, 1879.

SUBSCRIPTION PRICE, including postage any-

SINGLE COPIES, 20 cents each, including postage.

The test and safest way to remit is by express money
order. Where one cannot be obtained, a post office
money order, or bank draft, payable at par in Toronto,
may be sent. Cheques or drafts not payable at par in
Toronto cannot be accepted. Remittances should be
made payable to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.
ADVERTISING COPY must reach the publishers by
the 10th of the month preceding the date of publication.

TORONTO, CANADA, NOVEMBER, 1916.

PRINCIPAL CONTENTS.

Appointments, Transportation	455
Orders by, Summaries of	440
Canadian Government Railways, Pacific Type	
Canadian Northern Ry. Construction, Etc... ..	452
Division: Changed	454
Expenditures on Additions, Etc.	439
Duluth, Winnipeg & Pacific Ry. Box Cars.. ..	438
Electric Railway Department	457 to 463
Electric Railway Topics	459
Financial Bearings, Etc.	462
Lake Erie & Northern Ry. Electrification	457
.....	
.....	460
& Amherstburg Ry.	
Wage Arbitration	461
Three River, Traction Co. Equipment, Etc.	462
Toronto & York Radial Ry. Deviation	461
Toronto & Vaughan Ry. Extensions	463
Express Companies, Among the	463
Freight and Passenger Traffic Notes	446
Grain in Some Terminal Elevators	443
Hard Rails on Locomotives and Tenders	435
Mainly About Railway People	448
Marine Department	464 to 472
Imperial Oil Co.'s Tank Steamships	466
Montreal Transportation Co.'s New Steam-	
.....	469
Sault Ste. Marie Canals Traffic	
.....	472
Co.	
National Transportation Ry. Elevator at	
Nigerian Railway Bogie Cars	438
Pacific Great Eastern Ry. Annual Meeting.. ..	456
Railway Commission of Enquiry	444
Railway Earnings	451
Railway Finance, Meetings, Etc.	453
Railway Location and Construction Through	
Muskeg Swamps	433
Railway Mechanical Methods and Devices	436, 437
Telegraph, Telephone and Cable Matters....	455

tice; that under the circumstances the Canadian Commission should do likewise.

"The board is advised by the C.P.R. as follows:—

"In this matter, through an oversight, R. H. Countiss, who issued Transcontinental Tariff D-26, neglected to file it with the board the full 30 days in advance of its effective date as required by sec. 328 of the Railway Act. Accordingly, I have to request that the board consent to alter the effective date of the tariff to Aug. 8, and arrangements will be made to refund, on application, the excess charges on any shipments which moved between Aug. 1 and Aug. 8, when it should properly have been effective."

As to the position taken by the General Solicitor of the Great Northern that the board should grant short notice on import traffic, that is manifestly a question of what power is given under the Railway Act. The board is bound by the ex-

PLICIT provisions of the Railway Act. As to the suggestion contained in the latter paragraph of the letter of the Canadian Pacific as above quoted, the initial filing not having been in compliance with the provisions of the Railway Act, there is no power in the board to alter the effective date of the tariff to Aug. 8. The full 30 days notice is required in connection with filing with the Board. At best, however, there was only a period from July 13 to Aug. 1 covered by notice, and this does not establish a credit of so many days in connection with a later and amended notice of filing. The tariff as filed has not met the requirements of the Railway Act, and the railway companies cannot legally collect rates thereunder in respect of movements within the scope of the Railway Act. If the railway companies desire to put the tariff in question into force, immediate steps should be taken to file in accordance with the terms of the Railway Act.

Changes in Names of C.P.R. Divisions, Districts and Subdivisions.

Commencing with the going into effect of the autumn time tables the 8 grand divisions on the C.P.R. have been changed to districts, their names being also changed in certain cases, and the districts have been changed to divisions, the territorial limit of each remaining as heretofore. The alterations in names are as follows:

Atlantic Division changed to New Brunswick District; District 1 changed to Brownville Division; District 2 changed to Woodstock Division.

Eastern Division changed to Quebec District; District 1 changed to Farnham Division; District 2 changed to Montreal Terminal Division; District 3 changed to Laurentian Division; District 4 changed to Ottawa Division; District 5 changed to Smiths Falls Division.

Ontario Division changed to Ontario District; District 1 changed to Trenton Division; District 2 changed to London Division; District 3 changed to Bruce Division; District 4 changed to Toronto Terminal Division.

Lake Superior Division changed to Algoma District; District 1 changed to Sudbury Division; District 2 changed to Chapleau Division; District 3 changed to Schreiber Division.

Manitoba Division changed to Manitoba District. Fort William Terminals changed to Fort William Terminal Division. District 1 changed to Kenora Division; Winnipeg Terminals changed to Winnipeg Terminals Division; District 2 changed to Portage Division; District 3 changed to Brandon Division; District 4 changed to Souris Division.

Saskatchewan Division changed to Saskatchewan District; District 1 changed to Regina Division; District 2 changed to Moose Jaw Division; District 3 changed to Saskatoon Division.

Alberta Division changed to Alberta District; District 1 changed to Medicine Hat Division; District 2 changed to Lethbridge Division; District 3 changed to Calgary Division; District 4 changed to Edmonton Division.

British Columbia Division changed to British Columbia District; District 1 changed to Revelstoke Division; District 2 changed to Vancouver Division; District 3 changed to Nelson Division; District 4 changed to Cranbrook Division.

In order to avoid any subdivision bearing in some cases the same name as a division, the following changes in names of subdivisions have been made:

New Brunswick District—Brownville Subdivision changed to Mattawankeag Subdivision; Woodstock Subdivision changed to Shogomoc Subdivision.

Quebec District—Trenton Subdivision changed to Adirondack Subdivision; Quebec Subdivision changed to Trois Rivières Subdivision; Ottawa Subdivision changed to Lachute Subdivision; Smiths Falls Subdivision changed to Winchester Subdivision; Laurentian Subdivision changed to St. Agathe Subdivision.

Ontario District—Toronto Subdivision changed to Oshawa Subdivision; London Subdivision changed to Galt Subdivision; Trenton Subdivision changed to Belleville Subdivision.

Algoma District—Sudbury Subdivision changed to Parry Sound Subdivision; Chapleau Subdivision changed to Nemegos Subdivision; Schreiber Subdivision changed to Heron Bay Subdivision; Algoma Subdivision changed to Thessalon Subdivision.

Manitoba District—Fort William Subdivision changed to Kaministiquia Subdivision; Kenora Subdivision changed to Keewatin Subdivision; Souris Subdivision changed to Glenboro Subdivision; Brandon Subdivision changed to Carberry Subdivision.

Saskatchewan District—Regina Subdivision changed to Kisbey Subdivision; Moose Jaw Subdivision changed to Indian Head Subdivision; Saskatoon Subdivision changed to Sutherland Subdivision.

Alberta District—Medicine Hat Subdivision changed to Maple Creek Subdivision; Calgary Subdivision changed to Brooks Subdivision; Lethbridge Subdivision changed to Taber Subdivision; Edmonton Subdivision changed to Ledue Subdivision.

British Columbia District—Cranbrook Subdivision changed to Fernie Subdivision.

The American Association of Traveling Passenger Agents held its 44th annual convention at Philadelphia, Pa., Oct. 2 and 3, when there was an attendance of over 400 delegates.

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost exclusively from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who has notice any error in our announcements will confer a favor by advising us.

Canadian Government Railways.—F. W. ROBERTSON, District Passenger Agent, Halifax, N.S., has also been appointed acting Superintendent, Sleeping and Dining Car Service, vice L. B. Archibald, who has been granted temporary leave of absence owing to ill health.

W. A. DUFF, Engineer of Bridges, has been appointed Assistant Chief Engineer. He continues to perform the duties of Engineer of Bridges, and has charge of the Halifax Ocean Terminals, and will perform such other work as may be assigned to him by the Chief Engineer. Office, Moncton, N.B.

A. C. BARKER has been appointed acting Superintendent of Telegraph and Time Service, Intercolonial Division. Office, Moncton, N.B.

S. ALLANACH, heretofore Roadmaster, Fredericton Subdivision, Intercolonial Division, Fredericton, N.B., has been appointed Roadmaster, Campbellton Subdivision, Intercolonial Division, vice A. B. Gorham, transferred. Office, Campbellton, N.B.

A. B. GORHAM, heretofore Roadmaster, Campbellton Subdivision, Intercolonial Division, Campbellton, N.B., has been appointed Roadmaster, Leonard Subdivision, Intercolonial Division, vice J. Bury, transferred to Transcontinental Division. Office, Campbellton, N.B.

J. RUPP, heretofore Roadmaster, Leonard Subdivision, Intercolonial Division, Campbellton, N.B., has been appointed Roadmaster between Napadogan and Edmundston, Transcontinental Division. Office, Edmundston, N.B.

H. A. IRVING, heretofore chief clerk to Superintendent, Fort William, Ont., has been appointed acting Trainmaster, District 3, Transcontinental Division, Graham, Ont.

J. W. CAMPBELL, heretofore section foreman, Sunstrum, Ont., has been appointed acting Roadmaster, Graham, Ont., vice P. B. Bernard, resigned.

H. G. REID, heretofore Master Mechanic, District 3, Transcontinental Division, Transcona, Man., has been appointed Assistant Superintendent of Rolling Stock, reporting to Superintendent of Rolling Stock, Moncton, N.B., and has direct charge of the Transcona shops and will perform such other duties as may be assigned to him. Office, Transcona, Man.

JOHN BIRSE, heretofore Road Foreman of Locomotives, Graham, Ont., has been appointed District Master Mechanic, District 3, Transcontinental Division, and his former position has been abolished. Office, Transcona, Man. The position of Master Mechanic, District 3, heretofore held by H. G. Reid, who has been appointed Assistant Superintendent of Rolling Stock, has been abolished.

Canadian Northern Ry.—H. J. LECLAIRE, heretofore Soliciting Passenger Agent, Toronto, has been appointed Travelling Passenger Agent, Montreal, vice C. A. Langevin.

F. C. TURNER has been appointed Travelling Passenger Agent, Montreal.

J. B. SMITH has been appointed Rule Instructor, Lines East of Port Arthur. Headquarters, Toronto.

J. E. BERRY, heretofore Yardmaster, Regina, Sask., has been appointed Gen-

eral Yardmaster, Saskatoon, Sask.

J. L. LOUNSBERRY has been appointed Travelling Agent. Headquarters, 510 Woolworth Bldg., New York, N.Y.

H. S. HEAD has been appointed Travelling Agent. Headquarters, 510 Woolworth Bldg., New York, N.Y.

A. DeWITT FOSTER has been appointed Travelling Immigration Agent. Headquarters, 64 West Adams St., Chicago, Ill.

Canadian Pacific Ry.—E. W. BEATTY K.C., Vice President and General Counsel, has been added to the Executive Committee, the number of directors on which has been increased from 5 to 6.

DR. H. A. BEATTY, heretofore Chief Surgeon and Medical Officer, Eastern Lines, has been appointed Chief Surgeon and Medical Officer for the system. Office, Toronto.

N. S. DUNLOP, Insurance and Tax Commissioner, having resigned on account of ill health, the position has been abolished. All matters pertaining to assessments, taxes, local improvements, etc., affecting the company's property on Eastern Lines, will be handled by FRANK TAYLOR, Right of Way and Tax Agent, Montreal. As the company is setting up its own insurance fund, all insurance matters will be handled by E. MOORE, of the Financial and Accounting Vice

ern Lines, s, etc., in connection west of Fort William, used in connection

ALLAN PURVIS, General Superintendent, Quebec District, Montreal, has been appointed General Superintendent,

J. H. BOYLE, Superintendent, Farnham Division, Quebec District, Farnham, will act as General Superintendent, Quebec District, Montreal, during Mr. Purvis' absence in Toronto.

W. J. UREN, Superintendent, Trenton Division, Ontario District, who has been acting as General Superintendent, Ontario District, since Mr. Arnold became

L. G. ROGERS, Assistant Superintendent, Trenton Division, Ontario District, Trenton, who has been acting as Superintendent of that district while W. J. Uren has been acting as General Superintendent, Ontario District, has returned

H. H. TRIPP, heretofore Resident En-

H. J. BLACK, heretofore Resident Engineer, Kenora, Ont., has been appointed

E. H. GODWIN has been appointed Alta., vice E. Cotty, who was Manager of the service.

W. E. CLINE, heretofore Chief Dispatcher, Winnipeg, has been appointed Trainmaster, Macleod, Alta., vice W. M. Ansley, whose appointment as Trainmaster, Assiniboia, Sask., was announced in our last issue.

M. G. MURPHY, heretofore District Passenger Agent, St. John, N.B., has been appointed General Agent, Passenger Department, C.P.R. and Canadian Pacific Ocean Services, Ltd., Detroit, Mich., and not merely for the C.P.R., as mentioned in our last issue.

G. G. McKAY, heretofore City Passenger Agent, Detroit, Mich., has been appointed Travelling Passenger Agent for the lower peninsula of Michigan, vice E. C. Oviatt, transferred to other duties in Michigan. Office, Detroit.

A. E. EDMONDS, heretofore General Agent, Passenger Department, Detroit, Mich., has been appointed City Passenger Agent there, vice G. G. McKay, transferred. He deals with all requests for sleeping car reservations.

W. C. ELMER has been appointed City Ticket Agent, Detroit, Mich.

Superintendent, Sleeping, Dining and Parlor Cars and News Service, Eastern Lines, C.P.R., Montreal, has been appointed Purchasing Agent, Canadian Pacific Ocean Services, Ltd., Vancouver, B.C.

T. J. BURNS, heretofore Passenger China, has been appointed, vice J.

ghai, Chicago, St. Paul, Minneapolis &

Main St. E. R. CUNNINGHAM, heretofore Travelling Agent, C. St. P. M. & O. R.

Grand Trunk Ry.—W. H. SAMPLE, heretofore Master Mechanic, Western Lines, Battle Creek, Mich., has been appointed Master Mechanic, Eastern Lines.

borough, Ont., vice B. A. Rose, resigned.

B. J. FARR, heretofore Locomotive appointed Master Mechanic, Western Lines, vice W. H. Sample, transferred.

appointed:—Niagara Falls, Ont., W. Kew; Goldstone, Ont., C. S. Groh; Belgrave, Ont., R. Yule.

Grand Trunk Pacific Ry.—W. A. B. RUSSELL has been appointed Commercial Agent, Regina, Sask., vice A. E. McMaster, promoted.

A. E. McMASTER, heretofore Commer-

pointed Division Freight Agent, Edmonton, Alta., vice W. J. P. McGregor, granted leave of absence.

W. E. SIMMONS, heretofore Chief Dispatcher, Tofield, Alta., has been appointed Chief Dispatcher, Biggar, Sask., and the dispatching office at Tofield has been closed in a readjustment of territory.

JAMES PORTEOUS, heretofore Car Inspector, Smithers, B.C., has been appointed Car Foreman there, vice F. E. Dymond, transferred.

F. E. DYMOND, heretofore Car Foreman, Smithers, B.C., has been appointed Car Foreman, Prince Rupert, B.C., vice C. A. McNiece, resigned.

The following station agents have been appointed:—Spy Hill, Sask., E. P. Guay; Waldron, Sask., J. M. Carson; Unity, Sask., M. L. Myers; Lebret, Sask., H. L. Cole; Griffin, Sask., F. C. Scheppele; Northgate, Sask., J. R. Wilson; Lawson, Sask., D. L. Cozeart; Riverhurst, Sask., B. Clee; Ryley, Alta., A. E. Bodieu; Swallow, Alta., J. E. Rivard.

Intercolonial Ry.—See Government Railways.

Michigan Central Rd.—J. R. CAMPBELL, heretofore Assistant Yardmaster, Montrose, Ont., has been appointed General Yardmaster, Windsor, Ont., vice F. McElroy, whose appointment as Trainmaster, St. Thomas, Ont., was announced in our last issue.

National Transcontinental Ry.—See Canadian Government Railways.

New York Central Rd.—A. T. HARDIN, Vice President in charge of operation, has been appointed Assistant to the President, regardless of department, and in connection with lines not directly operated. He continues as Vice President, N.Y.C.R., and has also been appointed Vice President, Ottawa & New York Ry., Michigan Central Rd., and Cleveland, Cincinnati, Chicago and St. Louis Rd. Office, New York.

P. E. CROWLEY, heretofore Assistant Vice President, Operating Department, has been appointed Vice President, Operating Department, N.Y.C.R. and Ottawa & New York Ry., vice A. T. Hardin, promoted. Office, New York.

Ottawa & New York Ry.—See New York Central Rd.

Pere Marquette Rd.—JOHN HANDFORD, heretofore valve setter, has been appointed General Foreman, St. Thomas, Ont., vice G. W. Cook, resigned.

St. John Ambulance Brigade.—The annual inspection of the three nursing divisions of the St. John Ambulance Brigade—C.P.R., Fort Garry and Fort Rouge—took place at Winnipeg, Oct. 11. The C.P.R. division is composed of wives and daughters of C.P.R. men, and is actively engaged in sending supplies to the Red Cross Society, in addition to doing first aid and other work locally.

Quebec Railway, Light & Power Co.'s Traffic. During the year ended June 30, 1916, the total number of passengers carried on the City Division, including transfers, was 15,227,583. On the Montmorency Division the total number of passengers carried was 1,890,207, and 9,253 car loads of freight were hauled. fiscal year.

The C.P.R. Opened, on Oct. 12, in the Shaughnessy Building, Montreal, an exhibition of toys and novelties made in New England States by fishermen and others during the winter nights. The C.P.R. has made this collection with a view of demonstrating the possibilities of a Canadian toy industry.

Pacific Great Eastern Railway's Annual Meeting.

At the annual meeting in Victoria, B.C., recently, the following report was presented for the year ended June 30, over the signature of J. W. Stewart, President:—

In many respects, considering only the progress of construction, the year in review has been an unfavorable one to the company's objects. Under the pall of the greatest war in the history of man, it has been impossible, during this time, to accomplish more than a small percentage of the work remaining to be done at the close of the last fiscal year. Early in the spring of 1912, the company entered into an agreement with the British Columbia Government, calling for the completion of the line from Vancouver to Fort George (now Prince George) by July 1, 1915. This agreement was, of course, made in good faith between the company and the government, the company confident of its ability to do its part and the government expecting nothing less. From causes with which you are familiar the requisite progress was not made and it was seen that more time would be required to complete the undertaking, and, being apprised of the facts, the government, in the spring of 1914, increased the amount of its assistance to the enterprise.

It might be well here briefly to recapitulate the financial assistance rendered by the government. In 1912, the government guaranteed securities of the company to the extent of \$35,000 a mile for 450 miles of line; in 1914, this guarantee was extended over the entire mileage of 480 miles, and additional securities to the extent of \$7,000 a mile were guaranteed, making a total of \$42,000 a mile for 480 miles, amounting to \$20,160,000. Of these securities, \$14,234,805 were sold and the balance \$5,925,195 pledged to secure a loan of \$4,800,000, prior to the date of our last annual meeting.

During the spring of this year your directors unreservedly presented the status of the undertaking to the government, which brought down before the Legislative Assembly an important measure of relief which was enacted into law, authorizing the Provincial Minister of Finance to advance by way of loan to the company \$6,000,000 at the actual cost to the government of obtaining same, and repayable at or before the expiration of 10 years. The funds thus provided will, in the opinion of your Chief Engineer, enable the completion of that portion of the line between Squamish, at the head of navigation, Howe Sound, and Prince George, where connection will be made with the Grand Trunk Pacific transcontinental line.

The summons of patriotism to service overseas has been so faithfully obeyed by the youth and the eligible older men of this province that it is now impossible adequately to man the work, and the difficulty experienced in obtaining track and bridge material, occasioned by the unprecedented demands of the war and industry upon the metal markets, is another militating factor in determining the time required to complete your line of railway. Secure in the knowledge that the results so far attained are in the highest degree satisfactory, and confident that the best efforts possible were made to carry on the work as originally contemplated, you may rest assured that no effort will be spared in the future that will

promote the cause of the undertaking. As, upon the close of the year gone by, in the fortunes of our beloved Canada and the Motherland and our gallant allies an era of higher hopes has dawned and notable success already attained, earnest of greater achievement, so we may hope in the ensuing months for the dawning of brighter days upon our own undertaking. The settler is beseeching us to hasten the completion of the railway to enable him to get in to the land; the forests and mines are crying out to us to move their abundant products to market; and the teeming plains of the northland are groaning for deliverance. Abundant traffic is in prospect waiting upon the completion of the line whose need becomes daily more urgent. It therefore behooves us to continue our earnest efforts to that end.

The directors for the current year are: J. W. Stewart, President; D'Arcy Tate, K.C., Vice President and General Counsel; T. Foley, Vice President; F. Wilson, Land Commissioner, and E. F. White. The other officers are: R. D. Thomas, Secretary-Treasurer; Jno. Callaghan, Chief Engineer; A. H. Sperry, Land Commissioner.

Telegraph, Telephone and Cable Matters.

A. Malcolm has been appointed chief operator, C.P.R. Telegraphs, Montreal, vice J. G. Davies, who resigned recently to enter Great North Western Telegraph Co.'s service at Winnipeg, as announced in our last issue.

G. H. Walters is acting as a special representative of the Great North Western Telegraph Co.'s traffic department at Winnipeg, pending the appointment of a chief operator in the place of B. S. Round who has resigned.

M. S. J. Baker was acting Superintendent of Telegraphs, Saskatchewan Division, C.P.R., and H. B. McIntyre was acting in a similar capacity, British Columbia Division, C.P.R., during the absence of D. Coons and R. N. Young, respectively, on vacation.

J. G. Davies, heretofore chief operator and circuit manager, C.P.R. Telegraphs, Montreal, has been appointed Superintendent, District 4, and Manager Winnipeg office, Great North Western Telegraph Co., J. Padington, Superintendent, and S. Goldstein, Local Manager, having resigned. Biographical details were given in our last issue.

At the Great North Western Telegraph Co.'s annual meeting at Toronto, Oct. 2, the following board was elected for the current year:—Z. A. Lash, K.C., President; Adam Brown, Vice President; G. D. Perry, General Manager; Jas. Hedley, —Hon. J. K. Kerr, K.C., Aemilius Jarvis, F. B. Hayes, D. B. Hanna and R. P. Ormsby. A. C. McConnell is Secretary and Auditor, and D. E. Henry is Treasurer.

Government Railways Rules.—An order-in-Council has been passed rescinding portions of the general train an interlocking rules for use on the Canadian Government Railways approved Jan. 22, 1914, and substituting new sections therefor. The amended sections cover definitions and indications under the headings "Automatic block signals," and "Interlocking signals."

The Acadia Coal Co. has received 150 all steel mining cars from Canadian Car and Foundry Co.

Electric Railway Department

Electrification of Lake Erie and Northern Railway.

The L.E. and N.R., which is a C.P.R. subsidiary, is a single track, standard gauge line, with Galt, Ont., as its northern terminus, and Port Dover, Ont., as its southern terminus. It runs through the towns of Paris, Brantford, Waterford, and Simcoe, to Port Dover, on Lake Erie. It is expected that a coal ferry service will be put in operation from Port Dover

stations and an extra portable station for use where necessary. This portable substation was fully described in our June issue. Had 600 volts been decided upon, 6 substations would have been required, together with a large amount of overhead feeder, etc.

The traffic conditions require, for conductivity, the equipment of two 0000 B. &

which is 75,000 c.m., corresponding in conductivity to two 0000 copper wires. The sag of this messenger in the standard 150 ft. span is 2 ft. at 60° Fahrenheit. At intervals of a mile the messenger and the trolley wires are anchored in both directions, galvanized iron clamps and guy cables being utilized for this purpose.

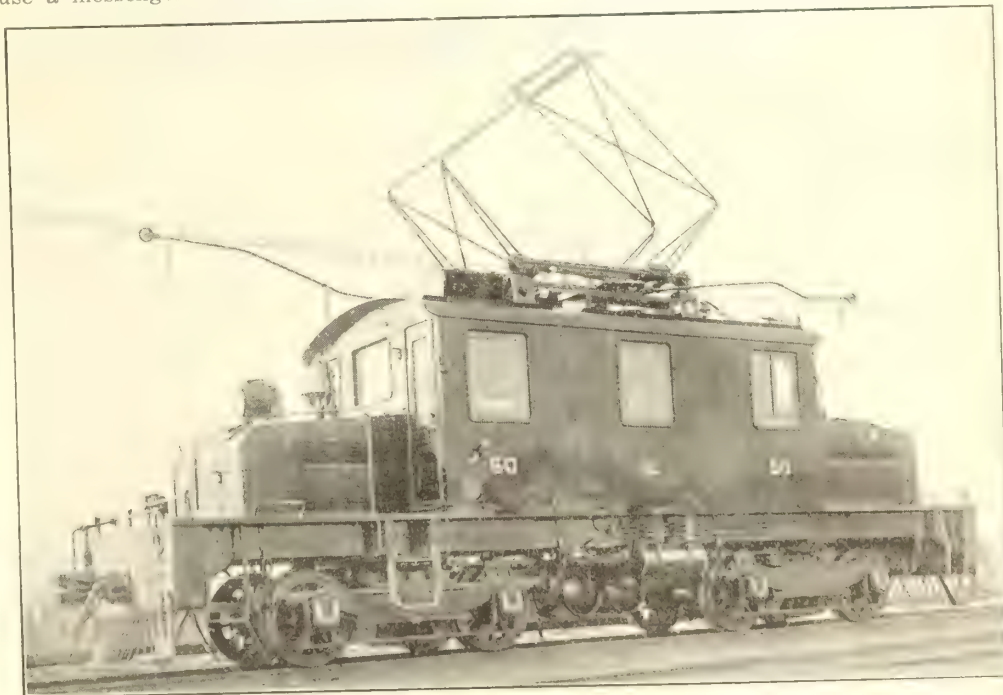
The use of aluminum cable steel reinforced avoids the necessity of having additional feeder cables with the accompanying insulators. The contact wire is 0000 B. & S. standard grooved, and is of double galvanized steel. It is supported by means of stamped steel hangers, having a stem designed in the form of a loop and is of stamped sheet steel galvanized. The loop fits over a stamped sheet steel clamp, so arranged that by tightening up the bolts it clamps the messenger cable. The arrangement affords a flexible suspension for the trolley wire at all points, and at the same time prevents any wear of the aluminum cable by reason of the constant sliding up and down of the flexible hanger. Electrical connections are provided for between the messenger cable and contact wire by means of a parallel groove clamp and 00 stranded, copper jumpers attached to feeder ears on the steel trolley.

The line is 51 miles long, with various sidings and passing tracks, 40 miles being tangent track. The grades are comparatively light, and the main line ones are all easy with the exception of a few short lengths near yards, which are 7° to 9°. Power for operation is obtained

in the near future, and that a heavy coal traffic will result. The line was completed from Galt to Brantford and put in operation on Feb. 7 of this year, to Simcoe on June 2, and to Port Dover on July 22. Connection is made at Galt with the Galt, Preston and Hespeler Ry., another C.P.R. subsidiary, which has been in operation for some years. This connecting road is operated at 600 volts and runs from Galt to Kitchener, Ont., with a branch line from Preston to Hespeler, 20 miles in all. The L.E. & N.R. was built to steam road standards, 85 lb. T. rails were used, and bonded with 0000 copper, electrically welded bonds.

In approaching the problem of electrification many very important considerations had to be kept in mind, in order to construct the line for electrical operation and to take advantage of the very latest practice in the type of system and overhead construction, bearing in mind minimum first cost, combined with durability, simplicity, and efficiency of operation. After a careful investigation of the various types of construction and kinds of material available, it was decided to operate the line at 1,500 volts. One of the reasons for adopting this voltage was the fact that the Galt, Preston and Hespeler Ry., with which the line connects, is operated on 600 volts, and there is a possibility that it will be changed over to 1,500 volts. At present, therefore, it is possible to run the L.E. & N.R. cars over the G., P. & H. Ry. at half speed, without changing the equipment. Later, when the connecting road is changed over to 1,500 volts, it will be possible to operate cars from Kitchener to Port Dover on one voltage. Another reason for the adoption of 1,500 volts as an operating voltage was the fact that substations with such a voltage could be arranged at long distances and would be few in number. The system now operates two permanent sub-

S. gauge copper wires throughout the length of the line, and in order to obtain the simplest possible construction, avoiding the necessity of additional feeder cables, insulators, etc., it was decided to use a messenger cable having the com-



Electric Locomotive, Lake Erie and Northern Railway.

bined qualities of maximum strength with the necessary conductivity for this purpose. Aluminum cable steel reinforced was therefore decided upon as a messenger cable. This cable consists of an extra high strength, double galvanized, steel core, around which are stranded 54 pure aluminum wires, the cross section of

from the Hydro Electric Power Commission at Galt, Brantford, and Simcoe. The power is received at the substations at 26,000 volts, 3-phase, 25-cycles, and is stepped down through transformers and changed by means of rotary converters to 1500 volts direct current. The substations at Brantford and Simcoe are now in

operation, and it is planned to use temporarily a portable substation at Galt, until such time as the connecting road is changed to 1,500 volt operation, when a permanent station will be erected at Preston.

Two 60-ton, Baldwin-Westinghouse electric locomotives, of the double truck type, mounted on 36 in. cast steel, steel tired wheels, are used for heavy traffic. The motors are of the Westinghouse 750 volt railway type, wound for and operated two in series permanently on 1,500 volts, and have a capacity of 94 kw. or 125 h.p. They are arranged for forced ventilation and are of the field control type. While air for cooling the motors is normally provided by a motor driven blower, each motor has a fan at one end of the armature which will furnish sufficient ventilation to operate the locomotive at three quarter capacity in case of accident to the blower. The control equipments used on the locomotives are of the electro pneumatic type. The various main circuit connections are made by individual or unit switches arranged compactly in a group and operated by compressed air. Master controllers are located at both ends of the locomotive cab. Each controller has two levers, one for notching up and one for reversing. The

should there be other equipments in operation at the time.

For passenger service 8 standard 60 ft., interurban cars are used; they consist of 6 motor cars and 2 trailers. Two of the motor cars are of the passenger and express type and are equipped with Westinghouse motors. The arrangement of equipment is such that 2 motors are permanently in series and the 2 pairs then operate in parallel, giving the cars a speed of 45 miles an hour. The control equipment is of the Westinghouse A.B. electro pneumatic type. The compressor and lighting systems are both operated direct from the 1,500 volt line, thus making the car a straight 1,500 volt one without any complications of dynamotor or other accessories. This equipment is more or less unique in this respect. All cars, both motor and trailer, are equipped on both platforms with master controllers, so that a train may be operated from any platform.

Sherbrooke Railway and Power Co's Report.

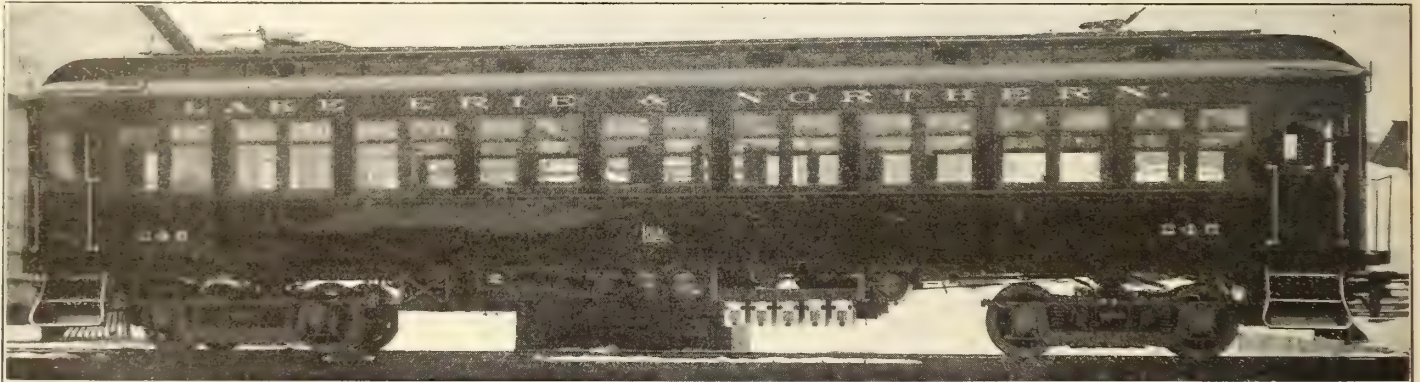
Following are extracts from the report for the year ended June 30:—The attention is called to the fact that owing to

Your directors regret to report the death of the late General Manager, N. C. Pilcher, who was killed while bravely fighting with his regiment in France. He was highly commended for his work by his commanding officer.

This summer, J. H. Trimmingham, the Superintendent, left for overseas service with the motor boat patrol, and Capt. Thos. Irving, the Assistant Accountant, with the 117th Eastern Townships Battalion. During Mr. Trimmingham's absence, Chas. Johnstone, a very efficient officer of the company, has been appointed acting Manager.

Profit and Loss Account for Year Ending June 30th, 1916.

Gross revenue from railway, power, light, real estate, rentals, etc.	\$140,069.11
Operation, maintenance, and management	73,719.41
Interest on bonds . \$54,525.00	\$66,349.70
Interest on gold notes	186.53
Interest on current liabilities	3,712.02
	\$58,423.55
Head office and legal expenses	\$1,426.92
Bad debts written off	246.42
Expenses and discount on note issue written off ..	2,533.76
	4,207.10
	62,630.65



Motor Car, Lake Erie and Northern Railway.

reverse lever is mechanically interlocked with the operating handle, so that it cannot be thrown unless the main drum is in the off position. The equipment also includes Westinghouse air brakes, which can also be operated by hand; air signal; foot gongs; two air whistles, and a locomotive bell with air ringer.

The locomotives are arranged for double end operation and have central cabs with sloping hoods at either end. The cab is of steel and is lined with wood. Steps and handholds are arranged to conform to the Board of Railway Commissioners' requirements. The two locomotives are very similar. One, however, is arranged for a speed of from 20 to 25 miles an hour, and the other for from 30 to 35 miles an hour, with normal load, on a straight, level track. The high speed locomotive, which is intended for passenger, excursion traffic, is equipped with regenerative braking, controlled by the same master controller that operates the unit switch control outfits. When used for regenerative braking the motor fields are separately excited by a motor generator set, which also drives the blower for ventilation. This system is so arranged by means of relays that as soon as the voltage of the motor is equivalent to the voltage on the line the switch group automatically comes in on the line and throws the motors directly on the line, generating back to the power system, or utilizes the power on the line

the adoption of the standard system of accounting approved by the National Electric Light Association, inter-company charges, that is to say bookkeeping entries, between the company and its subsidiary companies have been eliminated. This makes an apparent reduction in both gross receipts and operating expenses, but it will be noted that the net receipts show an increase notwithstanding the fact that conditions in the early part of the fiscal year were not satisfactory.

The acquisition of the lighting and power businesses of Waterville and Compton, combined with the increased demand for power in the second half of the year, have created a market in excess of the capacity of the company's hydro electric development on the Magog River. To provide for this increased demand for power and the probable requirements in the immediate future, your directors deemed it advisable to make a contract through the Southern Canada Co., Ltd., for the purchase of sufficient power to cover same and this should be available in October. A considerable quantity of this power has already been contracted for. An extension of the power house and some of the transmission and distributing systems has been rendered necessary to handle this additional power and this work is now nearing completion and should materially increase the earning power of the company for the current

At credit of profit and loss, June 30, 1915	\$3,719.05
	1,181.32

Balance carried forward to credit of profit and loss	\$4,900.37
--	------------

The gross earnings for the year ending June 30, 1915, were \$55,920.74.

Saskatoon Municipal Ry. Earnings.

Following are the earnings, etc., for August:—

Total revenue	\$15,526.13
Operating expenses	9,719.12
Net revenue	5,807.01
Capital charges	4,504.22
Net profit	1,302.79
Total mileage	64,386
Passengers carried	299,348
Receipts per car mile	23.569c
Operating expenses, per car mile	15.072
Capital charges per car mile	6.985c
Total k.w.h.	136,700
Passengers per car mile	4.642

We are officially advised in connection with recent press reports that the Winnipeg Electric Ry. was about to take action against the City of Winnipeg for permitting the operation of jitneys in the city to the damage of the company's interest, that while the matter had been under discussion no definite action has been decided upon. The company claims that the franchise granted it by the city is an exclusive one, and that the licensing of jitneys is a direct breach.

Answers to Questions on Electric Railway Topics.

Following are answers to some questions sent to the American Electric Railway Association's question box, contributed by W. G. Murrin, General Superintendent, British Columbia Electric Ry., Vancouver:—

Automobiles for Official Use.—Will member companies which operate a large number of automobiles for the use of their general officers, roadmasters, line-men and other employes, let us know what cost and performance records they keep; form of daily report, form of monthly report, form of summary for presentation to general and operating officers, what is shown, and how often made?

A daily report of car troubles is made by the garage foreman to the General Superintendent. The foreman retains one copy, and in addition to forwarding a copy to the General Superintendent, a third copy is sent to the Master Mechanic. A daily report of cars requiring special attention, such as general overhauling, worn parts, etc., is also made by the garage foreman to the General Superintendent. Weekly odometer readings and tire changes are reported, and this information is transferred to a ledger, which furnishes at a glance the mileage and tire history of a car. A tire and casing record, showing the date installed, the car number, where carried, date changed, reason for changing, reading and the number of miles, is used in conjunction with the ledger. A card record is kept of individual car maintenance costs, the information being furnished by the accountant. Monthly statements are made to the General Superintendent and the Accounting Department, showing,—mileage of all cars, distribution of power charges for batteries of electric vehicles, distribution of power charges for lighting and starting batteries on all vehicles.

Street Sprinkler Cars.—Have any member companies constructed in their own shops, or had constructed in outside shops under their own specifications, street sprinkler cars, if so, please describe in a general way, this equipment and its practicability?

In 1905 we constructed in our shops a 3,000 gal. capacity single truck sprinkler, consisting of an old 6x16 ft. return tube boiler with the tubes removed, mounted on a timber platform 26 ft. over bumpers by 7 ft. wide. Canopy hoods on pipe standards were built at each end. The trucks were built with each side frame made of two 1x3 in. bars forged around and over the journal boxes, and two over-truss rods of ½x3 in. iron, the space-blocks having bearings for six coil springs, on each side frame, which carried the car. The wheel base is 7½ ft. with standard 3¼x7 in. freight car journal boxes. The car is mounted on 33 in. rolled steel interurban wheels, with 5 in. axles carrying two G.E. 57 motors and is equipped with straight air brakes, 8x10 in. cylinder. Water is pumped from the tank to sprinkler heads at either end by a 4 in. centrifugal pump, belted to a 10 h.p. motor, and 250 ft. roadway can be easily sprinkled in one trip. The cost of this car is about \$2,800 complete.

Inspection of Hand Brake Equipment.—What methods of inspection have member companies adopted to keep in good order hand brake equipment on cars upon which air brakes are ordinarily used? Is the hand brake equipment overhauled at

regular intervals or is this left to the judgment of the car house foreman?

When air brakes are used it is a particularly difficult matter to enforce the use of hand brakes frequently enough to keep them from becoming stiff or clogged up, especially so at the floor bearings on the platform. We inspect hand brakes on city equipment at every periodical inspection or after every 90 car hours, and on interurban equipments after every 1,000 car miles. Transportation rules require on city lines that hand brakes must be tried out before car is taken out of the barn, and at least one stop with hand brakes made during each shift, at some suitable place on the route. Interurban crews must test hand brakes on taking over car at the barn, and operate car with hand brakes only, between barn and terminal station when taking it to and from service.

Regina Municipal Railway Earnings

Following are earnings, expenses, etc., for August, and for eight months ended Aug. 31:—

	August	Jan. 1 to Aug. 31
Gross earnings	\$14,679.13	\$137,327.56
Expenses	13,600.87	127,836.61
Net earnings	1,078.26	9,490.95
Capital charges	8,022.96	64,183.69
Deficit	6,944.70	54,692.74
Expenses per car mile		
without power	12.76c	16.09c
Expenses per car mile		
with power	17.02c	21.45c
Power per k.w.h.	1.41	1.83
Power per k.w.h. per car mile	4.25	5.16
Platform wages per car hour	70.41	72.46
Passengers carried	323,225	3,040,080
Expenses percentage, without capital charges. . . .		92.65%
Expenses percentage, with capital charges		147.31%

Quebec Railway, Light and Power Co's Accident Talks, Etc.

The Quebec Ry. Light and Power Co. has, since the end of 1914, been issuing "Accident Talks" for the benefit of its employes and the general public. The first of these was issued Nov. 1914, the first series consisting of five talks. The 1st asks the public to help the company to avoid accidents, and shows how they may do so; the 2nd shows how they may help the company and the travelling public when an accident happens; the 3rd contains suggestions to drivers of automobiles and other vehicles; the 4th relates to suits for damages, urging the public to come direct to the company with claims for compensation; and the 5th invites cooperation in the teaching of children in accident prevention. The second series of accident talks—10 in number—were issued bi-monthly between Nov. 1915, and Mar. 1916. The 1st is addressed to motormen; the 2nd refers to those who witness accidents, asking them to give the company all the facts; the 3rd points out that 90 per cent. of all accidents are brought about by carelessness, and urges carefulness and caution; the 4th calls attention to danger signals and their use; the 5th enforces the lesson "Wait till the car stops"; the 6th shows some of the ways in which accidents occur; the 7th is a talk on safety; the 8th "Don'ts" to be observed by parents and taught to their children; the 9th is addressed to drivers of autos and to parents, and the 10th is an appeal for cooperation.

In June and July of this year two leaflets, addressed to the company's employes were issued—the 1st dealing with

service and the 2nd with courtesy. They are all clear and concise, and full of fact and suggestion, and are printed in both English and French.

Brandon Municipal Railway Operating Results.

Following is a comparative statement for the year ended June 30, 1916 and 1915:—

Passenger earnings	\$28,590.05	\$35,321.64
Miscellaneous earnings	668.63	647.41
Gross earnings from operation	29,258.68	35,969.05
Total operating expenses . . .	28,660.23	28,394.87
Net income	\$598.45	\$7,574.18
Interest on funded debt	20,100.00	19,300.00
Interest on floating debt	25	267.34
Sinking fund	5,968.08	5,968.08
Depreciation	6,484.41	6,177.51
	32,552.74	31,912.93
Less net income	598.45	7,574.18
Net loss	\$31,954.29	\$24,339.75

Fare passengers carried	627,739	782,011
Average fare revenue passengers, in cents	4.52	4.52
Gross earnings per car mile . . .	12.43	13.33
Operating expenses per car mile	12.18	10.53

The increased net loss of 1916 over that of 1915 is due to the closing of the railway system for 10 weeks, during the excessively heavy snowfall last winter. Not only was the revenue nil during that period, but the city council decided that the motormen, conductors and car barn employes should be given employment for the whole of the time the system was closed.

Ontario Hydro Electric Railways.

Twenty-five Ontario municipalities will on New Year's Day vote on bylaws for a hydro radial electric railway to run between Port Credit, St. Catharines and Bridgeburg. Under an act of last session, it is necessary for the sanction of the Lieutenant-Governor in Council to be secured three months prior to the date of the vote so that the people can become cognizant of the matter on which the poll is being taken. The estimated length of the road is 100 miles, and its cost about \$40,000 a mile, or a total cost of about \$4,000,000. The order in council was passed at the request of the Hydro Electric Power Commission, following the recent meeting in Hamilton, where the delegates made a strong demand that preliminary work on the line be started. The route is through a rich section of agricultural country, and the line will touch the following places:—Townships: Toronto, Trafalgar, Nelson, East and West Flamborough, Barton, Saltfleet, North Grimsby, Clinton, Louth, Grantham, Crowland, Humberstone and Bertie. Villages: Grimsby, Beamsville, Port Colborne, Humberstone, Fort Erie. Towns: Oakville, Burlington, Welland and Bridgeburg. Cities: St. Catharines and Hamilton. The radial from Toronto would connect with the line at Port Credit.

Edmonton Municipal Railway Deficit.

For the first 7 months of 1916 the deficit on operation, including depreciation and capital charges, was \$63,010.78, against \$75,136.90 for the first 7 months of 1915, a betterment in results of \$12,126.12, which A. G. Harrison, City Commissioner, points out was in spite of the fact that the city decreased in population and that five battalions of her soldiers were in camp at Calgary and elsewhere during the summer.

Electric Railway Projects, Construction, Betterments, Etc.

Berlin & Northern Ry.—The Board of Railway Commissioners has approved of plans showing a change in the location of the company's crossing on Wellington St., to the south side of Louisa St., Kitchener, Ont., the work to be done at the company's expense. (Dec., 1913, pg. 592.)

Brantford & Hamilton Ry.—The Board of Railway Commissioners has authorized the company to rebuild its bridge across the Toronto, Hamilton & Buffalo Ry. at Cainsville, Ont. (May, 1915, pg. 190.)

The Board of Railway Commissioners has authorized the company to establish its Brantford passenger station in the Lake Erie and Northern Ry. station at Lorne Bridge, Brantford, Ont., subject to agreement with, and the consent of, the city to the building of an extension of its tracks from Market St. to the station.

British Columbia Electric Ry.—The Vancouver City Council decided Oct. 6 to ask the company to continue the double track line on Hastings St., to Boundary Ave.

A settlement was effected Oct. 5, between the company and the Silver Spring Brewery, Victoria, of the matters about which they have had a difference, and which reached the law courts. The company sought to secure payment for power supplied to the brewery, and the brewery set up in defence a 20 year old understanding that it was to receive power free, in consideration of the company having built part of its line on brewery property. The brewery company is to pay a sum for power, and the railway company is to give a strip of land 31 ft. wide for the operation of a double track street railway, and it will have the absolute right to operate trams upon this at all time. The settlement gives the brewery company, by moving its tracks out from their present position close to the wall of the building, a means of access and sufficient clearance to the shipping doors, with an easement across the tracks to this roadway and another clearance from the brewery to the office. (Oct., pg. 425.)

Edmonton Radial Ry.—A press report states that the Edmonton, Alta., City Council is preparing a bylaw to provide for raising of \$75,000 for street railway purposes. (Sept., pg. 378.)

Fort William Electric Ry.—The Fort William, Ont., City Council has under consideration a proposal to build subways at the west end of the city, in order to carry highways along which the street railway runs across 14 sets of tracks belonging to the C.P.R., the Canadian Northern Ry. and the Canadian Government Railways (Lake Superior Branch). The council favors the building of one subway on Yonge St., as a start, at an estimated cost of \$250,000. Plans for this are being prepared by the City Engineer.

Lake Erie & Northern Ry.—The Board of Railway Commissioners is being asked to approve of an agreement between the Brantford City Council and the company for the sale by the city to the company of a portion of the Grand Valley Ry., and the board has approved of the revised location of the company's line in Brantford from station 0-26.1 to 3.13.8.

The Mayor of Brantford has written M. N. Todd, General Manager, L.E. & N.R., asking the company to provide protection for the public at Holmedale crossing. (Oct., pg. 425.)

London & Port Stanley Ry.—The London City Council has agreed to provide a further sum of \$117,000 to make certain improvements on the line, including the building of about 12 miles of second track and providing a grain elevator at Port Stanley. (Oct., pg. 425.)

The London St. Ry., we are officially advised, is just completing the building of a second track on a 2,000 ft. section of Dundas St., west of the fair grounds, at London, Ont. It is expected at an early date to extend the Hamilton Road line from the present terminus at Egerton St. for 2,200 ft. to West St. (Sept., pg. 378.)

Montreal & Southern Counties Ry.—We are officially advised that the contract for the erection of a car barn at Granby, Que., which was let to the Nicholson Construction, Limited, is expected to be completed early in November. (Aug., pg. 378.)

Montreal Tramways Co.—The Board of Control is spending considerable time discussing the terms of a new franchise to be offered the company. At the rate the discussion is going on at present it will be some time before the terms are settled. The question of the employment of expert help in settling the terms is the subject of considerable discussion. The Board of Trade has appointed a committee to discuss the matter so as to be in a position to approach the City Council when the draft franchise comes before it. (Oct., pg. 422.)

Morrisburg & Ottawa Ry.—The following advertisement was published in Ottawa papers recently: "The Secretary-Treasurer of the above company will be at his office, 210-211 Union Bank Building, Ottawa, from 10 a.m. until 4 p.m. every day until Oct. 4, 1916, to receive payments or to make settlements with shareholders in arrears, and that (excepting such shareholders as against whom this company has judgment, or suits pending, or who have given promissory notes, or who have voluntarily made other satisfactory settlement) all shares other than as specified above upon which any call or part of call or other amount remains unpaid, on our books as of date Oct. 14, 1916, may be forfeited to the company, that such forfeited shares will be disposed of by the directors in such manner and at such times as may be deemed advisable and in accordance with the Statute of Ontario governing such sale of forfeited shares; and further take notice—That the Secretary-Treasurer of this company is the only authorized person to give receipts for money paid to the credit of this company and shareholders and others will govern themselves accordingly."

This company failed in securing from the Ontario Legislature last session an extension of time for construction. The company did some grading, but could not get further funds. In May, 1915, it began to take proceedings against its shareholders to recover unpaid instalments of calls and secured judgment against a considerable number of them. (June 1915, pg. 227.)

The Porcupine Rand Belt Electric Ry. Co. was incorporated by the Ontario Legislature in 1912 to build certain lines to be operated by electricity, and to connect with the Timiskaming and Northern Ontario Ry. at Dane, Ont. The company's organization was reported completed in Nov. 1912, and surveys were said to have

been completed by C. R. Fullerton, Liskeard, for some of the lines. Nothing further was heard of the project until Oct. 1913, when an unsuccessful application was made to the Ontario Government for a subsidy for building an electric railway from Haileybury to Lake Abitibi. A special general meeting of shareholders was called to be held in Toronto Oct. 16, to elect directors, to terminate a contract with the Porcupine Construction Co., to build two branch lines from Boston Creek to Swastika, and from the T. & N. O. R. via Larder Lake; and for other purposes. The secretary-treasurer of the company is W. J. James, Allandale, Ont., and the other officers and directors include several Toronto City Hall officials. (Nov. 1913, pg. 544.)

Quebec Ry., Light & Power Co.—The portions of this company's lines which are to be taken over by the Dominion Government, under the provisions of an act passed last session, have not yet, we are officially advised, been transferred, but are still being operated by the company, but on behalf of the Government.

We are further advised that the company has now under construction about 1.50 miles of new track in St. Malo and Linoilon wards, Quebec, and that it proposes to lay about 4 miles of city and suburban lines during 1917.

The company is adding a 2,000 h.p. motor generator to its equipment, from Canadian Westinghouse Co.

The St. John, N.B., Ry. is building a brick and concrete pumping station and doing some dredging in connection therewith at St. John, N.B. H. M. Hopper is General Manager, and G. G. Murdoch, Engineer.

Toronto Civic Ry.—We are officially advised that the 9-car addition to the St. Clair Ave. car barn is under construction and is expected to be completed at an early date. (Oct., pg. 425.)

Toronto Ry.—The gap between the Toronto Ry.'s northern terminus on Yonge St., just south of the new subway under the C.P.R., and the Toronto & York Radial Ry. Metropolitan Division's southern terminus on Yonge St., between Farnham and Woodlawn Avenues, the greater portion of which was caused by the city tearing up the T. & Y. R. Ry. track south of that point, on the expiration of its franchise some two years ago, has been closed up by the extension of the Toronto Ry. north to the point mentioned. Following the British Privy Council's judgment in favor of the company, the city did the paving and the company laid the ties and rails and did the overhead work. Through service was started Oct. 4, but after a few days was superseded for 3 days by a stub service north of the subway, pending some alterations in the overhead work in the subway. The Toronto Ry. cars run into a Y at Woodlawn Ave. and then back up Yonge St. to the T. & Y. R. Ry. terminus. (Oct. pg. 425.)

The North Toronto Ratepayers' Association, on Oct. 21, passed a resolution calling for the expropriation of the Toronto & York Radial Ry., Metropolitan Division. The question of the future of this division is at present a matter of negotiation between the company and the Hydro Electric Power Commission of Ontario, at the request of the City of Toronto, the city council desiring to purchase it.

The Toronto and York Radial Railway's Deviation to its North Toronto Station.

The judicial committee of the Imperial Privy Council has allowed the Toronto & York Radial Ry. Co.'s appeal from the decision of the Ontario Appellate Court, relating to the proposed deviation of the company's tracks from Yonge St. to its proposed new station off Yonge St., between Farnham and Woodlawn Aves. This matter has been bandied about for several years, in fact, ever since the question of the separation of steam railway grades at North Toronto was mooted, and which latter is now an accomplished fact.

On June 17, 1912, the Ontario Railway and Municipal Board authorized the Metropolitan Ry. (owned by the T. & Y.R.R.) to deviate its line from Yonge St. to a private right of way from Farnham Ave. to a proposed new terminal 800 ft. west and north of the C.P.R. This location showed the crossing of several streets on the level, and the speed of cars crossing them was limited to six miles an hour. The board held that it was not reasonable to compel the company with its earnings to spend \$500,000 on grade separation, more especially as the municipalities refused to contribute anything. The City of Toronto appealed against the order in Feb., 1913, and the Ontario Court of Appeal decided in favor of the city. The company then appealed to the Privy Council, and its appeal was dismissed in Nov., 1913. The company then applied to the Ontario Railway and Municipal Board for authority to deviate from Yonge St. to a proposed new terminal at Farnham Ave., and this authority was granted. The city appealed against the board's order, and the Ontario Court of Appeal decided in favor of the city. The company immediately gave notice of appeal to the Privy Council, and this has resulted in the present decision in favor of the company.

A cable dispatch from London, summarizing the judgment, states:—

"The appellants for the purpose of operating the railway have the franchise which they claim in respect of the street and adjoining the lands proposed to be used, and the committee of the Privy Council determines in their favor the question on which Judge Garrow preferred not to give a final opinion.

"On the second point, concerning the obtaining of the consent of the city council before the Ontario Railway and Municipal Board could approve the plans, the judgment says it is clear that before construction is commenced the plans setting forth the proposed location of the tracks must be approved by the committee appointed by the city council, and the location cannot subsequently be altered without the consent of the committee. There is further protection that the line shall not be put in operation upon any section until the City Engineer has certified such section has been constructed in compliance with the terms of the agreement. It must be assumed that all these conditions were fulfilled before the line was put in operation.

"In the present case the board before approving the plans of the appellants took care to ascertain whether they were satisfactory on engineering grounds to the city. They considered the objection of the city on engineering grounds, procured a report thereon of their own engineer,

and before approval amended the appellants' plans to conform with the objections made on behalf of the city. In effect, there was no difference on engineering grounds between the city and the appellants when the board finally approved the plans for carrying the spur line on the level across the sideway on the west side of Yonge St. In the event of any difference arising between the city and the appellants as to any matter to be done under the terms of the agreement, the agreement contains an ample arbitration section. Their Lordships are of the opinion appellants succeed, with costs here and in the court below."

Sandwich, Windsor and Amherstburg Ry. Employes Wages.

S.W. & A.R. conductors and motormen, who have been agitating for an increase of wages, applied recently for a board of investigation and conciliation under the Industrial Disputes Act. They named Magnus Sinclair, of Toronto, as their arbitrator. The company named E. G. Henderson, of the Windsor Salt Co., as its arbitrator, and the Minister of Labor appointed the County Judge of Essex County as the third arbitrator and Chairman. The present wages per hour are, 1st six months, 25c; 2nd six months, 26c; 2nd year, 27c; after 2nd year, 28c. The men asked increases as follows: 1st six months, 27½c; next six months, 32½c; thereafter, 35c.

The men's demands were made in the form of a draft agreement submitted to the company, which is summarized as follows: The agreement to be between the Sandwich, Windsor & Amherstburg Ry. and the Windsor & Tecumseh Ry. Companies and the Amalgamated Association of Street & Electric Railway Employes of America, Division 616. All business arising between the companies and the association to be transacted directly between the companies' officers and the association's officers and committee. All the companies' employes to become members of the association within 30 days from the signing of the agreement and all employes entering the companies' service to become members within 30 days from date of entering the service. The day's work for all motormen and conductors to be from 9 to 10 hours, to be completed within 12 consecutive hours. The runs to be divided as nearly equal as possible between two crews, to be known as early and late runs. Wages of motormen and conductors per hour to be as follows: 1st 6 months service, 27½c; next 12 months, 32½c; thereafter, 35c. Where an employe is suspended or discharged, and after an investigation it is proved that there was not sufficient cause for suspension or discharge, he shall be reinstated in his former position and paid for all time lost at same rate as if he had been working on the car. If any difference arises between the companies and the association that cannot be amicably adjusted between them, it shall be submitted to three arbitrators, one selected by the companies, one by the association and the third by the first two named, the finding by a majority of the arbitrators to be final and binding upon both parties. All cars to be cleaned, oiled and put in good condition by barn men, relieving conductors and motormen from such duty. All cars to be equipped with good power brakes, automatic fenders and modern improved sanders. All conductors and motormen to be supplied by companies with one sum-

mer uniform yearly, consisting of hat, coat, waistcoat and trousers, and winter uniform of cap, overcoat and trousers. Extra conductors and motormen to be guaranteed 5 hours each day, whether they work or not, provided they are ready for duty and report at the companies' offices each day for work. The agreement to be in force for one year from signing.

The board commenced its sittings Oct. 21, but no decision had been reached at the time of writing, Oct. 25.

Shareholders Suit Against Dominion Power and Transmission Co.

The action of C. W. Moodie, Hamilton, Ont., against W. C. Hawkins, Vice President and Managing Director, and other directors of the Dominion Power & Transmission Co., asking for the appointment of a receiver and an adjustment of the company's affairs, came before Mr. Justice Middleton at a special sitting of the Supreme Court of Ontario at Hamilton, Oct. 3. After the case had been before the court for three days a settlement was arrived at, the terms of which were not made public, but it is said they include the taking over by the President of the D. P. & T. Co. of all C. W. Moodie's interests in the company, for which the Hamilton Spectator says he is to receive \$185,770.

The statement of claim set out that C. W. Moodie held 1,290 shares of preferred stock and 2,211 shares of limited preferred stock in the D. P. & T. Co. The plaintiff alleged that since the incorporation of the company, its official representatives have secured large financial interests in auxiliary companies through the fraudulent use of money belonging to the shareholders of the D. P. & T. Co., and that because of the securing of these side interests at an excessive cost, the directors of the company have suffered great loss. The plaintiff asked for the appointment of a receiver and the adjustment of his financial interests in the company.

An action similar in many respects to this was taken against the D. P. & T. Co. some months ago by John Moodie, of Hamilton, who claimed that the company owed him about \$7,000 on back dividends. After a lengthy trial the action was dismissed.

Municipal Electric Railways Operations in Western Canada.

The Saskatoon, Sask. Phoenix says:— "The Brandon Municipal St. Ry. has proved an expensive luxury, and, it is estimated by the civic authorities, has cost the city approximately \$50,000 this year, an average monthly loss of about \$4,000. The street railway of Regina municipality has cost that city \$40,000 to operate so far this year. The Lethbridge Municipal Ry. has cost approximately \$8,000. In practically every city in Western Canada the municipal street railways are proving themselves to be merely sink holes for public funds.

"The street railway system in Saskatoon, which at one time was regarded as a losing proposition, has so far this year shown a profit of \$7,000. Part of the profit is undoubtedly due to the profitable operation of the exhibition route during part of last winter when the military were stationed at the grounds, but apart from that, the local street railway is a paying concern. Editorials appear in

the daily papers of some of the western cities that are paying through the nose for their street car service, and one of them, at least, has a very hopeless tone. It speaks as though it were impossible to make that particular street car system pay. Saskatoon went through a similar process of reasoning, but the council became determined that the street car system must be made to pay and instructed the street railway superintendent to that effect. The kicks of particular sections of the city that wanted a street car service entirely out of proportion to the amount of traffic carried were disregarded to a great extent and the system was run on business-like lines. It has been a success ever since. The use of the expensive, power-hungry double truck cars was discontinued in a great measure, and the routes were somewhat reorganized by competent people. The result has been that the present car service here is on time, efficient and paying."

Mainly About Electric Railway People.

W. E. Skead has been appointed City Purchasing Agent, Brandon, Man., and will make purchases for the Brandon Municipal Ry.

Redmond Quain, Director, Ottawa Traction Co., Ottawa Electric Ry. Co., and Ottawa Car Manufacturing Co., died at Ottawa, Oct. 5, aged 56.

C. F. Waugh, has been appointed Agent, Chatham, Wallaceburg and Lake Erie Ry., Chatham, Ont., vice R. M. Dunlop, resigned to enter G.T.R. service.

W. C. Hawkins, Vice President and Managing Director, Dominion Power & Transmission Co., Hamilton, Ont., has been elected a Director of the Southern Canada Power Co.

The Public Utilities Commission of Port Arthur, Ont., which operates the Port Arthur Civic Ry., has advanced the salary of the Manager, M. M. Inglis, from \$150 to \$175 a month.

W. T. Woodroffe, formerly Superintendent, Edmonton Municipal Ry., who went overseas some time ago in the Canadian Expeditionary Force, is reported to have been killed in action.

Geo. Kidd, General Manager, British Columbia Electric Ry., returned to Vancouver recently after a three months official trip to England, and was given a general welcome by the staff at a reception.

B. Greenway, General Foreman, Regina Municipal Railway, is now looking after both track and overhead work. T. McGuinness, Overhead Foreman, having enlisted, that position has been abolished.

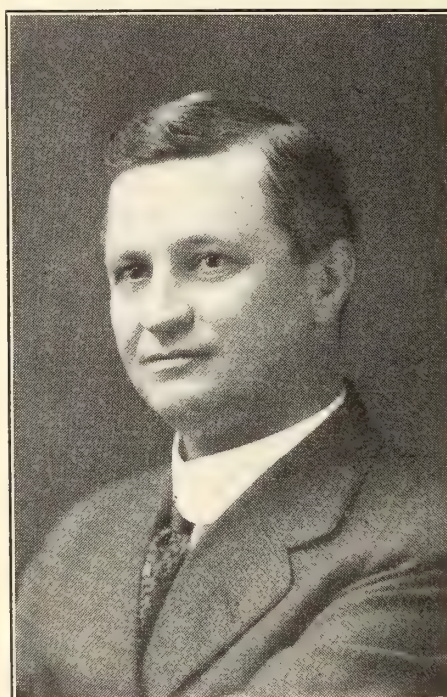
C. H. Ritchie, K.C., who died at Toronto, Oct. 3, aged 65; was one of the arbitrators engaged in the settlement of the dispute between the City of Toronto and the street railway company, regarding the amount to be paid by the city in taking over the system, prior to the formation of the present Toronto Ry. Co.

E. L. Cousins, A. M. Can. Soc. C. E., General Manager, Toronto Harbor Commission, has declined to act for the Montreal City Council in reference to the street railway problem there on account of the extra demands on his time caused by the large number of the commission's staff who have gone into the Canadian Expeditionary Forces.

Thomas Penney, a former President, and for a number of years General Counsel, International Ry., Buffalo, N.Y., which company operates the Niagara Falls Park & River Ry. in Canada, has been appointed a Vice President, in addition to the present Vice President, E. J. Dickson. He resigned as President in Jan., 1913, but continued as a director. He was born in London, Eng., and went to the United States as a boy.

Three Rivers Traction Co's Lines and Equipment.

The Three Rivers Traction Co.'s Cap de la Madeleine extension which will serve the populous district across the St. Maurice River from the City of Three Rivers, Que., is expected to be in operation in November if sufficient men can be obtained to complete the ballasting. The terminus will be near the Union Bay Co.'s large new paper and pulp plant and the



C. L. Wilson
Assistant Manager, Toronto & York Radial Ry.,
and Vice President, Canadian Electric Railway
Association.

Cap de la Madeleine Parish Church's pilgrimage grounds.

With the opening of the new branch the company's total track mileage, including the Wayagamack Branch, will be 42 miles—comprising 7,500 ft. of 60 lb. rail track, and 14,750 ft. of 75 lb. rail track. All special work is of flange bearing manganese construction. The overhead construction is the usual cross span, direct suspension system with 000 trolley and aluminum feeders. 4/0 gas-weld bonds are used throughout.

The car storage shed has been increased by 4,500 sq. ft. to accommodate new equipment and additional stores facilities required.

The new equipment ordered for the extension service comprises two of the company's standard prepayment rear-side, radiax truck cars operated entirely by one man. A third standard car has been purchased, differing only in that a duplicate control equipment has been placed in the rear end to facilitate reverse direction running in shuttle service. These

three cars are equipped with K control for two Westinghouse 101-B2 motors, together with s.m.e. air brake.

A snow plough with steel nose operated pneumatically and with a large wing for street cleaning has been ordered to handle the usual drifts on the new branch. In other service this car may be used for package freight or switching. It will be equipped with four Westinghouse 101-B motors and h.m.m. brake equipment.

At two steam railway crossings derail protection, with signal light has been provided.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry., and allied companies:—

	July 1 to Aug.'16	Aug.'15 to Aug.'16	Aug.'16 to Aug.'16	July 1 to Aug.'16
Gross . . .	\$550,293	\$507,126	\$1,088,586	\$1,017,849
Expenses . .	476,159	487,392	951,252	971,273
Net	\$ 74,134	\$ 19,734	\$ 137,334	\$ 46,576

Cape Breton Electric Co.—

	Aug. 1916.	Aug. 1915.	Aug. 31, '16.	Aug. 31, '15.
Gross	\$35,264.46	\$33,225.71	\$385,278.88	\$338,506.24
Exp.	19,184.77	18,159.39	225,931.96	206,902.58
Net	16,079.69	15,066.32	159,346.92	131,603.66

Dominion Power and Transmission Co.—The gross earnings of this company, which controls all the electric railways operating in and radiating from Hamilton, Ont., for the months ended Aug. 31, were \$1,768,625; expenses \$951,508; net earnings \$817,117; reserves \$109,888; bond interest \$289,447; other interest \$25,677; balance \$443,458.

Levis County Ry.—The annual meeting was held at Levis, Que., Oct. 19, when the report for the past financial year was adopted. The board for the current year is,—S. H. Ewing, President; Hon. Richard Turner, Vice President; E. A. MacNutt, Secretary; A. Kingman, John Forman, J. C. Blouin and G. E. Allen-Jones.

Montreal and Southern Counties Ry.—The following board was re-elected for the current year at the annual meeting recently,—E. J. Chamberlin, President; Frank Scott, Vice President and Treasurer; J. A. Yates, Secretary; W. H. Ardley, Comptroller; and W. H. Biggar, K.C. W. B. Powell is General Manager.

Sherbrooke Railway and Power Co.—

	July, 1916.	July, 1915
Gross earnings	\$14,110.79	\$12,559.07
Expenses	6,310.48	5,682.76
Net earnings	7,800.31	6,876.31

Toronto Railway—

	1916	City percentage	1915	City percentage
Jan.	\$473,784	\$68,847	\$471,226	\$70,486
Feb.	470,764	70,614	440,313	66,047
Mar.	518,555	97,237	488,468	98,141
Apr.	496,172	99,234	467,701	93,540
May	500,314	100,063	468,953	93,790
June	467,086	93,417	450,582	90,116
July	469,845	93,969	449,108	89,821
August	474,814	94,964	447,968	89,598
Sept.	506,621	40,530	489,574	39,166

\$4,377,966 \$758,875 \$4,173,893 \$725,700

Toronto Ry., Toronto and York Radial Ry., and allied companies:—

	Aug.'16	Aug.'15	Aug.'16	Aug.'15
Gross . . .	\$889,241	\$762,627	\$7,092,229	\$6,345,703
Expenses . .	462,179	365,093	3,634,674	3,280,047
Net . . .	427,062	397,534	3,457,555	3,065,656

Winnipeg Electric Ry.—

	Aug.'16	Aug.'15	Aug.'16	Aug.'15
Gross . . .	\$249,795	\$251,189	\$2,193,957	\$2,251,467
Expenses . .	163,860	182,512	1,402,927	1,481,593
Net . . .	\$ 85,935	\$ 68,677	\$ 791,030	\$ 769,874

The commission in charge of the building of the Toronto-Hamilton highway is said to be considering the operation of a motor bus traffic on the road.

London and Port Stanley Railway Operations, Equipment, Etc.

Sir Adam Beck, Chairman, Hydro Electric Power Commission of Ontario, and London Railway Commission, attended a meeting of the London, Ont., City Council, Oct. 16, and is reported to have said that the city's auditor had been at work for some time on the L. & P. S. R. accounts. He was in a position to read a statement of the finances of the road which the auditor will no doubt verify. It shows that operating expenses for the first year were \$100,197.48. Taxes, interest, sinking fund and rental to the city reduced this by \$76,542.72, leaving a net income from operation of \$23,672.76. A donation of \$1,300 was made to the British Red Cross, and sinking fund that accrued on debentures during the six months construction period before a wheel was turned or a dollar earned amounted to \$5,439.58. The actual net surplus in the hands of the commissioners at the termination of their first year was, accordingly, \$18,233.18. The commissioners now have on hand over \$50,000, about \$32,000 representing the surplus earnings over operation since July. This will enable the commissioners to meet the expenditure on the bathhouse at Port Stanley and other improvements, and will reduce the amount for which it is proposed to issue debentures.

The London City Council had before it recently bylaws to provide for the expenditure of \$75,000 for building two steel motor and three trailer cars for the line, and of \$42,000 for second track work, a bathing house at Port Stanley found necessary to provide further office accommodation and the latter bylaw was amended by the addition of \$8,000 to the amount authorized to be expended upon improvements, making a total of \$125,000. The original bylaw was to authorize the council to raise this amount by the issue of debentures, but after Sir Adam Beck's statement above referred to, the bylaw was amended to authorize the council to issue debentures for such an amount of the whole expenditure of \$125,000 as the commissioners may not be in a position to meet out of surplus earnings.

The London City Council on Oct. 2, on the Board of Control's recommendation, and at the request of the London Railway Commission, authorized application to the Ontario Railway and Municipal Board for permission to issue debentures for \$75,000 for the purpose of purchasing two steel motor and three trailer cars.

On behalf of the London Railway Commission, the Hydro Electric Power Commission of Ontario has prepared plans and specifications for 3 additional all steel motor cars for the L. & P. S. R., and is receiving tenders for them, to Nov. 2. It is intended to have the cars delivered in April, 1917. The cars will, in the main, be similar to those already in operation on the line, and which were illustrated and described in Canadian Railway and Marine World for Jan. 1915. They will, however, be 10 ft. 7 ins. longer, and will have a number of improvements, all making for the increased comfort of the passengers. Among the improvements will be larger and more convenient lavatories, large water cooler with sanitary drinking cups, rubber tiling for flooring of lavatories, rubber matting over trapdoors, heavier fittings generally throughout the car, sliding doors leading from platform to main car body,

spring buffers at each end of car, steps at both ends of car, larger doors of the sliding type over steps leading into the baggage compartment, two collapsible seats in the baggage compartment for additional seating capacity for passengers not carrying baggage, and a trainman's locker in the baggage compartment opposite the switchboard cabinet. There are also a few changes in the design, tending toward simplification of construction, lowering maintenance cost, and general efficiency. The cars will be divided into three compartments, main, smoking and baggage. Following are the chief dimensions:—

Length overall	71 ft. 7 ins.
Width over sheathing	9 ft. 6 ins.
Height from rail to top of roof	13 ft. 6 1/4 ins.
Total seating capacity	68
Total weight, including all equipment.	104,720 lbs.

Toronto Suburban Railway.

Some little work is being done on the extension of the line from Lambton to Guelph, but it is being done slowly and with a small staff. It is unlikely that the line will be opened for traffic this year, but if it were opened, the cars on the extension would only run from Lambton, as it is not probable that the change in gauge in the line from Keele St., Toronto, to Lambton, will be made during the winter. There is a general impression that a change of ownership is pending, and that possibly the line will be taken over by the Hydro Electric Power Commission of Ontario, on behalf of the municipalities interested.

The Ontario Railway and Municipal Board on Oct. 12 considered the company's plans for an extension of its line from its present easterly terminus at or near Bathurst St., easterly along Davenport Road. It had already been agreed by the parties that the route plan and profile easterly to the north limit of Bridgeman Ave. were unobjectionable, and the Board had decided to issue an order in respect thereof, but the plans in respect of the proposed track easterly from the north limit of Bridgeman Ave. had been by agreement left for further consideration. The plan of cross section filed is objected to on several grounds by the city, chiefly on account of the proposed method of construction. The company's plans showed the tracks laid in broken stone ballast throughout the entire length, and the type of rail used, as 60 lb. T rail. The city contended that the tracks throughout the entire length must be laid on a concrete base 15 in. thick, and with 90 lb. girder rail. The Board's engineer was instructed to report on the proposed work, and advised that regarding the work along the portion of Davenport Road which is macadam, that is from Bathurst St. to Kendal Ave., and from the east side of Huron St., to the north side of Bridgeman Ave. the track be laid in stone ballast on a well rolled subgrade, the ballast to be 6 in. thick under the ties and thoroughly tamped; the rails to be of the ordinary T section, 70 lbs. a yard, ties to have at least 6 ins. of bearing surface and spaced 2 ft. centres; space between rails and for 18 ins. outside each outer rail to be filled with macadam. In the event of any portion of this section being paved in the future it would be advisable to take this ballasted track up and replace it with deep rails and concrete base. For that portion of Davenport Road between Kendal Ave. and the west side of Huron St., which is now paved with asphalt block, standard concrete base 15 ins. thick, and

there is no reason why the deep 7 in. T rail, 90 lbs. a yard, should not be used, as it would conform to the ordinary T rail construction on either side, but objection may be raised to the rail.

It was urged by the city that in anticipation of the part of Davenport Road now laid in macadam being paved at a future time, the standard of track construction recommended by the engineer, for the paved portion, be adopted for the macadamized portion as well. In view of the interpretation of the city's agreement with the company, the Board could not concede this contention, but orders that if a new plan of cross section conforming to the terms of the engineer's report is filed with the Board, it, with the location and profile now on file, will be approved. (Oct., pg. 425.)

Electric Railway Notes.

The Levis County Ry. is reported to be building 2 single truck cars, 32 ft. long, in its own shops at Levis, Que.

The Toronto City Board of Control has recommended that the minimum wages of conductors and motormen on the Toronto Civic Ry. be increased from 27 7/9c to 30c an hour.

The Women's Forum, of Vancouver, B.C., decided Oct. 14, to join with the Social Service Council in bringing before the city council certain information which had been gleaned with regard to the jitney traffic in relation to morals.

Winnipeg City Council cancelled about 50 jitney permits recently on account of complaints made by the morality department. The jitney men are making a test case to determine the city's right to cancel the licenses.

The British Columbia Electric Ry.'s technical school was resumed for the winter session, Oct. 4. The company bears the cost of the school and grants certificates to those who pass the examinations. Prizes are provided by G. Porter, Chief Electrical Engineer.

Among the Express Companies.

K. Copeman has been appointed route agent, Dominion Ex. Co., Winnipeg.

F. R. Lount has been appointed agent, Canadian Ex. Co., St. Thomas, Ont., vice V. J. Smith.

J. Bayley has been appointed route agent, Dominion Ex. Co., London, Ont., vice O. A. Sharp, transferred.

O. A. Sharp, heretofore route agent, Dominion Ex. Co., London, Ont., has been appointed acting agent there.

The Canadian Ex. Co. has extended its service over the Grand Trunk Pacific Ry., Biggar-Battleford, and Battleford-Cut Knife branches, and has opened offices at Battleford, Lawson and Riverhurst, Sask.

The Canadian Northern Ex. Co. has opened offices at East Selkirk and Oakland, Man.; Browning, Carmel, Chandler, Drapmore, Fairmount, Forgan, Hardy, Margo, Merritt, Ridpath and Sturgis, Sask., and Cardiff, Alta., and has closed its offices at Bates, Que., and Chaffey's Locks, Ont.

The Great North Western Telegraph Co. has opened offices at St. Ulric, Riviere Blanche, Que.; Drapmore, Oakland, Man.; Carmel, Dorgan, Hardy, Willowbrook, Sask.; and Cardiff, Alta., and has closed its offices at Pointe au Pic, Que.; Kingville, Royal Muskoka Hotel, Ont.; and Sangudo, Alta.

Marine Department

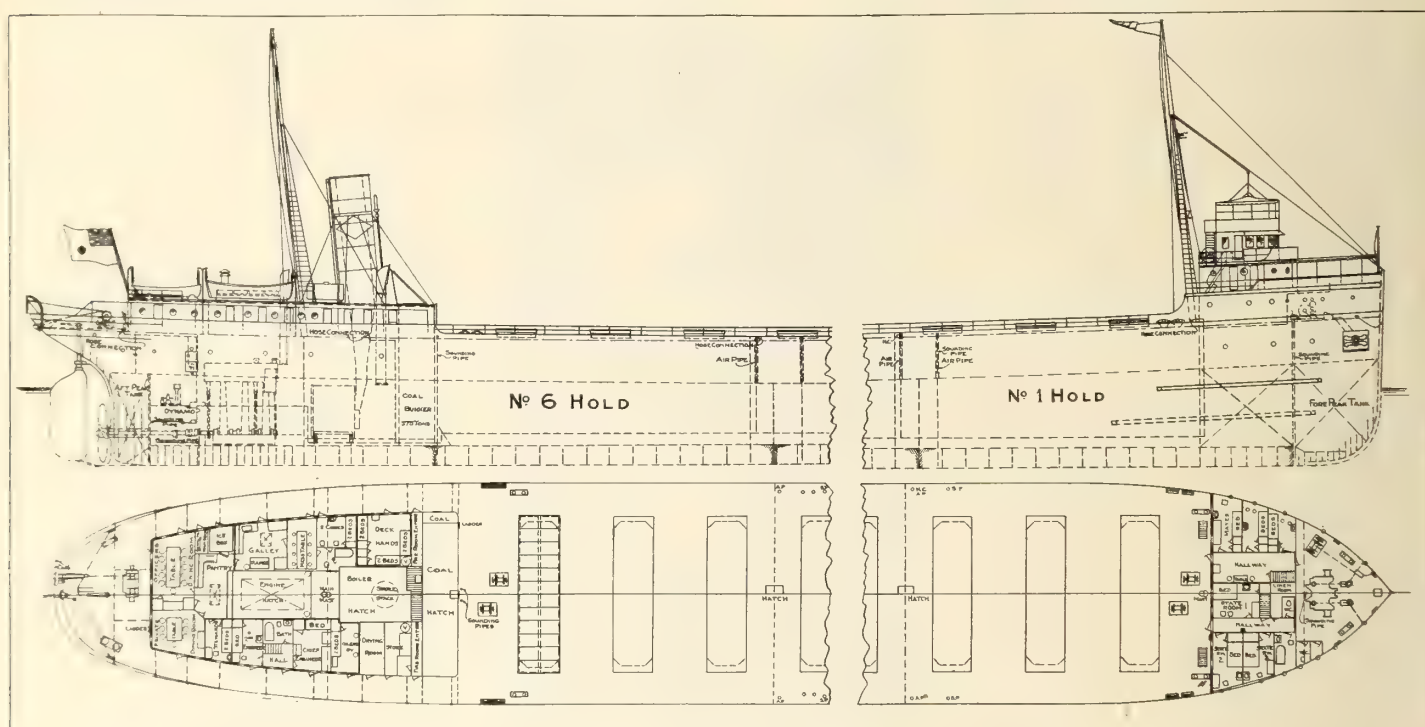
New Steamship for Montreal Transportation Company.

The steamship which is under construction at Collingwood, Ont., for the Montreal Transportation Co. is of the single deck type, which has been evolved to meet the requirements of the Great Lakes in regard to the transportation of coal, ore and grain. The leading dimensions are:—Length over all 550 ft. 8 in.; length between perpendiculars 537 ft.; breadth moulded 58 ft.; depth moulded 31 ft.; deadweight capacity, on 19½ ft. draught, 11,000 tons.

The vessel is of steel throughout, to the highest class for the Great Lakes Register, the weights of materials being, in many cases, in excess of the registration requirements. In common with other

sulted for mechanical unloading operations. The tank top plating, which carries the weight of the cargo, is supported by a centre girder and 4 longitudinal girders on each side of the centre line. Intercostal deep floor plates are fitted in the transverse direction on every second frame, that is, 6 ft. apart, there being a deep floor plate at each girder, and one between. There are two complete collision bulkheads forward, the space between these forming a deep tank. The cargo hold is divided by screen bulkheads into 6 compartments, and the double bottom by 4 watertight divisions into 5 compartments for water ballast. The remaining bulkheads are, a cross bunker

weight. The anchors are stowed in pockets so that they may not foul lock gates or other possible obstacles in navigating narrow waters. The main and emergency steering engines are situated right aft on the main deck. Both gears have 9x9 engines, and actuate the rudder directly through a toothed quadrant directly connected to the rudder. Both gears are controlled by a wire transmission led from the bridge, and a clutch arrangement is provided so that either gear can be put in and out of operation on short notice. Four winches are fitted for breasting the vessel, and one heavy winch is fitted aft to handle stern lines and a kedge anchor as necessary.



Plan and Profile of Montreal Transportation Co.'s New Vessel.

vessels of her class, she embodies many features to facilitate rapid loading and unloading, the short season on the lakes making quick dispatch in port a matter of the utmost importance. No loading or discharging appliances are provided on board, these operations being accomplished by appliances on shore. There are 16 cargo hatches, each 38 ft., by 9 ft. 4 in., spaced 24 ft. centre to centre. Between the hatchways strong arch girders extend right across the vessel, the adoption of which dispenses with the use of stanchions, and the holds are left unobstructed, a necessary feature where coal and ore cargoes are unloaded by clam shell buckets. The ordinary bottom and side transverse frames are of channel section spaced 3 ft. apart. The double bottom, 5 ft. deep, extends the full length of the vessel between the peak bulkheads. The side tanks are of the same width and extend on each side up to the level of the main deck stringer, thus forming a double skin well above the deep load line. The well tanks provide a large additional capacity for water ballast, while the centre plating transforms the hold into a compartment of hopper form, eminently

screen bulkhead, a screen bulkhead between the engines and boilers, and watertight afterpeak bulkhead.

A short forecabin is fitted above the upper deck, right forward, in the port side of which are arranged cabins for the first and second officers, the quartermasters and watchmen. In a corresponding position on the starboard side are the owners' staterooms. On the forecabin deck above is situated a large steel deckhouse containing an observation room and the captain's quarters. The top of this house forms the navigating bridge, upon which stands the wheel house. The accommodation provided at the after end of the vessel is arranged in a large steel house surrounding the engine and boiler casing, and includes engineers' quarters, galley, dining rooms for owners, officers and crew respectively, and berths for the crew. The firemen's accommodation is on the main deck just abaft the engine room casing.

A powerful steam windlass of the quick warping, direct grip type is located on the upper deck under the forecandle. The cables are 2½ in. diam., each being attached to a stockless anchor of 8,000 lbs.

The hatch covers are of 4 in. spruce. On previous vessels of this class steel telescopic hatch covers were used for quick handling, but after the loss of so many vessels on the Great Lakes in Nov., 1913, during the storm when the s.s. James Carruthers was among the number, a great many owners have preferred to go back to the heavy and more unwieldy wooden covers. Heavy steel strong backs are fitted athwartships to lend additional support to the covers. Another feature in this vessel is that the engine and other skylights have been made entirely of steel instead of wood, and 16 in. circular deadlights have been fitted in the deckhouses in lieu of the square windows formerly adopted in this type of vessel. The deckhouses have been specially stiffened to stand excessive abuse.

The boat outfit includes two 22 ft. metallic life boats, and one 18 ft. gasoline launch for use in harbor. All boats are placed aft on a level with the deckhouse, attached to sliding davits, and fitted with patent releasing blocks. The vessel has two steel pole masts, one forward and one aft, for signalling purposes and to carry the running lights. Awnings are

fitted over the forecastle deck and pilot houses. Draught gauges are placed at each end of the vessel, so that the draught forward and aft may be read at the same time. The vessel is lighted throughout by electricity, the total number of lights being about 200. For providing the necessary current, two electric generators, each with a capacity of 10 kilowatts, are fitted at the after end of the main engine room.

The propelling machinery, located at the after end of the vessel, consists of a single set of triple expansion reciprocating engines, with cylinders 24, 40 and 66 in. diam., by 42 in. stroke, capable of de-

veloping 2,400 i.h.p., and of driving the vessel 13 miles an hour when loaded. Steam is generated by three single ended boilers of the Scotch marine type, each 13 ft. diam., by 11 ft. long, designed for a working pressure of 185 lb., on the forced draught system. The machinery includes 1 centrifugal and 2 duplex ballast pumps, 1 sanitary pump, 1 duplex main feed pump, and 1 duplex feed and fire pump. The air circulating and bilge pumps are directly driven from the main engines and in addition to these, a hand bilge and fire pump are also provided.

The vessel is being built by the Colingwood Shipbuilding Co., Ltd.

The Hochelaga-Etoile Collision.

An investigation into the causes of the collision between the s.s. Hochelaga, owned by Furness Withy and Co., and chartered to the Dominion Coal Co., and the paddle wheel steamship Etoile, near the Platon buoy in the St. Lawrence River, July 19, was held at Montreal recently, before Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. C. Lapierre and J. O. Grey as nautical assessors. The evidence showed that the Hochelaga, which was fully equipped, was bound from Montreal to Sydney light, and was in charge of a pilot. When steering for Portneuf light, a vessel's lights, white and red, were observed on the starboard bow, about 1½ miles off. After reaching the Portneuf light a change of course was necessary, which brought the lights of the other vessel, which was the Etoile, on the port bow, the vessels being about 600 or 700 ft. apart, when all at once the green light was perceived. The Etoile then blowing 2 or 3 blasts was answered by 1 blast from the Hochelaga. A one blast signal and full speed astern orders were given on the latter vessel, but the Etoile came on for the port bow and the impact followed. The master stated that he chose to risk grounding his vessel, which he did, rather than risk a collision, but the collision happened. The Etoile carried a first officer and a pilot who steered as well. He was always on duty and on this occasion had come from Montreal and after landing passengers at Platon, had waited for tide to make other places. The speed of the vessel was about 9 miles an hour. The master stated that he guided himself entirely by the lights. He had a compass but it was not used. When told by the pilot that he saw a vessel coming, he saw a green light on his starboard side, and after seeing that, he saw three lights for one or two minutes, then the red, but when he saw the three lights he sounded two blasts signifying that he wanted to keep to the left of the channel, but never altered the helm. Then he received one blast and replied with two, rang "ease away," then "stop," then "reverse," and the collision occurred.

The pilot stated that he held a master's certificate since 1889, and was engaged on the Etoile as pilot and wheelman, and that he dealt entirely with the navigation of the vessel, but the master saw to the bells when making a landing. When the Hochelaga's red light was seen the master gave the order to starboard and kept the wheel hard to starboard until the collision occurred. He stated that there were three signals given with the whistle, they answering with two blasts, twice the signal of one blast of the Hochelaga. When the master gave him the order to starboard, he immedi-

ately relinquished all responsibility. Had he been left to his own devices, he stated that he did not know what line of conduct he would have followed. It was a matter of seconds between the order "full astern" and the collision, and at the moment of collision the wheel escaped from him and struck him on the arm, disabling him for 10 days.

In dealing with the Hochelaga, the court found that the actions of the vessel up to the hearing of the first two blast signal from the Etoile bore all the earmarks of proper navigation and seamanship, but instead of replying by one blast the proper action would have been to sound three blasts and put the engines full speed astern, in conjunction with a hard to port helm. These actions would have caused her to swing more rapidly to starboard, and the probabilities are that if there had been an impact, it would have been trifling, and the Hochelaga, had she grounded, would only have received minor damage, if any, and this would have met the requirements of article 23. The fact of not sounding three blasts when the full astern order was given did not contribute to the collision, as at that time it was inevitable. The collision was imminent at the first two blasts from the Etoile. The court commended the action of running the risk of grounding the vessel rather than colliding. The court therefore criticized and censured the master, Capt. W. G. Tudor, and the pilot, S. Perron, of the Hochelaga, for the error of judgment mentioned.

Regarding the Etoile, the court pointed out that the man at the wheel was engaged as a pilot, though he did not hold a license as such, and although he held a master's certificate, it was issued many years ago. The pilot's evidence convinced the court that the master chose to order the Hochelaga to starboard his helm and pass green to green to him, while he was showing his red light to the Hochelaga. To make such a request under the conditions existing, so near a buoy and shoal water, was nothing short of criminal, and had it been performed by one versed in navigation methods and thoroughly conversant with the rules of the road, it would apply in a forcible manner, but the evidence shows that the master and the pilot of the Etoile showed great ignorance in these matters. The court therefore attributed the signal of two blasts as an absolute proof of ignorance of the rules of the road. Again, when the Hochelaga gave one blast in return, it was the imperative duty of the master of the Etoile to put his vessel full speed astern immediately, which he failed to do. The pilot, M. Chabot, who held a master's certificate for minor inland

waters, granted some 30 years ago, was still unable to tell the port or starboard sides of the vessel properly, and admitted that he only read the rules of the road after the collision. Such an admission from a master is, to say the least of it, astounding. His engagement was verbal, but was to the effect that he was to pilot and navigate, yet at the crucial moment, when danger was impending, he ceased to act, or advise, and attempted to free himself of the onus of the disaster by stating that the master took command. The court remarked on the method of keeping the lookout and disapproved of the lookout man being in the wheelhouse, and the practice of the lookout man helping with the wheel is to be condemned owing to the lengthy hours the man would be called upon to give to these duties. The letter and spirit of the rules of the road, which orders that a good lookout be kept, were not met in this case.

The right to navigate the St. Lawrence or any other waterway is not given to large vessels, or counsel for the Etoile rightly remarked, when he claimed privileges for local traffic, and the court replied that since that privilege is given it must be with the understanding that those engaged in such traffic must possess the requisite knowledge to command and operate the vessels plying in these waters, similarly, but proportionately, to those commanding large and foreign going vessels. That there was no loss of life was providential, and not due to any knowledge of navigation or rules of the road on the part of the master, Capt. J. D. Boisvert, and the court found that the master, and the pilot, M. Chabot, invited the collision by deliberately violating articles 19, 21, 23, 25 and 29 of the Rules of the Road, and it decided that it must see that a repetition will be impossible and it will allow Capt. J. D. Boisvert's presence on his vessel as owner, but not as master, and therefore cancels his certificate, 1407. Regarding the pilot the court is of opinion that he holds a master's certificate unworthily. It is true he was engaged verbally as a pilot, and as there was no agreement or articles signed by any of the crew, the court assumed that his duties were equivalent to a sailing master, and having that in view, cancelled his master's certificate. While the court censured the master and pilot of the Hochelaga, it sympathized with them for the distressing and nerve racking moments they were subjected to when meeting a situation forced upon them by the ignorance of some local navigators, and fortunately such utter disregard of the rules is rarely met. The court also expressed the opinion that it is established not only to find fault and penalize but also to make recommendations with a view to bettering the situation as it is found, and thus counsels that a positive assurance of the knowledge and ability of an applicant be obtained by strict methods before a certificate is given to him to permit of his mingling with others of the profession. Sec. 152, part III, cap. 113, R.S.C. 1906 obliges masters of all vessels above 80 tons to have the crew sign an agreement. The Etoile, which is of much greater tonnage, violated this section, as none of them signed an agreement in accordance with the act, therefore a prosecution against the owner or owners is obvious.

The International Mercantile Co.'s Receiver, was discharged at Trenton, N.J., Oct. 3, after it was shown that all claims against the organization had been withdrawn or paid.

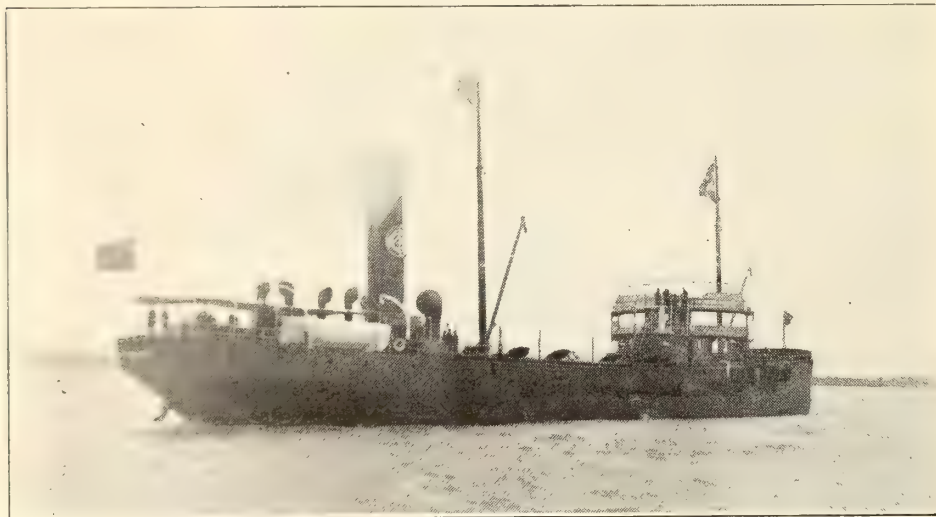
Five New Tank Steamships for Imperial Oil Co.

The Imperial Oil Co. is adding to its fleet five steel oil tank steamships for service on the Great Lakes during the summer and on the ocean during the winter when lake navigation is closed. The following are the dimensions of the first three, viz., s.s. Royalite, s.s. Iocolite and s.s. Sarnolite: Length overall 258 ft.; length b.p., 250 ft.; breadth, moulded, 43 ft.; depth, moulded to main deck, 18 ft.; gross tonnage, 2051.83; net register tonnage 1542.44; deadweight loaded, 2700 long tons; total capacity of oil cargo tanks, 124,500 cu. ft. The expansion trunk is 7½ ft. high and extends the full length of the oil tanks. Each vessel is divided into 10 main oil tanks, 4 lubricating oil tanks and a cross bunker for oil fuel. Side bunkers are fitted for carrying coal, the vessels being designed to work on either coal or oil fuel. The pump room, which is forward of the foremost tank, is equipped with two 18 x 14 x 24 in. duplex oil pumps for handling

stalled, including independent main feed large size general service and fire pump, sanitary and fresh water pumps, surface feed water heater, evaporator and distiller.

The steam steering gear is on the main deck aft and connected directly to a fixed quadrant. The steam windlass is of the patent direct grip type with warping ends. Each vessel has two pole masts with one derrick on each for handling suction hose pipes. Three 6 x 8 single drum winches are carried for mooring purposes and to operate the derricks, 2 on the main deck forward, 1 port, and 1 starboard, and 1 on the poop deck.

Quarters for the captain, the Marconi wireless operator and the wireless instruments, are provided in a house on top of expansion tank. The engineers are housed in the poop, and accommodation for the 1st and 2nd mates, petty officers and seamen is provided in the forecabin. A very complete system of



Imperial Oil Co.'s s.s. Sarnolite.

the cargo quickly and so arranged that either pump can pump out any tank, whether on the port or starboard side; the control valves being operated from the top of the expansion trunk. A steam driven fan is also located in the pump room for the purpose of drawing the foul gases from the various cargo tanks and pump room, or blowing fresh air in as desired. Nos. 1 and 2 tanks have been arranged for carrying gasoline, and a cofferdam has been fitted aft of these so as to separate them from the other oil tanks. Another cofferdam is fitted between the oil fuel bunker and the oil tanks. A small cargo hold is fitted between the fore peak bulkhead and the pump room and will be used occasionally for carrying case oil. The main oil suction is 8 in. diameter with 6 in. branches and are arranged so that the pumps can draw from any tank and discharge into any other. Provision has been made for the carriage of water ballast in the forward and after peaks and in the double bottom under engines and boilers.

The propelling machinery consists of a set of surface condensing engines 16, 26 and 44 x 36 in. stroke, with direct connected air pump and 2 bilge pumps. Steam is supplied by one Scotch boiler 15 ft. diam. x 11 ft. long, working at 180 lbs. pressure under natural draught. A complete set of auxiliaries has been in-

stalled, including independent main feed

electric lighting has been installed. Generally speaking, the vessels are of the most up to date character for carrying oil in bulk and everything has been done to ensure that the equipment and workmanship is of the best character.

The Royalite's trials were run on a measured mile course outside of Collingwood harbor on June 14. The principal results are shown below, the designed speed of 9 knots on 14 ft. draught being exceeded.

Boiler pressure	180 lbs.	175 lbs.
Revolutions per minute.	78.8	87
Total i.h.p.	678	937
Speed	9.183 knots	9.863 knots
Draught forward and aft	14 ft.	14 ft.
Admiralty	$D^2 \div s + S^3$	
Coefficient	255	228
	I.H.P.	

The Iocolite ran trials on Sept. 15, with equally satisfactory results. The Sarnolite was launched on Sept. 27, and is expected to leave the lakes for the ocean late in November. The vessels have been built by the Collingwood Shipbuilding Co. under the supervision of Capt. R. W. Henderson, Commander, U.S. Navy, and now Marine Superintendent, Imperial Oil Co.

In addition to the above, work is about to be commenced at Collingwood on two more steamships for the Imperial Oil Co., viz., s.s. Torontolite and s.s. Tararalite. They will be somewhat larger than the first three described above, be-

ing 250 ft. long, 43 ft. 9 in. breadth, moulded, and 25 ft. depth moulded to main deck.

Regulations Respecting Collisions with Navy Vessels.

An order in council has been passed providing that if any vessel causes any injury by collision or otherwise to any ship belonging to or engaged in the service of His Majesty, or to any person on board such ship, or is so navigated or managed as to cause danger of collision, the master or person in charge of the vessel shall be guilty of an offence unless it is shown that such injury or danger of collision was not caused or contributed to by any failure on his part to keep or cause to be kept a proper lookout, or to observe any of the regulations for preventing collisions at sea, or any regulations relating to the navigating or mooring of ships in a harbor or the approaches thereto, or to take any precaution required by ordinary practice of seamen, or by the special circumstances of the case.

Also that if a seaman lawfully engaged in accordance with the Merchants Shipping Act, or the Canada Shipping Act, to serve on board any British ship belonging to or chartered or requisitioned by the Admiralty, neglects or refuses without reasonable cause to join his ship or to proceed to sea in his ship, or deserts or is absent without leave from his ship or from his duty at any time, or joins his ship in a state of drunkenness, so that the performance of his duties or the navigation of his ship is thereby impeded, he shall be guilty of an offence. The master, mate or owner of the ship, or his agent, or any naval or militia officer, or any superintendent, as defined by the Merchants Shipping Act or the Canada Shipping Act, may with or without the assistance of a police constable, convey on board his ship any seaman whom he has reason to believe to be guilty of an offence under this paragraph. Police constables and other peace officers shall render such assistance as may be required of them in arresting seamen and conveying them on board under the provisions of these regulations.

Any person violating any of the provisions of these regulations shall be liable upon summary conviction before two or more justices of the peace, to a fine not exceeding \$5,000, or to imprisonment for not exceeding five years, or to both fine and imprisonment.

The Borghild-Oriole Collision.

Judgment in the matter of the collision between the Norwegian s.s. Borghild and the U.S. fishing schooner Oriole, near the entrance to the Bay of Fundy, Aug. 12, when the schooner was sunk and four lives lost, was delivered at Halifax, N.S., recently, by Capt. L. A. Demers, Dominion Wreck Commissioner, with Commander Wyatt, R.N.R., and Capt. A. Cuthbert, nautical assessors, concurring. The court found the master and mate of the s.s. Borghild in default for violating article 16 of the Rules of the Road, and also found the master of the schooner Oriole equally at fault for carrying a press of canvas, violating the first paragraph of article 16 and therefore inviting a collision. As both vessels are of foreign register, the court had no jurisdiction over the officers' certificates.

The New Steamships Thorjerd and Blaamyra.

Two sister steel freight vessels are being built at Port Arthur, Ont., for unnamed owners. Their dimensions are: Length over all, 261 ft.; length between perpendiculars 251 ft.; breadth moulded 43 ft.; depth moulded 28 ft. 2 in.; carrying capacity about 3,000 gross tons.

They will be of the single deck type, with poop, bridge and forecastle, steel deckhouse on bridge deck and chart room on top of deckhouse, with navigating bridge. They are being built on the transverse system of construction. There will be two cargo holds with two hatches in each hold. No. 1 hold will extend from collision bulkhead to boiler room bulkhead and no. 2 hold from engine room bulkhead to after peak bulkhead. The propelling machinery will be located amidships. The double bottom will be 3 ft. deep and will extend from collision bulkhead to after peak bulkhead, divided by transverse water or oil tight floors into a number of compartments. Part of the double bottom will be utilized to carry fuel oil, the remainder of the fuel to be carried in wing tanks, which can also be used for coal. The officers and crew will be berthed amidships on bridge deck, where also will be the mess rooms, galley, pantry, lavatories, etc. The firemen and sailors will have their quarters aft on main deck.

The two main boilers will be of the Scotch marine type, single ended, and arranged abreast. They will be 14 ft. 8 in. diam. by 11 ft. long and will have a combined grate area of 126 sq. ft. Each boiler will have three corrugated furnaces, of the suspension type, 42 in. inside diam. They will be fitted for natural draft.

The propelling machinery will consist of triple expansion engine with surface condensers, built-in type, 3 cylinders each, working each on a separate crank placed at an angle of 120 degrees. The slide motion will be of the Stephenson link type. Cylinders 20, 33 and 54 in., with a stroke of 40 in. The average working horse power will be 1,200, maximum 1,300. The high pressure cylinder will have piston valve, the low and intermediate will have double ported slide valves with relief frames, and the low pressure one will have a Lovekin assistant cylinder. The high pressure cylinder will be supplied with a loose bushing of hard cast iron. All cylinders will have relief valves, top and bottom, discharging into the atmosphere. The turning gear will consist of a single cylinder engine, driving through worm gearing, a shaft mounted on sliding cast steel worm. The propeller will be of cast iron, solid section, with four blades. The air pump will be bolted to the back column of the engine.

The steam steering gear will be placed on the main deck in the engine room. There will also be a hand steering gear aft. There will be a 8 x 6 in. steam windlass fitted with hand attachment and friction brakes. All anchors will be of the stockless type, of size in accordance with Lloyd's requirements. To facilitate the handling of the cargo there will be six 7 x 12 in. reversible steam winches, and 6 derrick booms to lift 4 tons each.

The vessels will be fitted throughout with electric light. One 7½ k.w. generator will be fitted in engine room. All wires, with the exception of those in cabins, will be enclosed in conduit, with outlets terminating in watertight fix-

tures. In the cabins the wire will be run in wood mouldings.

The vessels are being built by the Western Dry Dock & Ship Building Co., Ltd., to take the highest class in Lloyd's Registry and under their special survey. The Thorjerd was launched Sept. 27, and the Blaamyra during October.

Stranding of the s.s. Matatua.

An investigation into the cause of the stranding of the Shaw, Savill and Albion Co.'s s.s. Matatua in St. Mary's Bay, Nfld., July 22, was held at Halifax, N.S., recently, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Commander E. Wyatt, R.N.R., and Lieutenant R. H. Wright, R.N.V.R., as nautical assessors. The evidence brought out that the master, Capt. Jas. MacFie, upon reaching St. John, N.B., to take command of the Matatua, after the death of her former master, was stricken with paralysis on the left side of his face, and acknowledged that he was not in a fit state to take command, but seeing he was on the spot, he did not want to give it up; a fire partially destroyed the vessel, a series of explosions occurred on board which had the effect of tearing her decks, bending frames and causing other injuries, and she sank, resting on the bottom of the dock in St. John with the falling and rising tides, her compasses, standard and steering were also injured. Upon leaving St. John an adjuster was called to adjust the compasses, but it is evident that none of the officers watched the operation. The vessel proceeded to Halifax, where she underwent some temporary repairs, new plates being put in and patches made here and there, all of which tended to disturb the induced and permanent magnetism of the vessel. Then the master discovered that the magnet for correcting the heeling error had not been placed, therefore the adjustment for that particular correction had not been installed, and consequently the compass was not adjusted. During her course from Fame Point, which was traced with the intention of passing between Cape North and St. Paul's Island, the master found after experiencing some hazy weather, that he passed to the north side of St. Paul's Island, which meant that the vessel had outrun her distance; then a course was traced for Sydney, N.S., which apparently was made good. He left Sydney, July 21, and when passing Flint Island a departure was made by a cross and four point bearing and the log was set. The vessel was kept on her course, and full speed was maintained during fog, until just before she grounded the next morning. The master was supplied with a new set of charts as well as sailing directions by his London office, but he never consulted them. He had sailed in these waters before but not on this particular route.

The court could not understand why a man of the ability of the master omitted to take elementary precautions in navigating his vessel. In view of the uncertainty which should have existed in his mind, the court thought it apparent that navigating his vessel through the Gulf of St. Lawrence until he reached the ocean demanded unusual caution on his part. Had he read his sailing directions he would have found that at a certain period of the year, in the Cabot Strait, the current has a trend northward, which is amply proved in the present case, and he would surely not have kept his vessel at full speed in a thick

fog, and without casting a lead. It is not permissible for a master to navigate his vessel in a fog for a number of hours without diminishing his speed if necessary to take soundings, and frequent soundings, to check his courses. He stated that he did not think it was necessary as he considered himself at sea and that the soundings were not reliable. The court contradicted this statement, as it was aware that vessels carrying passengers and coming to Canada, after making Cape Race, or entering Cabot Strait, are led entirely by the lead. Soundings, although irregular, if a chain of them be taken, will show without doubt the position of a vessel, and the existence of whatever elements there may be to influence the vessel outside the course presumed. It could not find any excuse for the master failing to take soundings, even though he was short of tubes for his sounding apparatus, because he had a deep sea lead, and could use it as was done before sounding machines were invented. So far as the evidence went the court was of opinion that the necessary means were adopted to free the vessel after she grounded. The condemnation by the court is based purely on the action of the master in not acting in a prudent and careful manner. In fact, without hesitation, the court stated that the vessel was carelessly navigated in view of the possible conditions existing, and it was of the opinion that from the outset, the master was not in a fit condition to assume the grave responsibility which devolved upon him. The duty of the court would not be complete and its existence would not be justified if it did not condemn the master for faulty navigation, and therefore, though it had a great deal of sympathy with him in his affliction, as he accepted the responsibility, the court suspended his certificate for three months from Sept. 15 to Dec. 15.

Discontinuance of Lights and Fog Alarms for the Winter.

All Canadian light and fog alarms on the St. Lawrence River above Montreal, Lakes Ontario, Erie, St. Clair, Huron, Georgian Bay, Lake Superior and connecting waters, will be maintained in operation until the morning of Dec. 25, excepting the southeast shoal lightship, Lake Erie, which may be forced to abandon her station by ice conditions before the general close of navigation, and also at Lonely Island, Georgian Bay, from which the keeper may be removed before the close of navigation, also certain stations on Lake Superior, viz., Slate Islands, Battle Island, Lamb Island, Shaganash, Point Porphyry, Thunder Cape, Welcome Islands, Pie Island and Victoria Island, which will close after the last sailings to or from Port Arthur and Fort William. All gas buoys and other floating aids to navigation will be maintained in position as long as ice conditions will permit, and in cases where it is necessary to remove gas buoys before the close of navigation the more important ones will be replaced by spars. Light keepers are cautioned to maintain their stations in operation until the time mentioned above, viz., the morning of Dec. 25.

Norman A. Rule, Treasurer, Standard Shipping Co. Ltd., Winnipeg, writes: "I feel that the regular receipt of the Canadian Railway and Marine World is instructive to all of us."

Atlantic and Pacific Ocean Marine.

What is said to have been the most valuable cargo of raw silk ever landed on this continent was discharged at Vancouver recently from the C.P.R.'s s.s. Empress of Russia. It was valued at about \$3,500,000.

The Matsuo Co., of Seattle, Wash., and Kobe, Japan, is reported to have placed an order for the building of four steel steamships of 8,800 tons each, costing approximately \$1,000,000, with the Wallace Shipyards, Ltd., Vancouver.

The Belgian Government is financing a new steamship service to be operated between Havre, France and U.S. ports. The company will have a nominal capital of 100,000,000 francs, which will be guaranteed as to principal and interest by the Belgian Government.

The s.s. Arabien, owned by the Danish East Asiatic Co., Copenhagen, and under charter to Canadian Pacific Ocean Services, Ltd., for operation between Vancouver and Vladivostok, was docked at Esquimalt during October for overhaul and repairs.

The Cunard Line announces that two of its steamships, the Feltria and Folia, formerly owned by Canadian Northern Steamships, Ltd., will call at Halifax, N.S., during the winter, both eastbound and westbound, on the regular route between Bristol and U.S. ports.

The Ulster Steamship Co., operating the Head Line between Great Britain and Canada, is claiming \$25,000 in the Montreal Admiralty Court, for services rendered in salving the s.s. Fremona, which grounded on Anticosti Island, Aug. 1.

Canadian Robert Dollar Ltd., has been incorporated under the British Columbia Companies Act, with \$40,000 capital and office at Vancouver, with power among other things, to own and operate steam and other vessels for the transportation of mails, merchandise and passengers.

Manchester Liners, Ltd., has added three vessels to its fleet, one for each of the services to Canada, Philadelphia and Baltimore. The company now owns 17 vessels, aggregating 125,316 tons dead-weight capacity, operating directly to and from Manchester, Eng., via the Manchester Ship Canal.

The repairs on the Japanese s.s. Kenkon Maru 3, which stranded on the Belle Chain reef on Jan. 12, have been completed at Portland, Ore., and she resumed her service in October. The cost of the

repairs was \$175,000, and the work took 42 days. The vessel is about 20 years old and was formerly the British s.s. Ailsa Craig.

The Japanese s.s. Shintsu Maru, which ran ashore about four miles south of the Sandheads buoy at the mouth of the Fraser River, Sept. 22, was released Sept. 29, after practically all of her cargo had been lightered. She was docked at Vancouver, and it was stated that neither the vessel nor her cargo had been injured and that there was no damage to be repaired.

The Hudson's Bay Co. is reported to have purchased the s.s. Sacramento from the Northern and Southern Steamship Co., of San Francisco, Cal. The Sacramento was formerly the s.s. Alexandria, and was owned by the Kosmos Line. It is stated that the vessel has been detained at Valparaiso since the commencement of the war. The price paid is given as \$800,000.

P. A. Franklin, Vice President, International Mercantile Marine Co., is reported to have stated recently that the war has developed the necessity for a line of fast steamships in the trans-Atlantic service, and that the company is ready to build four 25 knot quadruple turbine steamships of from 32,000 to 35,000 tons each. Two of these, it is said, will be ordered in the U.S., and two in Belfast, Ireland.

The Cunard Line s.s. Alaunia, which was sunk by a floating mine in the English Channel, Oct. 19, was built at Greenock, Scotland, in 1913, for the Canadian service, and was launched June 7, 1913, her sister vessel, the Andania, having been launched in Mar., 1913. She was 540 ft. long, 64 ft. broad and 46 ft. deep, and equipped with two sets of quadruple expansion engines and complete up to date equipment for the accommodation of 2,140 passengers, two classes only. It is reported that two of her crew lost their lives.

The C.P.R. is reported to have purchased the s.s. Hackness from Pyman Bros., Ltd., of Wales. The s.s. Hackness was built in 1914, and is of the shelter deck type, 4,928 tons gross, 2,954 tons register. She was formerly owned by the London & Northern Steamship Co., owning 16 vessels with a combined carrying capacity of 92,000 tons, all of which have been acquired recently by Pyman, Watson & Co., Ltd., South Wales, for about £2,000,000. The s.s. Hackness has been under charter to the C.P.R. for several months for its Atlantic service.

The Anchor Line, in which the Cunard

Co. has practically a controlling interest, has absorbed the Donaldson Line, and the two companies will be operated under one management as the Anchor-Donaldson Line, with Sir Alfred Booth, Chairman, Cunard Co., as Chairman. The Donaldson Line has been operating between Glasgow and Canada for several years, and uses the steamships Athenia, Cassandra, Letitia and Saturnia on that service. In addition to this a regular service is run to the River Plate. The Anchor Line operates in the passenger trade between Glasgow and New York.

It is announced in Montreal that the Marine Navigation Co., a French company, has arranged for regular sailings from Canadian ports, Montreal in summer and Halifax in winter, to St. Nazaire, France. It is stated that the first vessel to sail early in November will be the Nigaristan, and that she will be followed about two weeks later by the North Cambria. These two vessels will make regular monthly trips, and will be supplemented by others if the necessity arises. The company is reported to have purchased a number of sailing ships from Aberdeen, Scotland, recently, for the Canadian lumber and coasting trade.

During the visit of the Minister of Customs to Vancouver recently he was again urged to consider the appointment of a Canadian customs officer at New York to facilitate the handling of freight in bond originating in Eastern Canada and destined for British Columbia ports, via the Panama Canal. It was suggested that a solution of this difficulty might be made with the inauguration of a new steamship line from Montreal in the summer and Halifax or St. John in the winter, or by an extension of the present line now running to and from New York. An Ottawa press dispatch of Oct 14 stated that for the present at least the Minister has refused the request.

The C.P.R. is going to overhaul its trans-Pacific steamships at the beginning of the New Year. They will be laid up at Hong Kong for renovation and repair. The s.s. Empress of Asia will be taken in hand first, on her arrival there about Jan. 17, and she will be out of service for about a month. She will be followed in turn by the steamships Empress of Russia and Empress of Japan, the first being out of service for a month and the latter for 26 days. The Empress of Asia and Empress of Russia have not been completely overhauled since they were released from Admiralty service about a year ago. The s.s. Monteagle was overhauled at Hong Kong recently.

List of Steam Vessels Registered in Canada During September, 1916.

No.	Name	Port of Registry	Where and When Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
134469	Clincher.....	Halifax, N.S.	Camden, N.J.	1892	132 6	25 4	16 0	368	66	81 sc..	Canadian Salvage Association Ltd., Montreal
134665	Fort McMurray	Winnipeg.....	McMurray, Alta.	1915	151 0	28 3	4 5	661	397	9 sc..	Hudsons Bay Co., London, Eng.
134470	M. Moran.....	Halifax, N.S.	Camden, N.J.	1912	109 0	25 7	14 5	315	111	54 sc..	Canadian Salvage Association Ltd., Montreal
134468	Petrel.....		Port Richmond, N.Y.	1915	123 7	26 3	15 3	540	367	65 sc..	
134270	Schoolcraft.....	Midland, Ont.	Trenton, Mich.	1884	185 0	34 0	14 2	972	690	80 sc..	Manley Chew, Midland, Ont.

List of Sailing Vessels and Barges Registered in Canada During September, 1916.

No	Name	Port of Registry	Rig	Where and When Built	Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner	
133895	Ada Tower	Parrsboro, N.S.	Schr.	Port Grenville, N.S.	1916	175 5	36 4	12 9	528	G. M. Cochrane, M.O., Fox River, N.S.
138229	Agnes Wilson	Montreal	Barge	Charlamange, Que.	1916	126 0	27 3	7 8	225	St. Maurice Paper Co., Montreal
138191	James Slater	Liverpool, N.S.	Schr.	Port Jefferson, N.Y.	1874	114 9	28 9	9 9	282	Publicover Shipping Co., Dublin Shore, N.S.
138256	Marian J. Smith	Lunenburg, N.S.		Liverpool, N.S.	1916	128 2	33 8	11 4	332	W. C. Smith, M.O., Lunenburg, N.S.

NOVEMBER, 1916.]

Maritime Provinces and Newfoundland.

The hull of the s.s. Senlac, which was damaged by fire at Sydney, N.S., recently, is reported to have been sold to C. Brister and Son.

The Imperial Oil Co. has deposited with the Public Works Department at Ottawa, plans and description of site for a wharf to be built at Halifax, in the harbor in front of lands adjoining Fort Clarence southward of the eastern side of the harbor.

The French Cable Co.'s cable repair steamship Contre-Amiral Caubert was purchased recently by W. N. McDonald, Sydney, N.S., the stated price being \$102,000, and after being renamed Vigo, was sold to New York parties. She was built at Havre, France, in 1875, and is 2,078 tons gross, 1,137 register.

It is reported that the steam tug Amelia, which plies between Pictou, N.S., and Prince Edward Island, has received \$100,000 as salvage for towing the Belgian s.s. Indutiomare, which had been abandoned as a total loss near Magdalen Islands, into Halifax. The value of the cargo is given as \$200,000.

With reference to the report mentioned in our last issue, that the Dominion Government had purchased the Central Vermont Transportation Co.'s steamships Manhattan and Narragansett, for \$1,000,000, we have been officially advised that it is incorrect, and that there have been no negotiations regarding such purchase. In commenting on the report, we stated that it should not be taken seriously.

The St. Lawrence Timber, Pulp and Steamship Co., Ltd., has been registered in London, Eng., recently with £103,000 capital, to acquire and develop timber estates in Newfoundland, and to carry on the businesses of shipowners and builders, shipwrights, ship and insurance brokers, managers of shipping property, etc. An agreement is in contemplation to purchase from M. Deacon certain rights at Bonne Island, Nfld.

The Eastern Steamship Co.'s s.s. Calvin Austin, which has been on the St. John, N.B., and Boston route for some time has been transferred to the Boston-Portland route, and her place has been taken by the s.s. North Star, formerly on the Portland-New York route. During the winter the North Star will be the only vessel of the company on the St. John and Boston route, the s.s. Governor Cobb being transferred to the winter service between Key West and Havana.

The St. Mary's Bay Steamship Co.'s s.s. Mikado struck a ledge on the eastern side of Petite Passage, near Digby, N.S., at the end of September and subsequently became a total loss. The cargo of mixed freight for Weymouth and St. Mary's Bay ports, was salvaged. She was built at Shelburne, N.S., in 1896, and was screw driven by engine of 16 n.h.p. Her dimensions were: Length 82 ft., breadth 18 ft., depth 7.7 ft., tonnage 80 gross, 49 register. She was formerly known as Westport.

The St. Peter Canal, on the south coast of Cape Breton Island, N.S., is partially closed to navigation, and vessels drawing more than 16 ft. cannot pass through. At present vessels drawing not more than 16 ft. can pass between half tide flood and half tide ebb, and it is expected that in a short time they will be able to pass through the canal at any stage of the tide. The certificate of registration of the

Oruro Steamship Co., Ltd, has been revoked by the Nova Scotia Registrar of Joint Stock Companies, owing to non-payment of annual registration fees.

The St. John, N.B. Board of Trade passed a resolution, Oct. 13, and sent a copy to the Dominion Government, urging the use of Canadian ports as a solution of the difficulties arising from the recent submarine raid on vessels off the U.S. coast. It was pointed out that trade with Canadian ports is protected by the British Navy, and that any submarine menace that might arise could be dealt with more effectually and without international complication. It was requested that all goods intended for Great Britain be routed through Canadian ports.

The ferry service between New Brunswick and Prince Edward Island is being performed by the s.s. Northumberland and the car ferry steamship Prince Edward Island. The Northumberland is operated by Canadian Government Railways between Point du Chene, N.B., and Summerside, P.E.I., making one round trip daily except Sunday; and the car ferry steamship Prince Edward Island runs between Pictou, N.S., and Charlottetown, P.E.I., making one round trip daily except Sunday. No decision has been arrived at as to the time of writing as to the winter service, as it was an open question whether the approaches at Cape Tormentine and Cape Traverse will be ready for a winter car ferry service.

Province of Quebec Marine.

It is reported that orders have been placed with Canadian Vickers, Ltd., Montreal, for the construction of two steamships, each of 7,000 tons capacity.

The Public Works Department has completed dredging in front of Les Eboulements wharf at Cap Joseph, to a depth of 15 ft. below low water level. The area dredged is from 183 ft. eastward of the southwest corner of the wharf to 247 ft. westward of same.

The icebreaking steamship J. D. Hazen, which was recently built by Canadian Vickers, Ltd., at Montreal, for ice service in the St. Lawrence River, and which was sold to the Russian Government imme-

diately after being completed, has been somewhat overhauled to meet the wishes of her new owners, and has been renamed Mikula Selianovitch. She underwent a series of trials at Murray Bay, Oct. 23, and will probably sail for Europe at any time.

The Davie Shipbuilding and Repairing Co., Levis, has been awarded the contract for the overhauling of the nine steamships which the French Government purchased recently from the Great Lakes and St. Lawrence Transportation Co., after which, they will proceed to Europe. An injunction was obtained recently in Chicago, restraining the sale, but as the vessels were then in Montreal, and the sale apparently made, nothing could be done in the way of holding them.

During the convention of the American Association of Port Authorities at Montreal recently, the delegates paid a visit to Quebec, where they were entertained to luncheon by the Harbor Commission, being welcomed by D. O. L'Esperance, Chairman, the Mayor and J. G. Scott, President of the Board of Trade. They were taken over the various harbor works in progress, and had an opportunity of seeing the full advantages offered at the port, including the unloading and loading of lake steamships and ocean steamships, both freight and passenger. One of the ocean steamships to load at the elevator was the Arachne, which had just come out of the local dock after having been repaired and overhauled subsequent to being wrecked on Anticosti Island.

Ontario and the Great Lakes.

The Dominion Government hydrographic steamship La Canadienne, which ran ashore at Dorion, Lake Superior, Sept. 17, was released about a week later and taken to Port Arthur for examination and repair.

The Canada Atlantic Transit Co. held its annual meeting at Ottawa, Sept. 26, when the following board of directors was elected for the current year,—E. J. Chamberlin, President; H. G. Kelley, Vice President; Frank Scott, Secretary and Treasurer; J. E. Dalrymple and H. R. Safford.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during September, 1916.

ARTICLES	CANADIAN CANAL	U. S. CANAL	TOTAL
Copper.....Eastbound	Short tons 946		18,960
Grain....."....."	5,423,807	18,014	9,225,916
Building stone....."	Short tons 475,791	1,200,530	1,676,321
Flour....."	Barrels 1,765,936	7,765,779	9,531,715
Iron ore....."	Short tons 10,277		10,277
Pig iron....."	M. ft. b.m. 2,980	53,054	56,034
Lumber....."	7,951,637	7,279,026	15,230,663
Wheat....."	Bushels 4,040	53,348	57,388
General merchandise....."	Short tons 2,321	1,003	3,324
Passengers....."	Number		
Coal, hard.....Westbound	Short tons 12,800	291,087	303,887
Coal, soft....."	143,865	1,728,213	1,872,078
Flour....."	Barrels 45		45
Grain....."	Bushels 950		950
Manufactured iron....."	Short tons 5,255	14,533	19,788
Iron ore....."	Short tons 3,500	103,534	107,034
Salt....."	Barrels 47,996	122,801	170,797
General merchandise....."	Short tons 2,089	833	2,922
Passengers....."	Number		
SUMMARY			
Vessel passages.....	Number 918	2,521	3,439
Registered tonnage.....	Net 1,801,952	7,993,765	9,795,717
Freight Eastbound.....	Short tons 2,165,783	8,358,140	10,523,923
Westbound.....	210,416	2,172,185	2,382,601
Total freight.....	2,376,199	10,530,325	12,906,524

The Great Lakes Transportation Co.'s s.s. Howard M. Hanna, Jr., when down-bound from Duluth, Minn., with ore, Oct. 13, got out of her course after passing through the canal at Sault Ste. Marie, and ran on the rocks just east of the lighthouse above the entrance to the new cut in the St. Mary's River. Part of her cargo was lightered and she was refloated with comparatively little damage Oct. 15.

The s.s. Roberval, owned by Hall and Eligh, Ltd., Ottawa, Ont., foundered in Lake Ontario, about nine miles from Oswego, N.Y., Sept. 26. Some of the crew were only rescued after having been adrift in an open boat without food for 20 hours. The Roberval was built at Toronto in 1907, her dimensions being, length 128 ft., breadth 24 ft., depth, 9 ft.; tonnage, 344 gross, 157 register. She was equipped with an engine of 27 n.h.p. driving a screw.

The steamships Rideau King and Rideau Queen, formerly owned by the Rideau Lakes Navigation Co., Kingston, but which have not been operated for over a year, were taken to Belleville recently for sale. The Rideau Queen is reported to have been sold to the Trent Navigation Co., for \$5,800. She was built at Kingston in 1900, and is screw driven by engine of 25 n.h.p., and her dimensions are, length 108 ft., breadth 27.3 ft., depth 6.9 ft.; tonnage, 251 gross, 196 register.

The Public Works Department has dredged the northerly 450 ft. of the dredged channel in Thunder Bay leading to the Mission Channel, to a depth of 25 ft. below zero of the harbor gauge, which is 601.86 ft. above mean tide level at New York. An additional width of 100 ft., with a least depth of 21 ft., is available bordering the deep channel on its south side or between it and the Mission Channel revetment wall. Adjacent to the wall the water varies from 15 to 25 ft.

The Montreal Transportation Co.'s s.s. Simla, while en route from Erie, Pa., to Montreal, with coal, struck a reef at Coronation Island, near Brockville, Oct. 3, during a fog, and foundered. She was built at Garden Island, Ont., in 1903, and was of oak, and of the following dimensions,—length 225½ ft., breadth 34 ft. 8 in., depth 15 ft.; tonnage, 1,196 gross, 730 register. She was equipped with triple expansion engines with cylinders 17, 28 and 46 in. diam., and supplied with steam by 2 Scotch boilers 11 by 11¼ ft., at 176 lbs.

The Imperial Oil Co.'s s.s. Sarnolite was launched at Collingwood, Sept. 27, thus completing the three vessels ordered to be built there, as mentioned in previous issues. The three are named Royalite, Iocolite and Sarnolite. They are built of steel for service on the Great Lakes and the ocean. They are of the following dimensions,—length over all, 258 ft.; length between perpendiculars, 250 ft.; breadth moulded, 43 ft.; depth moulded to main deck, 18 ft.; tonnage, 2,052 gross, 1,543 register; deadweight loaded, 2,700 tons (long); total capacity of oil cargo tanks, 124,500 cu. ft. The vessels are designed for a speed of 9 knots an hour on 14 ft. draught.

The name of the s.s. St. Joseph, which has been purchased in the U.S., by The Cleveland-Sarnia Saw Mills Co., Ltd., Sarnia, Ont., has had her name changed to Frank B. Stevens. She is of oak, and was built at Buffalo, N.Y., in 1867, and rebuilt in 1887. Her dimensions are, length 146 ft., breadth 29 ft., depth 11 ft.; tonnage, 304 gross, 171 register. She is equipped with compound engine with cyl-

inders 18 and 33 in. diam. by 28 in. stroke, supplied with steam by a Scotch boiler 9 ft. 10 in. by 11 ft. 4 in. The American Transit Co. has been incorporated to operate the vessel between Canadian and U.S. ports. The company was incorporated under the Dominion Companies Act with \$50,000 capital, and office at Sarnia. The officers are: E. C. Barre, Sarnia, President; A. I. McKinley, Sarnia, Vice President, and F. H. Rose, Cleveland, Secretary-Treasurer.

The s.s. Merida, owned by the Valley Camp Coal Co., Midland, Ont., with which Jas. Playfair, President and Managing Director, Great Lakes Transportation Co., is intimately associated, was lost with all hands, on Lake Erie, about Oct. 20, during a severe storm. She was built at West Bay City, Mich., in 1892, and was of steel with double bottom for watertight ballast, with 5 watertight bulkheads, steel boiler house, steam pump wells, etc. She was practically rebuilt in 1904, and was formerly owned by D. Sullivan & Co., Chicago, Ill. She was equipped with triple expansion engines with cylinders 23, 37 and 60 in. diam. by 44 in. stroke, 1,700 i.h.p., and 78 r.p.m., and supplied with steam by 3 Scotch boilers, 12½ by 12 ft., at 168 lbs. Her dimensions were, length 360 ft., breadth 45 ft., depth 26 ft.; tonnage, 3,329 gross, 2,389 register. She was purchased about a year ago by Jas. Playfair on behalf of the Valley Camp Coal Co., and has since been operated regularly on the Upper Lakes. She is valued at about \$200,000.

British Columbia and Pacific Coast.

The Melmore Steamship Co., Ltd., Vancouver, is being voluntarily wound up, with Buttar & Chiene as liquidators.

The Dominion Government lighthouse and buoy tender Quadra, which was sunk at the entrance to Nanaimo harbor, Feb. 26, after a collision with the s.s. Charmer, and was afterwards sold to the Vancouver Dredging and Salvage Co., and raised, is reported sold to eastern U.S. interests, for transfer to the Atlantic coast at an early date.

The second of the two car floats which the Canadian Northern Ry. is having built at Port Mann for conveying freight cars across Patricia Bay, was launched early in October. It is anticipated that the service will be in operation early in November. The floats will be towed across the bay by tugs which have been acquired and which are named Chilliwack and Sumas.

The Pacific Coast Steamship Co., and the Pacific Alaska Navigation Co., Seattle, Wash., have amalgamated, under the name of the Pacific Steamship Co. The first named company owns 13 passenger and freight vessels, and the latter 9 vessels. The value placed on them is about \$12,000,000. The amalgamation agreement takes effect Nov. 1. The principal officers are, H. F. Alexander, President; E. C. Ward, Vice President; W. Jones, Treasurer; E. B. Rogers, Secretary; and A. F. Haines, Manager.

M. P. Cotton, of Vancouver, who is head of the company which has been negotiating with the Grand Trunk Pacific Ry. for the lease of its drydock at Prince Rupert, returned to Vancouver recently after a series of interviews with E. J. Chamberlin, President, G.T.P.R., and members of the Dominion Government on the matter. Mr. Chamberlin had stated that he would not lease the dock without the Govern-

ment's consent, and the Premier had written him to the effect that "pending the investigations of the railway commission, it would be unwise to lease this plant at the present time." This he considered final, and all negotiations would be discontinued.

The Turbinia-Primrose Collision.

The Dominion Wreck Commissioner, Capt. L. A. Demers, delivered judgment, Oct. 20, re the collision between Canada Steamship Lines' s.s. Turbinia and the Toronto Ferry Co.'s s.s. Primrose, in Toronto Bay, Aug. 13. The enquiry was held at Toronto, Sept. 6, and the judgment was concurred in by Capt. J. B. Foote and Jas. McMaugh, who acted as nautical assessors. Following is a summary. The court is of opinion that the master of the Turbinia, in skirting the wharves to reach his coal pier, was aware that the vessel he saw was an Island ferry carrying an undetermined number of passengers. After sounding his danger signal and one blast and receiving no reply, he should have stopped his vessel, but chose to proceed on his way. By so doing, when at a couple of ship's lengths from the ferry and noticing no alteration in her course, he acted contrary to article 22, Lake Rules. He knew where the ferry was bound to, but apparently because he had, according to the rules, a right of way, he chose to proceed regardless of probable consequences, evidently forgetting to take into consideration the last paragraph of article 30, as well as article 22. The court cannot imagine how a master in a position of such responsibility as caretaker of property of such value as a ship represents, and having under his care the lives of men composing his crew, on a bright clear night, should attempt to cross the bow of a vessel which he knew to be carrying passengers, and within 30 or 40 ft. of her landing place, in order to save a few minutes of time. Fortunately there was no loss of life, as had there been, the court would have been justified in calling upon other courts to deal with the matter.

It finds the master of the Turbinia, Capt. B. W. Bongard, in default, first, when his one blast whistle was unanswered, it was his duty to stop the ship and await developments; second, there was no lookout ordered, though this was not conducive to the collision. The master has already been the subject of an investigation in a similar case, and his certificate was suspended for a certain period. The court realizes that there have been too many of these foolhardy methods adopted in the past, and that precautionary measures must be adopted before any calamity such as loss of life occurs, and as a deterrent to anyone who would feel inclined to run such risks. Though no lives were lost, it was certainly not through any proper seamanship exercised by the master. The court therefore would not be fulfilling its duty if it did not suspend his certificate 6047, for one year from date, and recommends that a mate's certificate for a passenger steamship be granted in the interim.

The master of the ferry steamboat Primrose, Capt. Alex. Brown, has also been the subject of investigation on two occasions, on one of which his certificate was suspended. His entire thought was centred on making the dock and maintaining his schedule. There was no lookout, and to a certain extent this contributed to the collision. In the absence of

local rules, the Rule of the Road prevails, and the master showed a lack of interest when he stated that he was unaware of any changes being made in the rules last February. The court maintains that it is every master's and officer's duty to be conversant with any alterations in laws governing shipping, and especially with rules of the road. Therefore the master failed, and wilfully, in observing the elementary rules which tend to safety, by maintaining his course, violating article 30, and keeping the same speed until the collision occurred. Articles 35, 37, and 38 were also flagrantly violated. For the reasons above given, it is abundantly proved that Capt. Alex. Brown lacks the judgment which is expected from the master of a vessel, and by his actions he has proved himself incompetent as a master, therefore the court cancels his master's certificate, No. 1940, but recommends that a certificate as mate of a freight steamship be granted to him.

The court calls the attention of the Marine Department to the evidence of the mate of the s.s. Primrose, who instead of keeping a lookout, was engaging in conversation with passengers somewhere away from the bow, and who stated that he held a permit to navigate for this year, given him by a member of Parliament in the form of a letter, and that years ago he held a tug master's certificate, but lost it and never applied for a renewal. It also pointed out that there appears to have been a flagrant violation of sec. 97 of the Canada Shipping Act, on the part of the Toronto Ferry Co., in the s.s. Primrose not having a properly certificated mate, as she is licensed to carry 900 passengers.

Mainly About Marine People.

J. W. Norcross, Vice President and Managing Director, Canada Steamship Lines, Ltd., left Montreal, Oct. 21, for England, expecting to return towards the end of December.

Robert Fraser, Marine Superintendent, Montreal Transportation Co., Kingston, Ont., is reported to have resigned his position and to have gone to California, where he will reside in future.

J. W. Greiner, whose appointment as Mechanical Superintendent, Canada Steamship Lines, Ltd., was announced in our last issue, was formerly Fleet Engineer, Canada Atlantic Transit Co.

A. Rutledge, heretofore General Superintendent, Dining and Parlor Cars and News Service, Eastern Lines, C.P.R., Montreal, has been appointed Purchasing Agent, Canadian Pacific Ocean Services, Ltd., Vancouver, B.C.

Major W. G. Hagarty, B. Battery, Royal Canadian Horse Artillery, C.E.F., son of J. H. G. Hagarty, of the St. Lawrence and Chicago Steam Navigation Co., has been awarded the D.S.O. for conspicuous bravery at the front.

H. A. Sanderson, heretofore President, and **P. A. S. Franklin**, heretofore Vice President, International Mercantile Marine Co., have been elected Chairman of the Board, and President, respectively, for the current year.

Sir William B. Bowring, head of the firm of Ct. T. Bowring & Co., London, Liverpool and New York, died at Liverpool, Eng., Oct. 22. He was born at St. John's, Nfld., in 1837, and was a director of Bowring Bros., Ltd., shipowners and importers, St. John's.

Capt. James Ewart, who died at Toronto, Oct. 5, aged 68, was associated with the lakes marine since boyhood, and for some years was senior captain of the St. Lawrence & Chicago Steam Navigation Co., but retired from active service about seven years ago. His last command was the s.s. E. B. Osler, previous to which he was master of the s.s. W. D. Matthews.

Capt. William English, who died at Victoria, B.C., recently, following an operation, was a native of North Sydney, N.S., and had been connected with seafaring from an early age. He went to the Pacific Coast in 1888, in a sealing schooner, by way of Cape Horn, and engaged in sealing there for a number of years. He subsequently served the Dominion Government on the fishery cruiser Galiano, the dredge tender Princess, the lighthouse tender Quadra, and was from 1910 to 1912 in Grand Trunk Pacific Coast Steamship Co.'s service on the s.s. Prince Rupert, and the tug Escort No. 2. On the outbreak of war, he returned to Government service and was second officer on the s.s. Galiano.

Norman A. Rule, whose appointment as Treasurer, Standard Shipping Co., Winnipeg, was announced in our last issue, was born at Collingwood, Ont., Apr. 3, 1877, and entered transportation service Mar. 1, 1892, since when he has been, to Apr., 1896, office boy, Great Northern Transit Co., Collingwood, Ont.; May, 1896, to May, 1904, purser Northern Navigation Co.; May, 1904, to May, 1912, Chief Accountant, same company, Collingwood; May, 1912, to May, 1914, Superintendent, Georgian Bay Division, same company; May, 1914, to Apr., 1915, Travelling Freight Auditor, Canada Steamship Lines, Ltd., Montreal; Apr., 1915, to Sept., 1916, Assistant to Operating Manager, same company, Toronto.

Rumored Increases of Shipbuilding Plants for Canada.—A press dispatch dated London, Eng., Sept. 29, stated that Vickers, Ltd., contemplated considerable expansion in Canada, and there was linked with the name of that firm, that of Yarrows, Ltd., of Glasgow, which already has a plant at Esquimalt, B.C. The dispatch also named Sir W. G. Armstrong, Whitworth and Co., Cammel, Laird and Co., and John Brown and Co., as being on the point of laying plans for shipbuilding in Canada. Several years ago, when the question was under discussion as to whether the Dominion Government should or should not start the building of naval vessels in Canada, the firms named above, in addition to at least one other firm, considered the question of opening plants in the Dominion, but when it was decided that the Government would not build the vessels, nothing more was heard of the other proposals until the establishment of a Vickers plant at Montreal, by Canadian Vickers, Ltd. Since then, these rumors have arisen at stated periods, the same names being mentioned and in the same terms, so that one might almost think that the item was kept on hand in various newspaper offices for use when required. N. Yarrow, Manager, Yarrows, Ltd., Esquimalt, stated recently that he knew nothing of such reports, and so far as he knew any development contemplated by Yarrows, Ltd., would be independent of other concerns, and in his opinion it was highly improbable that any great expansion of the nature indicated would be inaugurated during the course of the war.

Canada Steamship Lines Notes.

The company is preparing a roll of honor containing the names of employees who have enlisted for active military service.

It is stated that the earnings of the s.s. J. H. G. Hagarty, for this season, will more than equal her construction cost. Up to the commencement of October she had carried down 14 cargoes of grain, and had also carried 12 cargoes of coal between Lake Erie ports and Fort William.

A statement issued from the company's office in London, England, announced toward the end of September, that for the first time since the outbreak of war, passenger traffic had become normal, and that business in the passenger department, for the period to the end of August, showed a net increase of \$175,000 over the corresponding period of 1915, and that there was a great increased demand for freight.

The s.s. W. C. Moreland, which has been rebuilt at Superior, Wis., was renamed Sir Trevor Dawson, Oct. 18, by Mrs. J. W. Norcross, wife of the company's Vice President and Managing Director. The Sir Trevor Dawson is now one of the largest vessels on the Great Lakes. Her dimensions are, length 598½ ft., breadth 58 ft., depth 32 ft.; tonnage 7,215 gross, 5,505 register.

A claim against the company under the Ontario Workmen's Compensation Act, by the parents of a seaman who was washed overboard from the s.s. C. A. Jaques, when on a voyage from Sydney, N.S., to Manchester, Eng., has failed. On behalf of the claimants, it was urged that there was an absence of lifebuoys and life lines on deck, but it was held that there was no evidence that had there been lifebuoys on deck anyone could or would have thrown one or more overboard, or if it had been done, that it would have been any kind of help, also that it was hardly possible that there was not plenty of rope on board, and if there were not life lines, it was the fault of the master and crew and not of the company.

The company's operations on the Atlantic Ocean for the past year form interesting reading. Twenty-two of its vessels were engaged in trading to and from different points on the ocean, and of that number, five have been lost, three of them being directly due to enemy's attacks, and the other two losses being presumed as perils of the sea. These were the Donacona, Dunelm, Empress of Fort William, Empress of Midland, and Midland Queen. The s.s. Wahcondah, after completing her charter trip to Great Britain, was, after running a special trip on the company's account, sold to British parties. Several of the vessels will be engaged with the Quebec Steamship Co., one of the company's subsidiaries, during the winter, on the West Indies route.

Manchester Liners, Ltd., reports a profit of £181,389 for the year ended June 30, after providing for debenture interest, preference share dividend, directors' fees, depreciation, reserve for excess profits duty and income tax. From this amount £100,000 has been placed to reserve, bringing that account up to £170,000, and a dividend of 10%, together with a bonus of 15%, has been paid on the ordinary shares. Of the balance, £5,565 has been transferred to first debenture reserve fund, and £20,176 carried forward to the current year's accounts.

Toronto Hamilton and Buffalo Navigation Company.

A car ferry service was inaugurated, Oct. 20, across Lake Erie, between Ash-tabula Harbor, Ohio, and Port Maitland, Ont., by the car ferry Maitland no. 1, in charge of Capt. R. T. Haagenson, to handle freight between the New York Central main line, Erie, Pa., and west, to and including Elyria, South Lorain and Toledo, Ohio, and the Oil City and Youngstown Branches, and from Pittsburg & Lake Erie Rd. stations, destined to C.P.R. territory in Canada now reached by the Buffalo gateway; to Michigan Central Rd. stations in Canada east of St. Thomas and London, Ont., inclusive; and to stations on the Toronto, Hamilton and Buffalo Ry., and the Niagara, St. Catharines and Toronto Ry. Class and commodity tariffs naming through joint rates via the Niagara frontier between points mentioned have been supplemented adding the Toronto, Hamilton and Buffalo Navigation Co. as a participating carrier, which makes the through rate applicable via the car ferry route. In addition to this, tariffs have been published to and from Port Maitland on such commodities as are now handled on the combination of local rates via Black Rock. The car ferry route will handle carload traffic and cars with less than carload shipments with a minimum of 10,000 lbs. The route affords a direct cross-lake service between Canadian and U.S. points in territories outlined above.

Following are the company's officials:—J. N. Beckley, President, Rochester, N.Y.; F. F. Backus, Vice President, Hamilton, Ont.; G. C. Martin, General Traffic Manager, Hamilton, Ont.; A. E. Lock, Superintendent Car Service, Hamilton, Ont.; G. W. Holmes, Purchasing Agent, Hamilton, Ont.; F. O. Waldo, Auditor, Detroit, Mich.; H. J. VanVleck, Assistant Auditor, Detroit, Mich.; W. R. Beckley, Secretary, Rochester, N.Y.; W. E. Hackett, Treasurer, Detroit, Mich.; R. R. Richards, Auditor of Disbursements, Detroit, Mich.; A. S. Dutton, Auditor of Freight Accounts, Detroit, Mich.; J. M. Eedson, Freight Claim Agent, Hamilton, Ont.

Load Lines and Bulkheads.—The general question of load lines and bulkheads has been coming up each year for some time past, and a definite action has now been taken by a special conference of about 40 representative shipbuilders, owners, naval architects and marine engineers, at the office of the Secretary of Commerce, in Washington, D.C. A preliminary committee has been appointed, consisting of the President of the American Society of Naval Architects and Marine Engineers, the President of the New York and Cuba Mail Steamship Co., who is also Chairman of the American Committee of Lloyd's Register of Shipping, and the President of the Newport News Shipbuilding and Drydock Co. This committee will designate a larger committee of seven to formulate general policies on load lines and bulkheads, and report to the Secretary of Commerce and the Shipping Board, when that body is appointed under the new Government Shipping Act, whence it will pass on to Congress for legislation. The Dominion Marine Association has been consulted and will keep in touch with the Canadian view, reasonable legislation with due regard to all requirements being considered desirable.

Livingstone Channel Navigation Regulations.

Amendments to the rules and regulations governing the navigation of the lower Detroit River, have been approved by the Governor in council, as follows:—

No vessel of 100 gross tons or over shall navigate the Livingstone Channel at a rate of speed greater than 12 statute miles an hour between its junction with the Amherstburg Channel at Ballard's reef and the Bar Point light vessel;

No vessel shall pass another vessel bound in the same direction in that portion of Livingstone Channel between its junction with the Amherstburg Channel at Ballard's Reef and Bar Point light vessel, nor at any other portion of either channel where the width of the channel is restricted by improvements in progress. Between any two down bound vessels entering or navigating that portion of the Livingstone Channel between its junction with the Amherstburg Channel at Ballard's Reef and the Bar Point light vessel, there shall be an interval of not less than 5 minutes.

Quebec Bridge Centre Span.—The Marine Department has issued the following notice to mariners,—"On Sept. 11 the centre span of the Quebec Bridge built to span the space between the cantilever arms collapsed while being hoisted into position and sank in the river. The channel in the vicinity has been swept to a depth of 50 ft. at low tide and found to be clear of obstruction to this depth."

Military Recruiting Among Merchant Seamen.—For the third time this year a notice has been issued from the headquarters of the 4th Military District at Montreal to the different units recruiting in that area to the effect that recruiting among merchant seamen must cease. It is pointed out that the seamen in port are signed on ships' articles, and in order to enlist, they must desert, and lay themselves open to serious punishment.

Stranding of the Shintsu Maru.—An enquiry was opened at Victoria, B.C., Oct. 13, into the cause of the stranding of the Japanese s.s. Shintsu Maru at Roberts' Point, Gulf of Georgia, Sept. 22, by Capt. J. D. Macpherson, Wreck Commissioner for British Columbia, assisted by Capt. Bucknam and Clarke as nautical assessors. Owing to the refusal of the pilot, H. R. Jones, to give evidence, on the ground that he had already been punished for the mishap, by having his license suspended for three months by the Vancouver Pilotage Authority, the enquiry was adjourned, and the matter referred to the Minister of Marine for further instructions.

Norwegian Shipbuilding in Canada.—It is reported that Otto Dahl, representing a Norwegian syndicate, is visiting Canada and the United States, in order to see what space is available for building steel steamships, and to place contracts for a number, possibly 30. He is reported to have said that, prior to the war, most of the Norwegian vessels were built in England, but the shipbuilding plants there are not at present available for outside work. An order for the construction of six steamships of 8,800 tons register is said to have been placed with Wallace Shipyards, Ltd., Vancouver, and negotiations are proceeding for the placing of an order for another two similar vessels at a plant proposed to be established at False Creek, Vancouver.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Chicago Car Heating Co.—Jos. E. Buker, General Sales Manager, has been elected Vice President.

Taylor & Arnold, Limited, railway material and supplies, 404 St. James St., Montreal, have appointed N. G. Shenton as Sales Engineer.

Drew Electric & Manufacturing Co., manufacturers of electric railway, light, power and gas materials, Indianapolis, Ind., have appointed the C. E. A. Carr Co., Toronto, agents for Canada.

Roberts & Schaefer Co., engineers and contractors, Chicago, report the following orders. From Union Ry. for automatic electric, reinforced concrete, standard counter-balanced bucket, locomotive coaling plant and sand handling facilities at Sergeant Yard, Memphis, Tenn. From St. Louis, Iron Mountain & Southern Ry. for a 250-ton capacity automatic electric reinforced coaling plant at Dupo Yard, St. Louis, Mo. The Nevada Northern Ry. will build a Roberts & Schaefer automatic electric, reinforced concrete, coaling plant at East Ely, Nevada, using the new duplex shallow pit loader.

Locomotive Superheater Co., 30 Church St., New York, has issued bulletin 1, "Marine Superheaters," containing 12 pages of illustrated matter describing installations of fire tube marine superheaters on various vessels and giving results obtained. The bulletin is enclosed in a durable loose leaf cover, so that additional bulletins which will be issued from time to time, dealing with features of interest in connection with the use of superheated steam in marine power plants, may all be bound together and make a permanent ready reference book of marine superheater information.

The Decimal System for Japanese Tariffs.—The Japanese Government has authorized the Toyo Kisen Kaisha to amend its freight and passenger rates between Japan and the North American continent and South America, by the adoption of the decimal system. Its tariffs are to be issued with rates shown in dollars and cents, instead of sterling, as heretofore.

Grain Handling in Canada.—The Board of Grain Commissioners which was appointed recently as a special commission to enquire into the whole matter of handling and marketing grain in Canada, and in particular the grading and weighing, the shipping from country elevators, grain exchanges, financing, handling at terminal points and charges for same, shipment to Atlantic ports, and lake shipments, is continuing its enquiries, and gathering information on the various heads mentioned. Meetings of the Dominion Marine Association's grain section have been held to give special consideration to the shipment of Canadian grain to the seaboard, and with reference to the causes for the passage of damaged grain through U.S. ports. A report on these subjects has been drawn up and sent to the commission for consideration and report.

Transportation Conventions in 1916.

Nov. 14.—National Association of Railway Commissioners, Washington, D.C.
 Nov. 15.—American Railway Association, Denver, Col.
 Dec. 5-7.—Railway Gardening Association, New Orleans, La.
 Dec. 12, 13.—Association of Transportation and Car Accounting Officers, Atlanta, Ga.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated:
 Canadian Car Service Bureau—W. J. Collins, Manager, 401 St. Nicholas Building, Montreal.
 Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.
 Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.
 Canadian Freight Association (Western lines)—W. E. Campbell, 805 Boyd Block, Winnipeg.
 Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.
 Canadian Ticket Agents' Associations—E. de la Hooke, London, Ont.
 Dominion Marine Association—F. King, Counsel, Kingston, Ont.
 Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.
 Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.
 Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.
 Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.
 Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.
 Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.
 International Water Lines Passenger Association—M. R. Nelson, New York.
 Niagara Frontier Summer Rate Committee—James Morrison, Montreal.
 Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.
 Quebec Transportation Club—A. F. Dion, Quebec.
 Shipping Federation of Canada—Thos. Robb, Manager, 42 St. Sacrament Street, Montreal.
 Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.
 Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.

Transportation Club of Vancouver.—H. W. Schofield, 553 Granville St., Vancouver, B.C.
 Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.
 Western Canada Railway Club—Louis Kon, Box 1707 Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.
 Winnipeg Traffic Club—James Gehrey, Bannatyne Avenue, Winnipeg, Man.

Ocean Steamship Co., Ltd., has been incorporated under the Dominion Companies Act, with \$200,000 capital and office at Montreal, to own and operate steam and other vessels, warehouses, wharves, docks, piers, etc., and to carry on a general warehouse and navigation business. The incorporators are,—C. Pringle, N. G. Guthrie, R. A. Blake, W. R. Stitt and E. B. Johnson, Ottawa, Ont.

The Dominion Marine Association has given \$400 to the Upper Canada Tract Society towards the expense of the Sailors' Institute, which is being established on the lake front between Yonge and Bay Sts., Toronto.

Midland Dry Dock Co., Limited

JAMES WILKINSON, Manager

BUILDERS OF

STEEL TUGS, SCOWS AND DREDGE HULLS

Special Attention Given to all kinds of Hull Repairing.

Steel and Wood Plant Operated by
Hydro-Electric Power. Always Ready.

Midland, Ont.

Day Telephone 258. Night Telephones 254 and 348.

The Canadian Bridge Co., Limited

Walkerville, Ontario

Locomotive
Turntables
Roofs
Steel Buildings

Manufacturers of
Railway and Highway
BRIDGES

Structural
Iron Work
of all
Descriptions

DEPARTMENT OF RAILWAYS AND
CANALS, CANADA.

CANADIAN GOVERNMENT
RAILWAYS.

Superstructure of Elevator, St. John, N.B.
Sealed Tenders, addressed to J. W. Pugsley, Secretary of the Department of Railways and Canals, Ottawa, Ont., and marked on the outside, "Tender for Superstructure of Elevator, St. John," will be received up to and including twelve o'clock noon, Wednesday, November 15th, for the construction of a reinforced concrete grain elevator with a capacity of 500,000 bushels.

Plans, specifications and blank form of contract may be seen at the offices of the following, on and after October 16th: Chief Engineer, Department of Railways and Canals, Ottawa.

Chief Engineer, Canadian Government Railways, Moncton, N.B.

General Superintendent, Winnipeg, Man. Resident Engineer, Fort William, Ont.

John S. Metcalf Company, Ltd., Engineers, Montreal, Que.

Contractors who wish to obtain plans and specifications temporarily for their own use, may obtain same from any of the offices at which plans are on exhibition, on depositing a certified bank cheque in favor of the Canadian Government Railways for the sum of one hundred dollars (\$100), which will be refunded on the return of the plans and specifications.

All the conditions of the specifications and contract form must be complied with.

Tenders must be submitted in duplicate on the blank form of tender which may be obtained from any of the offices at which plans are on exhibition.

Each tender must be accompanied by a certified bank cheque payable to the Honorable the Minister of Railways and Canals equal to ten per cent. (10%) of amount of tender.

The lowest or any tender not necessarily accepted.

F. P. GUTELIUS,

General Manager,

Canadian Government Railways.
Moncton, N.B., Oct. 12th, 1916.

Control of British Vessels in Atlantic Ports.—Owing to the appearance of a German submarine vessel in Atlantic waters, recently, after visiting a U.S. port, and the subsequent sinking of some vessels, the control of British and allied vessels at various ports on the Atlantic coast was placed in the hands of the Commandant of the British Naval Forces at Halifax, N.S., without whose permission no vessel belonging to these nations was allowed to leave any port. So far as U.S. ports were concerned, the Naval Commandant acted through the British Naval Attache at New York.

The Manchester Ship Canal Co. has declared a dividend of 72c a share on the preference shares and 36c a share on the ordinary shares, for the year concluded recently. During 1915, the traffic was 5,115,954 tons, and the receipts \$3,685,244. The balance after the payment of all operating and fixed charges, was \$729,770. The ordinary dividend is the first one paid. Those who remember the antagonism to the enterprise in its construction days, and the struggles of the early operating period, will be much pleased with the later results.

"BEATTY" HOISTS

For situation where the work is severe and the service exacting—"a Beatty always fills the bill"



Derrick car engined with an 8 x 12 four drum Beatty Hoist placing an 80 foot deck plate girder span in Skugog River Bridge.

Let us know your requirements for

Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

We will gladly send full information.

M. Beatty & Sons Limited - Welland

Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg, Winnipeg.

"Claude" Oxygen Oxy-Acetylene

WELDING AND CUTTING PLANTS

MADE IN CANADA

All large railway shops are applying our systems to numerous uses. Welding frames, building up tires, boiler patches, welding flues. Also for cutting up scrap.

Cut out coupon for interesting booklet.

L'Air Liquide Society

Three Canadian Distributing
Stations

26 Boler Street, West Toronto
325 William Avenue, Winnipeg
Maisonneuve, Montreal

L'Air Liquide Society, Maisonneuve,
MONTREAL, P.Q.

Gentlemen.—Will you please send, without obligation to me, postpaid, your New Booklet?

Name
Address
Province Date
Business

R & M

To Investors

THOSE WHO, FROM TIME TO TIME, HAVE FUNDS REQUIRING
INVESTMENT, MAY PURCHASE AT PAR

DOMINION OF CANADA DEBENTURE STOCK

IN SUMS OF \$500 OR ANY MULTIPLE THEREOF.

Principal repayable 1st October, 1919.

Interest payable half-yearly, 1st April and 1st October by cheque (free of exchange at any chartered Bank in Canada) at the rate of five per cent per annum from the date of purchase.

Holders of this stock will have the privilege of surrendering at par and accrued interest, as the equivalent of cash, in payment of any allotment made under any future war loan issue in Canada other than an issue of Treasury Bills or other like short date security.

Proceeds of this stock are for war purposes only.

A commission of one-quarter of one per cent will be allowed to recognized bond and stock brokers on allotments made in respect of applications for this stock which bear their stamp.

For application forms apply to the Deputy Minister of Finance, Ottawa.

DEPARTMENT OF FINANCE, OTTAWA,
OCTOBER 7th, 1916.

C. W. Sherman, Pres. and Gen. Mgr.

F. W. Ballie, Vice-Pres.

A. G. Wright, Secy.

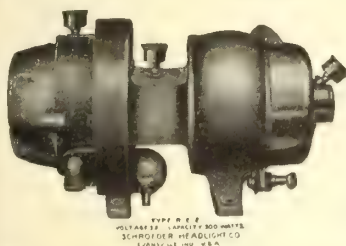
Dominion Steel Foundry Company, Limited, Hamilton, Ont.

Locomotive Frames

Car Bolsters

Car Castings

Heavy Machinery Castings



70 Schroeder Incandescent Headlights

In Service

270 days without any expense for repairs.
As a result of this exceptional service
150 more have just been ordered.

The HIRAM L. PIPER CO., Limited

MONTREAL, Sole Agents for Canada

It Pays to carry an advertisement in the Canadian Railway and Marine World every issue of the year because you obtain proportionately better **Results**

Complete Hydraulic Equipment

For Railway and Shipbuilding Plants

Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc. Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast Iron Pipe, Hydrants, Valves and Fittings, etc.

R. D. WOOD & CO. Philadelphia, Pa.

Car Closets

Flush or Dry

DUNER CO.

101 S. CLINTON ST.
CHICAGO



THE STAR BRASS WORKS
KALAMAZOO, MICH.



The Star Brass Works

Largest Exclusive Trolley Wheel Makers in the World.

Kalamazoo

Michigan



Canada Iron Foundries, Limited

Chilled Tread Cast Iron Car Wheels for All Services
Cast Iron Water, Gas and Culvert Pipe,
Flanged Pipe and Specials
Railway Castings

HEAD OFFICE :

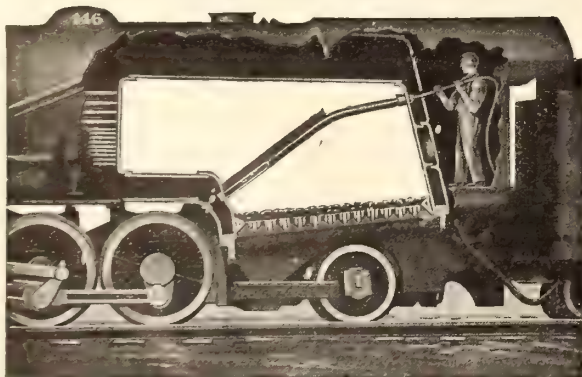
Mark Fisher Building

- - -

Montreal



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes.

Lagonda Arch Tube Cleaners

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

Other Lagonda Boiler Room Specialties are described in our General Catalogue L. Send for Copy.

Babcock and Wilcox, Limited

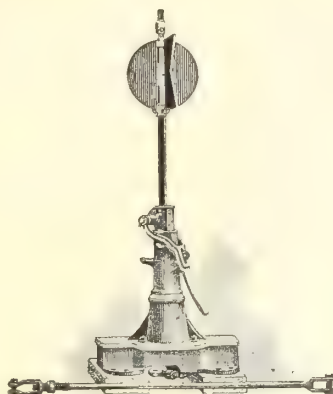
Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Building

RAMAPO

**Automatic
Safety
Switch
Sands**

in types to suit every
purpose, Main Line,
Sidings and Yards

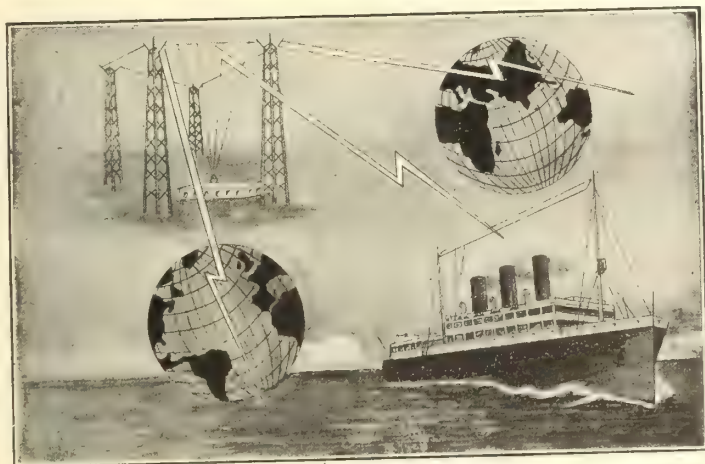


We also
make

**FROGS
SWITCHES
CROSSINGS**

in both all rail
and Manganese

CANADIAN RAMAPO IRON WORKS, Limited, Niagara Falls, Ont., Can.



MADE IN CANADA

Marconi Wireless Telegraph Apparatus

Ship sets suitable for liners, yachts, tugs, freighters
and scows our speciality.

Have you considered the advantage of connecting up
factory or mine to head office by wireless? We will sell
or rent you a system to cover all your requirements.

Of the world's wireless stations 80% are **Marconi**.
Consult: "Marconi" the World-Wide Wireless

Canadian Marconi Company

Head Office, 137 McGill St., Montreal

**Canadian
Government
Railways**

**4
Nationals**

for
Western Canada, Pacific Coast

NEW trains via **NEW** route, through **NEW** country
making **NEW** links
between the

ATLANTIC and PACIFIC

connecting HALIFAX - SYDNEY - ST. JOHN, with

QUEBEC-COCHRANE-WINNIPEG

SHORTEST ROUTE - QUICKEST TIME

The **Western-National**

The **National Atlantic**

Through Observation Sleeping Cars

Dep. Quebec 2.00 p.m. Tue. Thur. Sat.	Dep. Winnipeg 5.15 p.m. Sun. Tue. Thur.
Arr. Cochrane 4.10 p.m. Wed. Fri. Sun.	Dep. Cochrane 7.15 p.m. Mon. Wed. Fri.
Arr. Winnipeg 4.30 p.m. Thur. Sat. Mon.	Arr. Quebec 9.10 p.m. Tue. Thur. Sat.

TORONTO-WINNIPEG

The **National** (west bound)

Through Sleeping and
Dining Car Service

The **National** (east bound)

Dep. Toronto 10.45 p.m. Tue. Thur. Sat.	Dep. Winnipeg 5.15 p.m. Sun. Tue. Thur.
Arr. Winnipeg 4.30 p.m. Thur. Sat. Mon.	Arr. Toronto 12.05 p.m. Tue. Thur. Sat.

**Canadian
Government
Railways**

**4
Nationals**

for
Yukon - Alaska



Money paid for these Brake Shoes was largely money wasted

Why?

Because these unreinforced brake shoes did not give equivalent service for their cost, having broken in service before their life had barely commenced.

And the remedy?

Use only Reinforced Brake Shoes—then you will get your brake shoe money's worth in long and safe service.

Manufactured in Canada.

Dominion Brake Shoe Company, Limited

The HOLDEN CO., Limited, Agents,
350-356 St. James Street, MONTREAL

Thor

Reversible Pneumatic Wood-Boring Machines

Three sizes—with capacity up to 4 inches. Size BW is shown boring 1½ in. holes in 24-in. x 24-in. oak timber for launching ways. Most durable, powerful and economical woodborers made.

Improved methods of manufacturing and increased production enable us to offer Thor Tools for "Immediate Delivery."

SHIPPED ON TRIAL—FREE.

Independent Pneumatic Tool Company

334 St. James Street, Montreal, Que.



"STERLING" Hack Saw Blades

are made to suit all requirements. You will find them invaluable for your work.



You will find "Sterling" Blades a satisfactory and economical investment.

Manufactured by
Diamond Saw & Stamping Works
BUFFALO, N.Y., U.S.A.

ENAMELED IRON SIGNS

The ideal signs for
Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.

We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc,

Guaranteed not to
fade or be affected
by the weather in
any way.

Acton Burrows
Limited

Enameled Iron Signs

70 Bond Street - Toronto

Dominion Bridge Company, Limited

Head Office and Works,
MONTREAL, P.Q.

Branch Offices and Works,
TORONTO, OTTAWA and WINNIPEG



Lachine Bridge

Engineers, Manufacturers and Erectors of Steel Structures.
CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

Large Stock of Standard Structural Material at all Works.

Hunt-Spiller Gun Iron

IN

Locomotive Castings

SAVES MONEY

INCREASES: Engine Efficiency—Engine Mileage.

DECREASES: Engine Failures—Engine Repairs.

MADE ONLY BY

Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.

J. G. Platt,
Sales Manager.

Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.



The Trained Man Wins

In the railroad business it's the *trained* man who wins. Carrying hundreds of millions of passengers every year, it is absolutely necessary that the responsible positions in railroading be filled with none but the most highly trained men. Your advancement will depend largely on the thoroughness of your training.

If you really *want* a better job and are willing to devote a little of your spare time to getting ready, the **International Correspondence Schools** can help you. More than two hundred of the railroad systems of the United States and Canada have indorsed the **I. C. S.** method of instruction and recommended it to their employes.

You're ambitious. You want to get ahead. Then don't turn this page until you have clipped the coupon, marked the line of work you want to follow and mailed it to the **I. C. S.** for full particulars. Doing so will not obligate you.

INTERNATIONAL CORRESPONDENCE SCHOOLS Box 8410, SCRANTON, PA.

Explain, without obligating me, how I can qualify for the position, or in the subject, before which I mark X.

- | | |
|---|---|
| <input type="checkbox"/> Locomotive Engineer | <input type="checkbox"/> R. R. Agency Accounting |
| <input type="checkbox"/> Locomotive Fireman | <input type="checkbox"/> R. R. Gen'l Office Ac'g'g |
| <input type="checkbox"/> Traveling Engineer | <input type="checkbox"/> Bookkeeper |
| <input type="checkbox"/> Traveling Fireman | <input type="checkbox"/> Stenographer and Typist |
| <input type="checkbox"/> Air Brake Inspector | <input type="checkbox"/> Higher Accounting |
| <input type="checkbox"/> Air Brake Repairman | <input type="checkbox"/> Mathematics |
| <input type="checkbox"/> Round House Foreman | <input type="checkbox"/> Good English |
| <input type="checkbox"/> Trainmen and Carmen | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> Railway Conductor | <input type="checkbox"/> Advertising Man |
| <input type="checkbox"/> Mechanical Engineer | <input type="checkbox"/> Civil Service |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> Railway Mail Clerk |
| <input type="checkbox"/> Machine Shop Practice | <input type="checkbox"/> Electrical Engineer |
| <input type="checkbox"/> Boiler Maker or Designer | <input type="checkbox"/> Electrician |
| <input type="checkbox"/> Steam Engineer | <input type="checkbox"/> Electric Wiring |
| <input type="checkbox"/> Steam Electric Engineer | <input type="checkbox"/> Electric Lighting |
| <input type="checkbox"/> Civil Engineer | <input type="checkbox"/> Telegraph Expert |
| <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> Mine Foreman or Engineer |
| <input type="checkbox"/> R. R. Constructing | <input type="checkbox"/> Metallurgist or Prospector |
| <input type="checkbox"/> Bridge Engineer | <input type="checkbox"/> Chemical Engineer |
| <input type="checkbox"/> Architect | <input type="checkbox"/> Agriculture |
| <input type="checkbox"/> Architectural Draftsman | <input type="checkbox"/> Vaultry Raising <input type="checkbox"/> Spanish |
| <input type="checkbox"/> Contractor and Builder | <input type="checkbox"/> Automobiles <input type="checkbox"/> German |
| <input type="checkbox"/> Structural Engineer | <input type="checkbox"/> Auto Repairing <input type="checkbox"/> French |
| | <input type="checkbox"/> Italian |

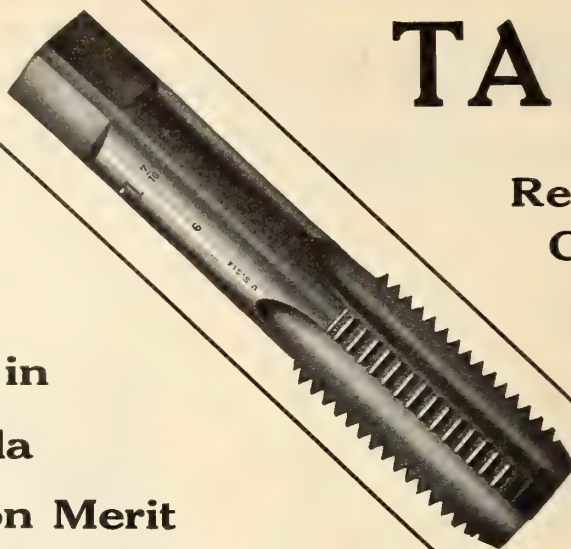
Name _____
 Occupation _____
 & Employer _____
 Street _____
 and No. _____
 City _____ State _____

If business of course you want is not in this list, write it below

TAPS

Reamers
Cutters
Drills
Dies

Made in
Canada
Sold on Merit



Ask for our new catalogue No. 8

Pratt & Whitney Co.
of Canada, Limited

DUNDAS

ONTARIO

Montreal

Vancouver

Winnipeg

JOLIETTE STEEL CASTINGS

TRADE MARK REGD.

Your needs for car and locomotive steel castings are most satisfactorily filled by drawing upon the capacity and organization of

**Joliette Steel Company
Limited**

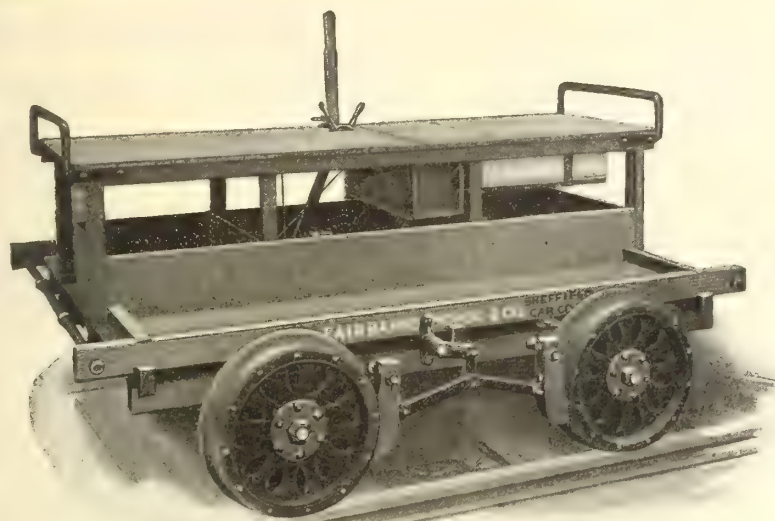
Main Office
903 Read Bldg., Montreal, Que.

Works at
Joliette, Que.

Telephone Main 402

CASTINGS MADE IN CANADA

Ontario Representatives—Allen General Supplies Limited
205 Yonge Street, Toronto



Over 11,000 Fairbanks-Morse Cars in Service

They give the longest service for the least expense.

They are built in an exclusive Motor Car Shop by men who know how to build good cars.

They are so simple in design that the least experienced can handle them successfully.

Let us tell you all about them

The Canadian Fairbanks-Morse Co., Limited

ST. JOHN, QUEBEC, MONTREAL, OTTAWA.
TORONTO, HAMILTON, WINNIPEG, SASKATOON,
CALGARY, VANCOUVER, VICTORIA

CANADA'S
DEPARTMENTAL
HOUSE FOR
MECHANICAL
GOODS



MONEL
METAL
Reg. U.S. Pat. Off.

NICKEL

Shot—High and low carbon.

Ingots—Two sizes, 25 lbs., 50 lbs.

Electrolytic Nickel—99.80 p.c.

Prime Metals for the Manufacture of Nickel Steel, German Silver, Anodes and all remelting purposes. Our Nickel is produced as Rods, Sheets, Strip Stock, Wire and Tubes.

We are SOLE PRODUCERS of this natural stronger-than-steel, non-corrodible alloy. Manufactured forms are Rods, Flats, Castings, Tubes, Sheets, Strip Stock and Wire. Send Inquiries Direct to Us.

The International Nickel Co., 43 Exchange Place, N.Y.

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. BABBITTS. Miscellaneous Brass Castings for Railroads.

Works and Office: 69 Delorimier Avenue, MONTREAL, QUE.

STANDARD Wires and Cables

Wire Rods,
Bare Copper Wire,
Brass and Bronze Wires,
Standard C.C.C. Wire,
(Colonial Copper Clad)
Magnet Wire,
Weatherproof Wire,
Rubber Insulated Wires,
Varnished Cambric Cable,
Fibre Lead-Covered Cable,
Paper Lead-Covered Cable,
Rubber Lead-Covered Cable,
Armored Cable,

and Cable Accessories

Cable Terminals,
Cable Junction Boxes,
"Ozite" Insulating Compounds,
Miscellaneous Cable Accessories of
all Kinds,
Cable Installations.

For detailed information, samples, estimates or prices, write our nearest office.

Standard Underground Cable Co.
of Canada, Limited

HAMILTON, ONT.

Montreal, Que. Seattle, Wash.
Winnipeg, Man.

ESTABLISHED 1849.

BRADSTREET'S

Capital and Surplus, \$1,500,000.
Offices throughout the Civilized World.

Executive Offices:
NOS. 346 and 348 BROADWAY,
N.Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA:

Halifax, N.S.; Hamilton, Ont.; London, Ont.;
Montreal, Que.; Ottawa, Ont.; Quebec, Que.;
St. John, N.B.; Toronto, Ont.; Vancouver, B.C.;
Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.;
Victoria, B.C.

THOS. C. IRVING,

Gen. Man. Western Canada, Toronto.



Capital Authorized.....\$10,000,000
Capital Paid up.....7,000,000
Reserve Fund.....7,000,000

Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the World.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.



Copyrighted by International News Service.

Why ?

A defective signal wire might easily cause just such an awful wreck as this.

Why take the chance ?

To safeguard your road against such catastrophes you should not only have the best signalling equipment but you must use

Northern Electric Railway Signal Wire

No conditions impose a severer test on wire than those used in connection with a railroad signalling system.

Northern Electric R.S.A. wire meets the R.S.A. specifications in every particular and goes a step further—it meets the more rigid Northern Electric specifications which gives you, the user, double protection.

Buy your wire and cable from the largest makers in Canada.

Northern Electric Company LIMITED

MONTREAL HALIFAX TORONTO WINNIPEG
REGINA CALGARY VANCOUVER

The Preston Car & Coach Co., Limited

Preston, Ont.

Manufacturers of

Steam and Electric
Railway Cars and
Special Cars.

The Ottawa Car Manufacturing Co., Limited

Builders of

Electric Cars, Snow
Sweepers and Plows

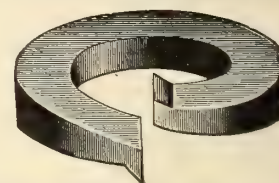
Also

Producers of Brass
Castings of Every
Description.

Slater Street - Ottawa

The Positive Lock Washer

is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks

The Positive Lock Washer Co.
Sole Mfrs., Newark, N.J.

F. H. HOPKINS & CO., Agents, Montreal

CHICAGO CAR HEATING CO.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES

Canadian Factory and Office—61 Dalhousie St., Montreal A. D. BRUCE, Agent

GENERAL OFFICES:
RAILWAY EXCHANGE, CHICAGO, U.S.A.
NEW YORK, GRAND CENTRAL TERMINAL BLDG.
ATLANTA GA., CANDLER BLDG.
WASHINGTON, D.C., MUNSEY BLDG.

Sessions-Standard Friction Draft Gear

Simplest and Best

Both
Made by

Standard Coupler Co.
30 CHURCH STREET, NEW YORK

Standard Steel Platforms

Used by all Canadian Railways

Engineers and Contractors

Locomotive COALING STATIONS
ROBERTS AND SCHAEFER CO.
ENGINEERS AND CONTRACTORS
 CHICAGO, U.S.A.

Edward F. Terry President
 Frederick Tench V. P. & Treas.
The TERRY & TENCH CO., Inc.
Bridge Builders
 General Contractors, Engineers and Designers
 Grand Central Terminal NEW YORK

THE ARNOLD COMPANY
 ENGINEERS—CONSTRUCTORS.
 ELECTRICAL—CIVIL—MECHANICAL
 REPORTS, DESIGN AND CONSTRUCTION
 Complete Railway Shop and Terminal Properties—
 Electrification of Steam Railroads.
 OUR EXPERIENCE COVERS THIRTY-FIVE PLANTS
 NEW YORK CHICAGO

ANGUS SINCLAIR, C.E.
Railway Contractor

Office: Imperial Bank Building,
 King and Sherbourne Sts., Toronto.

Patent Solicitors

PATENTS SECURED OR OUR FEES RETURNED.
 Being next door to the Patent Office; we have personal interviews with Examiners, thus earlier allowance of your Patents. We have access to all Records and solicit the business of Manufacturers, Engineers and others who realize the advisability of having their Patent business transacted by Experts.
HAROLD C. SHIPMAN & CO.
 Reg. Patent Attorneys. Ottawa, Canada

PATENTS
HERBERT J. S. DENNIS
 Mechanical Engineer, Patent Attorney and Expert.
 Patents, Trade Marks, Designs, Copyrights, and Infringements. 20 Years experience in Patents and Practical Engineering.
 Star Building, 18 King Street West, Toronto
 WRITE FOR BOOKLET.



BIG GAME IN CANADA

The Finest Hunting
 Grounds in America

ARE CONVENIENTLY REACHED VIA

CANADIAN PACIFIC

Particulars from Canadian Pacific Agents or
 W. B. HOWARD, District Passenger Agent, Toronto.



Showing the construction of our geared jacks.

Celebrated "H & E" Lifting Jack

Our Patent Ball-Bearing Geared Jacks are Ideal in Railroad and Heavy Construction Work.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited
 SHERBROOKE, QUE.

Sole Agents for Brakeshoes for Canada outside of B.C., Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for B.C., The B.C. Equipment Co., Vancouver, B.C. Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.

High Grade Electric
STEEL CASTINGS
MANGANESE STEEL
 For Crusher Jaws and Heavy Wear Parts

RONZE
 M.C.B. Standard Journal Bearings and Engine Bearings

Improved Reinforced Steel-Backed
BRAKESHOES
 Locomotive Driver and Truck Shoes. Freight and Passenger Car and Electric Car Shoes.

ROBERT W. HUNT
 THOS. C. IRVING JR.

CHARLES WARNOCK
 JAS. W. MOFFAT

Robert W. Hunt & Co., Limited

**Consulting and Inspecting Engineers
 Chemists and Metallurgists**

Expert examination and tests of all steel and metal products; Bridges, Buildings, Cement; Electrical and Mechanical Plant Equipment; Rails and Fastenings; Cars; Locomotives; Pipe; Castings; Forgings; Lumber; Paving Materials.

Resident inspectors at all important manufacturing centres in Canada, the United States and Great Britain.

REPORTS ON PROPERTIES AND PROCESSES.

Head Office and Laboratories:

McGill Building,
 Branches: TORONTO

VANCOUVER

MONTREAL, QUE.

LONDON, ENGLAND

Rails, Cars,
 Locomotives
 and Contractors' Equipment

IMMEDIATE
 SHIPMENT

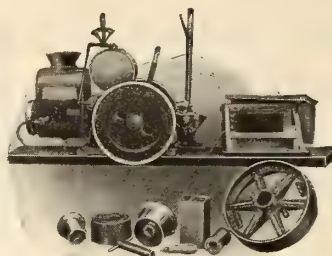
John J. Gartshore
 58 Front St. West
 TORONTO

ARE YOU ONE OF THE PUMPER

?

*A "Fairmont" on your car
makes the days work easy.*

FAIRMONT



ENGINES

Our catalogue of handcar engines, general purpose and roadmasters inspection cars tells you how to stop being a "pumper" and shows you how to save time for the company and work for yourself.

Thousands of section men, roadmasters and officials on Canadian, United States and South American railroads are now using FAIRMONT engines and motor cars.

Our EASY PAYMENT plan makes it possible for you to own a Fairmont. Write for our catalogue and easy terms TODAY.

Quantity prices to railroads.

FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

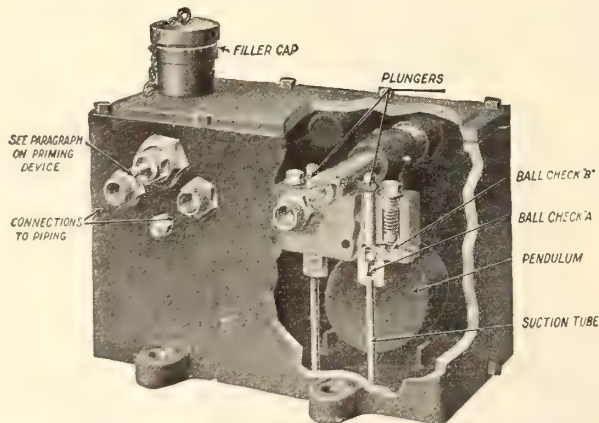
FORMERLY FAIRMONT MACHINE CO.

445 N. MAIN ST., FAIRMONT, MINN., U.S.A.

The Pendulum Has Served Man Well

A swinging lamp filled with oil first suggested the use of the pendulum for measuring time, and way back in the 14th century it replaced all other methods for such service. In the

Detroit Automatic Flange Lubricator (Pendulum Type)



A swinging pendulum operated by the lateral movement of the locomotive, operates the pump of a tank filled with oil and automatically forces the oil to the flanges.

Just as other methods of measuring time were discarded through the discovery of the value of the pendulum, so other methods of flange lubrication are fast being discarded through the invention of the Detroit Automatic Flange Oiler.

Man knows the Value of the Pendulum.
Send for Booklet FO-75. Its full of facts.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.
WALKERVILLE, ONT.

Makers of the Stewart Carburetor.

**John Morrow Screw & Nut Co.,
Limited.**

BUSINESS AS USUAL

Set Screws
Cap Screws
Nuts, every variety
of finish
Twist Drills, etc.

Customers are requested to place their specifications with us as far ahead of their actual needs as possible so that we may give them good service.

INGERSOLL - ONTARIO

Electric Railway Supplies

Detroit Controller Checks.
Peerless Check Valves.
Hollis Safety Fender.
Bakalite Arch-leaves, Brush holders
Yokes and Rods.
Bakalite Washers and Asbestos
Board.
Gongs, Bells and Air Whistles.

Allen General Supplies, Ltd.
205 Yonge Street Toronto

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies.

AERATED WATERS

E. L. Drewry
AIR BRAKES AND FITTINGS
Canadian Westinghouse Co.

ALES

E. L. Drewry

ANGLE BARS
Steel Co. of Canada

AUTOMOBILES
Preston Car & Coach Co.

AXLES

Nova Scotia Steel and Coal Co.

Jas. W. Pyke & Co.

Steel Co. of Canada.

BATTERIES, DRY

Canadian National Carbon Co.

BATTERIES, SIGNAL

Canadian National Carbon Co.

BATTERIES, STORAGE

Canadian National Carbon Co.

BATTERIES, TRACK

Canadian National Carbon Co.

BATTERY SUPPLIES

Canadian National Carbon Co.

BATTERP SUPPLIES

Canadian National Carbon Co.

BOILER COMPOUND

Dearborn Chemical Co. of Canada

BOILERS

M. Beatty & Sons

F. H. Hopkins & Co.

Folsom Iron Works

BOILERS, PORTABLE

Polson Iron Works

BOILERS, STATIONARY AND MARINE

Polson Iron Works

BOILERS, STEAM

Polson Iron Works

BOILERS, WATER TUBE

Babcock & Wilcox

Polson Iron Works

BOLTS AND NUTS

Steel Co. of Canada

BOLTS, TRACK

F. H. Hopkins & Co.

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

BORERS, CAR WHEEL

John Bertram & Sons Co.

Canada Machinery Corporation

BRAKE BEAMS

Buffalo Brake Beam Co.

BRAKE SHOES

Canada Iron Foundries

Canadian Brakeshoe Co.

Dominion Brakeshoe Co.

BRAKE SHOES, LOCOMOTIVE DRIVER

Canada Iron Foundries

BRIDGE BUILDERS

Terry & Tench Co.

BRIDGE NUMBERS

Acton Burrows, Limited

BRIDGES

Canadian Bridge Co.

Dominion Bridge Co.

BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION

Canadian National Carbon Co.

BUCKETS, COAL, ORE AND CONCRETE

M. Beatty & Sons

Brown Hoisting Machinery Co.

F. H. Hopkins & Co.

BUILDINGS, STEEL

Canadian Bridge Co.

Dominion Bridge Co.

BUMPING POSTS

F. H. Hopkins & Co.

CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED

Standard Und. Cable Co. of Can.

CARBONS, ARC LAMP, FLARE ARC AND PHOTOGRAPHIC

Canadian National Carbon Co.

CAR CLEANER

Allen General Supplies, Ltd.

CAR SIGNAL SYSTEMS

Ohio Brass Co.

CARS

Eastern Car Co.

Hart-Otis Car Co.

National Steel Car Co.

Ottawa Car Mfg. Co.

Preston Car & Coach Co.

CASTINGS, BRASS

Canada Iron Foundries

Canadian Bronze, Limited

CASTINGS, CAR

Canada Iron Foundries

Dominion Brakeshoe Co.

CASTINGS, IRON

Canada Iron Foundries

Hunt-Spiller Manufacturing Corp.

CASTINGS, IRON AND STEEL

Dominion Brakeshoe Co.

Dominion Steel Foundry Co.

CASTINGS, MALLEABLE

Taylor & Arnold

CASTINGS, MANGANESE STEEL

Canadian Steel Foundries, Ltd.

CASTINGS, STEEL

Dominion Steel Foundry

Jolliette Steel Co.

CATERINARY MATERIALS

Ohio Brass Co.

CHAINS

B. J. Coghlin Co.

F. H. Hopkins & Co.

CLOSETS, CAR

Duner Co.

COAL

Nova Scotia Steel and Coal Co.

COAL CHUTES

Roberts & Schaefer Co.

COAL DOCK BRIDGES

Roberts & Schaefer Co.

COAL MINING AND WASHING PLANTS

Roberts & Schaefer Co.

COALING STATIONS

Roberts & Schaefer Co.

COMPRESSORS, AIR

Canadian Ingersoll-Rand Co.

F. F. Hopkins & Co.

CONCRETE MIXERS & ROCK CRUSHERS

F. H. Hopkins & Co.

CONTRACTORS' SUPPLIES

F. H. Hopkins & Co.

Rice Lewis & Sons

CONVEYORS, COAL AND ASH

Babcock & Wilcox

COPPER, RODS AND WIRE

Standard Und. Cable Co. of Can.

COUPLERS, CAR & LOCOMOTIVE

Canadian Steel Foundries, Ltd.

Ohio Brass Co.

Taylor & Arnold

CRANES

Brown Hoisting Machinery Co.

CRANES, WRECKING

F. H. Hopkins & Co.

CRANES, ELECTRIC

Babcock & Wilcox

Dominion Bridge Co.

F. H. Hopkins & Co.

CRANES, TRAVELLING

F. H. Hopkins & Co.

CROWBARS

B. J. Coghlin Co.

CULVERTS

Pedlar People, Ltd.

CURTAINS AND FIXTURES, CAR

Du Pont Fabrikoid Co.

Preston Car & Coach Co.

CUTS

Acton Burrows, Limited

DERRICKS

F. H. Hopkins & Co.

DIES

Butterfield & Co.

DITCHERS

M. Beatty & Sons

F. H. Hopkins & Co.

DIVING OUTFITS

John Date

F. H. Hopkins & Co.

DOOR SIGNS

Acton Burrows, Limited

DRAFT GEAR

Standard Coupler Co.

DREDGES

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

DRILLS

Canadian Ingersoll-Rand Co.

John Morrow Screw & Nut Co.

DRILLS, AIR

F. H. Hopkins & Co.

Independent Pneumatic Tool Co.

DRILLS, RADIAL

Canada Machinery Corporation

DRILLS, VERTICAL

Canada Machinery Corporation

DRILLS, WELL

F. H. Hopkins & Co.

DUMP CARS, CONTRACTORS'

Hart-Otis Car Co.

F. H. Hopkins & Co.

DYNAMO AND ELECTRIC CASTINGS

Dominion Brakeshoe Co.

ECONOMIZERS

Babcock & Wilcox

ELECTRIC CAR ROUTE SIGNS

Acton Burrows, Limited

Preston Car & Coach Co.

ENAMELED IRON SIGNS

Acton Burrows, Limited

ENGINEERS

Arnold Co.

Roberts & Schaefer Co.

Angus Sinclair & Co.

ENGINES, AUTOMATIC

Polson Iron Works

ENGINES, HOISTING

M. Beatty & Sons

Canadian Ingersoll-Rand Co.

F. H. Hopkins & Co.

Polson Iron Works

ENGINES, STATIONARY AND MARINE

Polson Iron Works

ENGINES, STEAM

F. H. Hopkins & Co.

EXPRESS OFFICE SIGNS

Acton Burrows, Limited

FARE BOX HOLDERS

Coleman Fare Box Co.

FARE BOXES, P.A.Y.E. OPERATION

Coleman Fare Box Co.

FILES

Nicholson File Co.

FORGINGS

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

FROGS

Canadian Ramapo Iron Works

Drew Electric & Mfg. Co.

GAUGE COCKS

Ohio Brass Co.

GAUGES, LOCOMOTIVE

Taylor & Arnold

GEARS AND PINIONS

Allen General Supplies, Ltd.

GRATES, SHAKING

Babcock & Wilcox

Polson Iron Works

HAMMERS, CAST STEEL

Dominion Brakeshoe Co.

F. H. Hopkins & Co.

HANDCARS

F. H. Hopkins & Co.

Rice Lewis & Sons

HANGERS, CABLE

Standard Und. Cable Co. of Can.

HEADLIGHTS

Ohio Brass Co.

HEATING, CAR

Chicago Car Heating Co.

Consolidated Car Heating Co.

HOISTS, PNEUMATIC

Taylor & Arnold

HOISTS, STEAM

M. Beatty & Sons

HOOKS

Steel Co. of Canada

HOPPERS, CAR, WET OR DRY

Duner Co.

ILLUSTRATIONS

Acton Burrows, Limited

INSPECTIONS

R. W. Hunt & Co.

INSULATORS, PORCELAIN

Drew Electric & Mfg. Co.

Ohio Brass Co.

INSURANCE, ACCIDENT

Imperial Guar. & Acc. Ins. Co.

INTERLOCKING PLANT AND SIGNALS

Canadian Steel Foundries, Ltd.

Gen. Railway Signal Co. of Can.

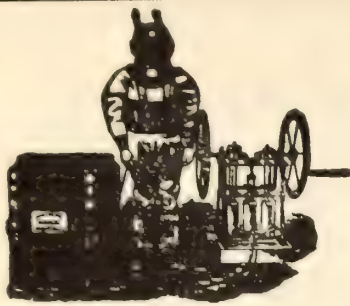
IRON AND STEEL BARS

Steel Co. of Canada

IRON SIGNS

Acton Burrows, Limited

IRON, PIG



JOHN DATE

Manufacturer of
Diving Apparatus

For Sale or Hire

Brass Founder and Coppersmith
13-15 Concord St., Montreal

Insist on having

DREWRY'S American STYLE RICE BEER

The best beer—
without exception

E. L. Drewry, Ltd., Winnipeg

Consolidated

The ORIGINAL electric heater.
Patented ventilated core. Glazed.
Patented return lead with connections at one end.
Light pressed steel construction.
Rust-proofed.
In use on 70,000 out of 90,000 cars now operating.

Consolidated Car-Heating Co.
New York — Albany — Chicago
DAWSON & CO., Agents, MONTREAL

FOR TICKET CASES AND COMMERCIAL FURNITURE

of all descriptions to stock
or special design, apply to
The Canadian Office and School Furniture Co.,
Limited
Preston Ontario

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Celebrated Wheel Truing Brake Shoe.
Best Wheel Grinders in the World.



"JUST as I told you—the right cement floor finisher would make our concrete floors wearproof, waterproof and oilproof. Now you see why I specified

**R.I.W. CEMENT FILLER
& CEMENT FLOOR PAINT**
REMEMBER ITS WATERPROOF
REG. U.S. PAT. OFF. PATENTED AS TO PORTLAND CEMENT FEB. 27, 1906

R. I. W. Cement Filler and Cement Floor Paint seal the sandy, porous surface of concrete and cement floors and in this way stop the constant sanding, water infiltration and the soaking up of oil. And it is so easy to apply—anybody can do it perfectly. Twelve standard decorative colors. A two-coat proposition that resists wear longer than anything else we have ever seen. Don't let "cement dust" fly as the floor scuffs off or sands. Stop it immediately with an application of these wonderful preservatives, and save your machinery and stock. Write for illustrated Booklet from Dept. 56.

Manufactured in Canada by

**R. I. W. DAMP-RESISTING PAINT CO.
TOCH BROTHERS**

Gerrard St. and Carlaw Ave.
TORONTO, ONTARIO, CANADA



Which Method

prevails in your plant? Does it take two men to do one man's work.

Why don't you replace that old antiquated tool with a new up to date

Reece's New Screw Plate

These pictures do not exaggerate conditions as you can actually see them, if you will visit Machine Shops throughout the country.

Lessen your cost by giving your mechanics a REECE'S NEW SCREW PLATE.

Butterfield & Co., Inc.
Rock Island, Que.

MANHOLE FRAMES & COVERS

Canada Iron Foundries
Dominion Brakeshoe Co.
MARINE PAINTS AND VARNISHES

Toch Bros.

MARINE REPAIRS

Goldschmidt Thermit Co.

MARINE SUPPLIES

Rice Lewis & Sons

METALS

Goldschmidt Thermit Co.

METAL WORK, STRUCTURAL

Canadian Bridge Co.

Dominion Bridge Co.

Jas. W. Pyke & Co.

MILEPOST NUMBERS

Acton Burrows, Limited

MONEL METAL

International Nickel Co.

MOTOR CARS

Fairmont Gas Engine and Ry.

Motor Car Co.

MOTORS, TURNTABLE

Taylor & Arnold

NAILS, CUT AND WIRE

Steel Co. of Canada

NICKEL, SHEET, ROD, WIRE & TUBE

International Nickel Co.

NUMBERS

Acton Burrows, Limited

NUT LOCKS

Positive Lock Washer Co.

OFFICE FITTINGS

Can. Office & School Furn. Co.

OFFICE SIGNS

Acton Burrows, Limited

OILS

Galena-Signal Oil Co.

PACKING

Canuck Supply Co.

Garlock Packing Co.

PAINTS

Toch Bros.

PATENT ATTORNEYS

H. J. S. Dennison

H. C. Shipman & Co.

PILE DRIVERS, RAILWAY

F. H. Hopkins & Co.

PIPE, STEAM

Babcock & Wilcox

PIPE STOCKS

Butterfield & Co.

PIPE, WROUGHT, LEAD AND GALVANIZED

Steel Co. of Canada

PLANERS

John Bertram & Sons Co.

Canada Machinery Corporation

PLATFORMS, STEEL

Standard Coupler Co.

PLOUGHS, CONTRACTORS'

F. H. Hopkins & Co.

PORTER

E. L. Drewry

PUMPS

F. H. Hopkins & Co.

PUMPS, CENTRIFUGAL

M. Beatty & Sons

F. H. Hopkins & Co.

R. D. Wood & Co.

PUNCHES AND SHEARS

Canada Machinery Corporation

PUTTY

Steel Co. of Canada

RAIL BONDS

Ohio Brass Co.

Elec. Railway Improvement Co.

RAIL BENDERS

Canadian Steel Foundries, Ltd.

RAIL JOINTS

Goldschmidt Thermit Co.

The Rail Joint Co. of Canada

RAILS, NEW

Algoma Steel Corporation

Dominion Iron & Steel Co.

J. J. Gartshore

F. H. Hopkins & Co.

RAILS FOR RELAYING

J. J. Gartshore

RAILWAY SUPPLIES

Franklin Railway Supply Co.

F. H. Hopkins & Co.

Rice Lewis & Son

The Hiram L. Piper Co.

REAMERS

Butterfield & Co.

REPLACERS, CAR AND LOCO-

MOTIVE

F. H. Hopkins & Co.

RIVETS

Steel Co. of Canada, Ltd.

RIVETTERS

Canadian Ingersoll-Rand Co.

ROCK CRUSHERS

F. H. Hopkins & Co.

ROPES, DERRICK

Dominion Wire Rope Co.

ROOFING, CAR

Franklin Railway Supply Co.

F. H. Hopkins & Co.

RUBBER GOODS

Can. Consolidated Rubber Co.

SANDERS, PNEUMATIC

Ohio Brass Co.

SAWS, HACK

Diamond Saw & Stamping Co.

SCOWS, DUMP AND DECK

M. Beatty & Sons

SCREW PLATES

Butterfield & Co.

SCRAPERS, WHEEL AND DRAG

F. H. Hopkins & Co.

SCREWS, WOOD AND MACHINE

John Morrow Screw and Nut Co.

SEMAPHORE ARMS

Steel Co. of Canada

SHEET PILE DRIVERS

Acton Burrows, Limited

Canadian Ingersoll-Rand Co.

SHIPS

Polson Iron Works

SIGNAL HOUSE NUMBERS

Acton Burrows, Limited

SIGNALS

Gen. Railway Signal Co. of Can.

The Hiram L. Piper Co.

SIGNS

Acton Burrows, Limited

SNOW PLOUGHS

F. H. Hopkins & Co.

SPIKES, RAILWAY, SHIP OR

PRESSED

Nova Scotia Steel and Coal Co.

Steel Co. of Canada

SPlicing TUBES AND COM-

POUNDS

Drew Electric & Mfg. Co.

Standard Und. Cable Co. of Can.

SPREADER CARS

F. H. Hopkins & Co.

SPRINGS

Canadian Steel Foundries, Ltd.

B. J. Coghlin & Co.

SPRINKLERS, ELECTRIC

Preston Car & Coach Co.

STAPLES

Steel Co. of Canada

STATION NAME SIGNS

Acton Burrows, Limited

STAYBOLT IRON

Taylor & Arnold

STAYBOLTS, FLEXIBLE

Flannery Bolt Co.

STAYBOLTS, LOCOMOTIVE

Flannery Bolt Co.

STAYBOLT TAPS

Butterfield & Co.

STEAM HAMMERS

John Bertram & Sons Co.

STEAM SHOVELS

M. Beatty & Sons

F. H. Hopkins & Co.

STEAMSHIP SIGNS

Acton Burrows, Limited

STEEL

Nova Scotia Steel and Coal Co.

STEEL FIRE BOX

Taylor & Arnold

Canadian Steel Foundries, Ltd.

STEEL FOR AXES

Canadian Steel Foundries, Ltd.

STEEL FOR SAWS

Canadian Steel Foundries, Ltd.

STEEL FOR TIRES

Steel Co. of Canada

STEEL SHAFTING

Nova Scotia Steel and Coal Co.

STEEL PLATES

Jas. W. Pyke & Co.

STEEL TOOL

Canadian Steel Foundries, Ltd.

STOKERS, MECHANICAL

Babcock & Wilcox

STRAINERS

Babcock & Wilcox

SUPERHEATERS

Babcock & Wilcox

Locomotive Superheater Co.

SWITCH TARGETS

Acton Burrows, Limited

SWITCHES

Canadian Ramapo Iron Works

TACKS

Steel Co. of Canada

TANKS AND TANK FIXTURES

F. H. Hopkins & Co.

Polson Iron Works

TAPS

Butterfield & Co.

TELEGRAPH AND TELEPHONE

OFFICE SIGNS

Acton Burrows, Limited

TERMINALS, JUNCTION BOXES

Standard Und. Cable Co. of Can.

THERMIT

Goldschmidt Thermit Co.

TIE PLATES

Algoma Steel Corporation

B. J. Coghlin

Nova Scotia Steel and Coal Co.

Steel Co. of Canada

TICKET CASES

Canadian Office & School Fur. Co.

TIRES, STEEL

Jas. W. Pyke & Co.

TOOLS AND SUPPLIES

F. H. Hopkins & Co.

Pratt & Whitney Co.

TOOLS, CAST STEEL

Dominion Brakeshoe Co.

TOOLS, TRACK

John Bertram & Sons Co.

Canadian Steel Foundries, Ltd.

B. J. Coghlin Co.

F. H. Hopkins & Co.

TOOLS, PNEUMATIC

Canadian Ingersoll-Rand Co.

Independent Pneumatic Tool Co.

TRAMWAY EQUIPMENT

J. J. Gartshore

TRACK EQUIPMENT

Canadian Ramapo Iron Works

F. H. Hopkins & Co.

TROLLEY BASES

Allen General Supplies, Ltd.

Ohio Brass Co.

Trolley Supply Co.

TROLLEY CATCHERS

Allen General Supplies, Ltd.

Ohio Brass Co.

Trolley Supply Co.

TROLLEY GUARDS

Ohio Brass Co.

Trolley Supply Co.

TROLLEY RETRIEVERS

Allen General Supplies, Ltd.

Ohio Brass Co.

Trolley Supply Co.

TROLLEY WHEELS

Star Brass Works

TRUCKS, ELECTRIC CAR

Canadian Steel Foundries, Ltd.

TRUSSES, ROOF

Canadian Bridge Co.

Dominion Bridge Co.

TUBES, BOILER

F. H. Hopkins & Co.

TUBE CLEANERS

F. H. Hopkins & Co.

TURNBUCKLES

Canadian Steel Foundries, Ltd.

TURNTABLES

Canadian Bridge Co.

Dominion Bridge Co.

UPHOLSTERY, CAR

Du Pont Fabrikoid Co.

VALVES

Canadian Detroit Lubricator Co.

R. D. Wood & Co.

VALVES, ANGLE AND GLOBE

Ohio Brass Co.

VALVES, BRASS GATE

Ohio Brass Co.

VALVES, LOCOMOTIVE POP

Taylor & Arnold

VARNISHES

Berry Bros.

VENTILATORS, CAR

Automatic Ventilator Co.

VESSELS

Polson Iron Works

WASHERS

Steel Co. of Canada

WASTE

B. J. Coghlin Co.

WATER SOFTENERS AND

PURIFIERS

Alphabetical List of Advertisers

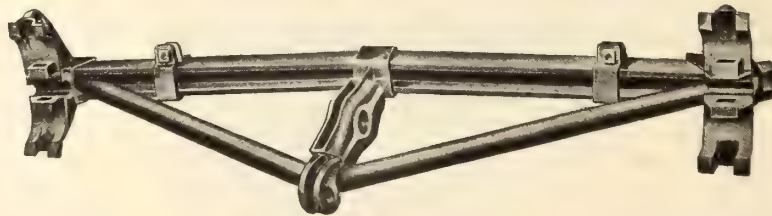
A		M	
Algoma Steel Corporation	24	Midland Dry Dock Co.	69
Allen General Supplies, Ltd.	80	Montreal Locomotive Works	14
Arnold Co.	79	Morrow, John, Screw & Nut Co. .	80
Association of Manufacturers of Chilled Car Wheels	11	N	
Automatic Ventilator Co.	24	National Steel Car Co.	86
B		Nicholson File Co.	21
Babcock & Wilcox	72	Norton, A. O., Inc.	15
Beatty, M. & Sons, Co.	70	Northern Electric Co.	73
Berry Bros. . .	21	Nova Scotia Steel & Coal Co. . .	4
Bertram, John & Sons, Co.	85	O	
Bradstreet Company	77	Ohio Brass Co.	13
Brown Hoisting Machinery Co. . .	7	Ottawa Car Manufacturing Co. .	78
Buffalo Brake Beam Co.	84	P	
Burrows—Acton Burrows, Ltd. . .	75	Pedlar People, Ltd.	16
Butterfield & Co.	82	Piper, The Hiram L., Co.	71
C		Polson Iron Works	18
Canada Iron Foundries, Ltd.	72	Positive Lock Washer Co.	78
Canada Machinery Corporation .	3	Pratt & Whitney Co. of Canada..	76
Canadian Brakeshoe Co.	79	Preston Car & Coach Co.	78
Canadian Bridge Co.	69	Pyke, J. W., & Co.	25
Canadian Bronze, Ltd.	77	R	
Canadian Consolidated Rubber Co.	26	Rail Joint Co. of Canada	22
Canadian Detroit Lubricator Co..	80	Roberts & Schaefer Co.	79
Canadian Fairbanks-Morse Co. . .	77	S	
Canadian Government Railways .	73	Shipman, Harold C., & Co.	79
Canadian Ingersoll-Rand Co.	15	Sinclair, Angus	79
Canadian Marconi Co.	73	Standard Coupler Co.	78
Canadian National Carbon Co. . .	23	Standard Underground Cable Co.	
Canadian Northern Railway	13	of Canada	77
Canadian Office & School Furni- ture Co.	82	Star Brass Works	72
Canadian Pacific Railway	79	Steel Co. of Canada	8
Canadian Ramapo Iron Works ..	73	Steel Equipment Co.	20
Canadian Steel Foundries, Ltd. . .	19	T	
Canadian Westinghouse Co.	2	Taylor & Arnold	25
Canuck Supply Co.	6	Terry & Tench Co.	79
Carter White Lead Co.	18	Toch Bros. . .	82
Chicago Car Heating Co.	78	Trolley Supply Co.	25
Coghlin, B. J., Co.	1	W	
Consolidated Car Heating Co. . .	82	Wood, R. D., & Co.	71
D		*Advertisements marked with an asterisk appear in alternate issues.	
Date, John	82		
Dearborn Chemical Co. of Canada	14		
Dennison, H. J. S.	79		
Diamond Saw & Stamping Works	74		
Dominion Brakeshoe Co.		74	
Dominion Bridge Co.		75	
Dominion Iron & Steel Co.		23	
Dominion Iron & Wrecking Co. .		23	
Dominion Steel Foundry Co.		71	
Dominion Wire Rope Co.		12	
Drew Electric & Mfg. Co.		83	
Drewery, E. L., Ltd.		82	
Duner Co.		71	
Du Pont Fabrikoid Co.		2	
E			
Eastern Car Co.		5	
Electric Railway Improvement Co.		22	
F			
Fairmont Gas Engine & Ry. Mo- tor Car Co.		80	
Flannery Bolt Co.		17	
Franklin Railway Supply Co. . .		16	
G			
Galena-Signal Oil Co.		9	
Garlock Packing Co.		20	
Gartshore, J. J.		79	
General Ry. Signal Co. of Canada		10	
Goldschmidt Thermit Co.		17	
Grand Trunk Railway		19	
Griffin & Brinkerhoff		82	
H			
Hart-Otis Car Co.		12	
Hopkins, F. H. & Co.		12	
Hunt, Robert W., & Co.		79	
Hunt-Spiller Mfg. Corporation. .		75	
I			
Imperial Bank of Canada		77	
*Imperial Guar. & Acc. Ins. Co. .		—	
Independent Pneumatic Tool Co. .		74	
International Correspond. Schools		76	
International Nickel Co.		77	
J			
Joliette Steel Co.		76	
L			
L'Air Liquide Society		70	
Lewis, Rice, & Son		22	
Locomotive Superheater Co.		24	

Buffalo Brake Beam Company

BUFFALO BEAMS ARE BEST BEAMS

Offices:

NEW YORK
30 Pine Street
ST. LOUIS
Syndicate Trust Bldg.
MONTREAL
195 Commissioner St.



Works:
BUFFALO,
N.Y.

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment



We offer for immediate shipment :

6—32 in. x 14 ft. Bertram Double Back Geared
Quick Change Engine Lathes.

Also 250 lb., 350 lb., 600 lb. and 2000 lb. Single
Frame Steam Hammers.

1½-in. and 2-in. Acme Single Bolt Cutters.
and 1½-in. and 2-in. Acme Double Bolt Cutters.

**THESE MACHINES ARE ALL IN STOCK
READY FOR SHIPMENT.**

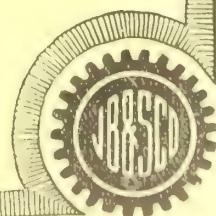
**The John Bertram & Sons Company
Limited**

Dundas, Ontario, Canada

MONTREAL
723 Drummond Bldg.

VANCOUVER
609 Bank of Ottawa Bldg.

WINNIPEG
1205 McArthur Bldg.





National Railroad Equipment

Designed, Built and Equipped in our Own Plant.

All Steel Sleeping Cars, Freight Cars, First-class Passenger Coaches, Oil Tank Cars, Contractors Dump Cars, Underframes, "Damascus" Brake Beams, Flat Cars, National Motor Trucks for light and heavy duty, Railroad Equipment of Special Design built to Order.

Correspondence Invited

National Steel Car Company, Limited

Montreal Office :
SHAUGHNESSY BUILDING

Works and Operating Offices :
HAMILTON, CANADA

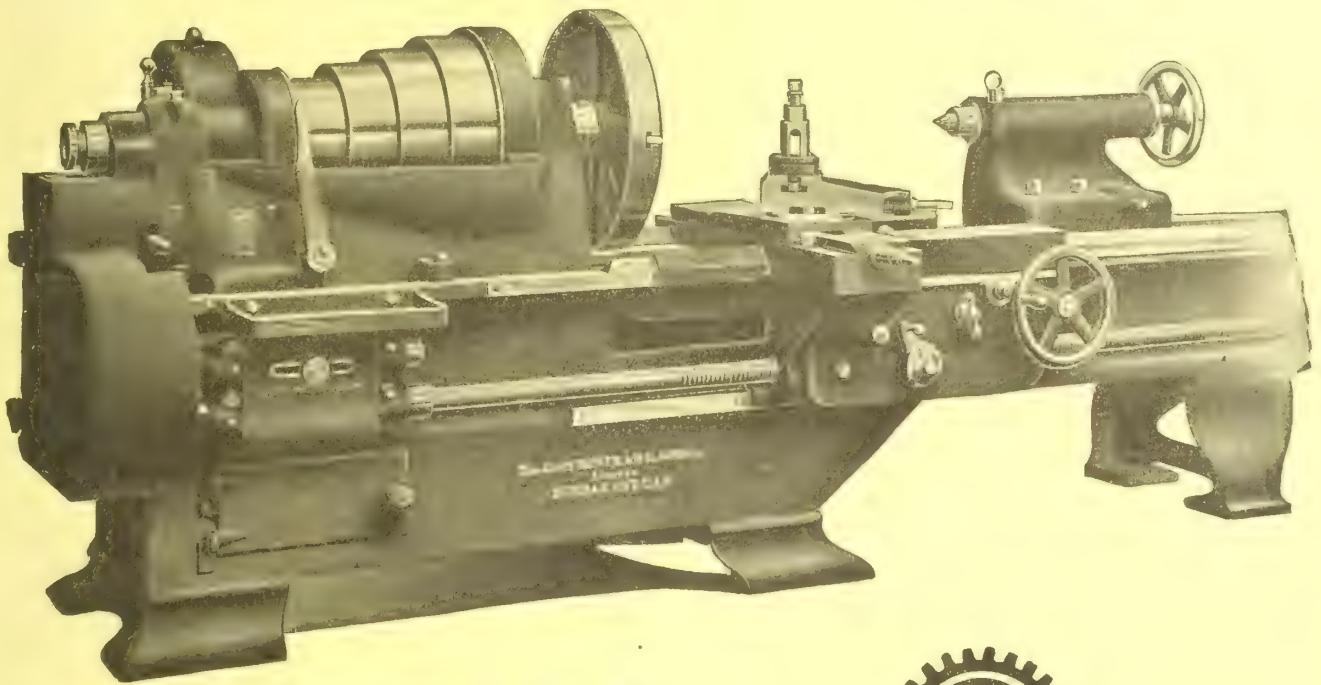
Canadian Railway AND Marine World

ESTABLISHED 1898.

Number 226

TORONTO, CANADA, DECEMBER, 1916

Subscription Rates, Page 495



BERTRAM

MACHINE
TOOLS



are built for safety and service, and are backed by a concern with sixty years' experience and the largest of its kind in Canada. The convenience, accuracy and long service of Bertram Machine tools proves invaluable to every user.

Double Back-Geared Gap Lathe
27-inch x 42-inch Swing

This is a "Safety First" Machine, one that protects your employees against accidents and your plant against resultant damages.

The John Bertram & Sons Co., Limited

DUNDAS, ONTARIO, CANADA

MONTREAL
723 Drummond Bldg.

VANCOUVER
609 Bank of Ottawa Bldg.

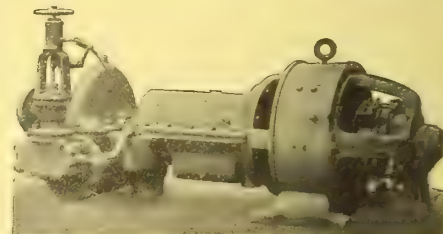
WINNIPEG
1205 McArthur Bldg.

Westinghouse

Geared-Turbo Marine Lighting Sets

A distinct advance in the building of small direct-current units.

The units are self-contained and very compact. No expensive foundations are required. The lubricating system is entirely automatic and needs but infrequent attention, as there are no oil or grease cups to be filled. The amount of oil used is but a fractional part of that required by a reciprocating engine of equal capacity. The simple design and construction insures thorough reliability and long life.



Canadian Westinghouse Company, Limited, Hamilton, Ontario

TORONTO, Traders Bank Bldg. MONTREAL, 52 Victoria Sq. OTTAWA, Ahearn & Soper, Ltd. HALIFAX, 105 Hollis St. FT. WILLIAM, Telfer Bldg.
WINNIPEG, 158 Portage Ave. E. CALGARY, Grain Exchange Bldg. VANCOUVER, Bank of Ottawa Bldg. EDMONTON, 211 McLeod Bldg.



Superintendents of Motive Power, Fuel Agents, Officials in Charge of Operation

Should investigate the merits of the Dearborn Method of Water Treatment.

It is inexpensive—costs less than any other method.

It is effective—the waters requiring treatment are analyzed, and the treatment made to meet the actual requirements.

It accomplishes—the removal and prevention of scale—stops leaks—prevents corrosion—overcomes all foaming trouble.

The benefits—life of boiler tubes greatly lengthened—expense for boiler work reduced to minimum—mileage between boiler washings increased—large saving in fuel effected by having boilers free from scale. All the troubles due to bad water overcome and service generally improved.

Experts furnished to instruct in application of treatment.

Now used on more than 100 American railways.

Dearborn Chemical Company of Canada, Limited

Office and Works: 1220-1230 Dundas Street, Toronto, Canada

Nothing New

Supt.—What's this? Another requisition for valve discs?

Foreman—Yes sir—

Supt.—The last time we ordered valve discs I thought I got enough to keep us in discs till "Dooms Day" and "here we are again"—Were the last lot stolen?

Foreman—No sir—just used up—they don't seem to last. I ran across some Anchorite Discs a while ago and got two for test—they have lasted two and a half times as long as those we have been using and are still in—the test isn't finished yet but I'd like to see a few more of those Anchorite Discs if we can afford them.

Supt.—Well—they do cost more but I'm sick of passing requisitions for discs every month so we will get Anchorite Discs hereafter and get this disc trouble wiped off the slate.



CANUCK SUPPLY CO.

LIMITED

Montreal
Que.

Toronto
Ont.

Winnipeg
Man.

Vancouver
B.C.

Saving \$5.87 in One Half Hour's Time

THAT is exactly the saving effected by a 15 ton Brownhoist in one half hour's time in the shop yards of a large middle western shop, loading car wheels.

At $17\frac{1}{2}$ cents an hour, hand labor may seem cheaper to use. That is what the railroad that is now using this Brownhoist used to think. On this road, loading a car with 115 car wheels, averaging 800 lbs. each, used to take 4 men, at $17\frac{1}{2}$ cents an hour, *nine hours* to load a car from a car floor height platform.

Today, this railroad by using a 15 ton Brownhoist completes this job in exactly 30 minutes, at an operating cost of \$.43.

Equipped with a lifting magnet, six wheels are lifted at a time, and the operative speed of the Brownhoist, together with its safety features, make this saving possible.

This is but one of the many jobs this railroad has effected a big saving on, by using the Brownhoist.

Our new catalog I on "Locomotive Cranes," illustrates many time and labor saving jobs performed by Brownhoists on railway work. Write for your copy.

The Brown Hoisting Machinery Co.

Cleveland, Ohio, U. S. A.

Montreal Office: 145 St. James St.

Engineers and Manufacturers of Cranes and Hoists



**Quality****Service**

Courtesy in Business



Fittingly framed and hanging in the Offices of one of the most important Public Service Corporations on this North American Continent is the following

'Did you say Please and Thank you?'

Broad minded men direct the destiny of that Corporation, men who know that public or private enterprises to be lastingly successful must operate for the public good.

Quality and Service are the two important factors in our business life today, but Courtesy is the door through which they must enter.

We are large producers of Hamilton Pig Iron and our output of Open Hearth Steel Blooms and Billets, Iron and Steel Bars of all shapes and size runs into enormous tonnage.

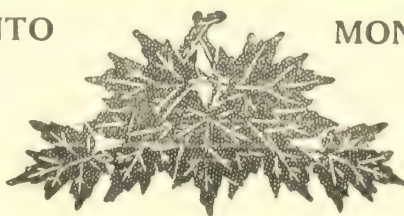
The products of our mills include practically everything that can be manufactured from Iron and Steel and these we distribute to thousands of satisfied customers.

Our business is an extensive one and a successful one. The World is our market: but our prosperity and success in the future, as in the past, depend upon the continued confidence, co-operation and good-will of the people we serve.

The Steel Company of Canada, Limited

HAMILTON TORONTO

MONTREAL WINNIPEG



GALENA OILS

HAVE NO EQUAL IN
QUALITY, EFFICIENCY and ECONOMY

SOLE MANUFACTURERS OF
Celebrated Galena Coach, Engine and Car Oils
LUBRICATION ON A GUARANTEED BASIS

ELECTRIC RAILWAY LUBRICATION
A SPECIALTY

Perfection Valve and Signal Oils

Galena Railway Safety Oil—Made especially for use in headlights, marker and classification lamps.

Galena Long Time Burner Oil—For use in switch and semaphore lamps, and all lamps for long time burning, avoiding smoked and cracked chimneys and crusted wicks.

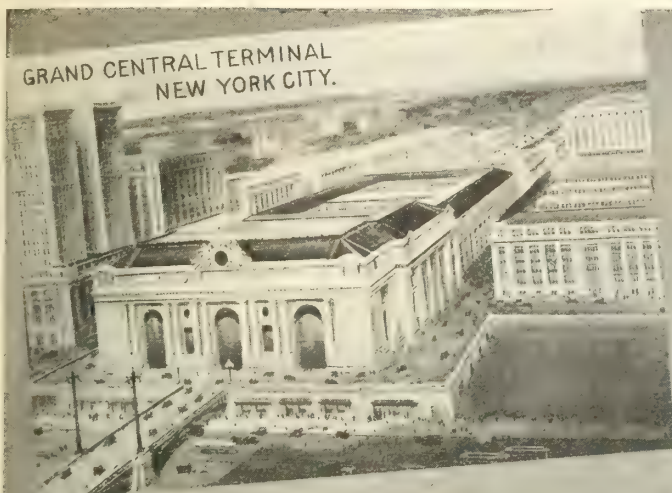
TESTS AND CORRESPONDENCE SOLICITED

Galena Signal Oil Company

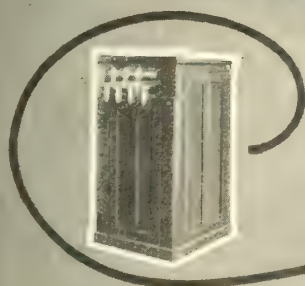
Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.

GRAND CENTRAL TERMINAL
NEW YORK CITY.C.&N.W. TERMINAL
CHICAGO.

From the Smallest to the Largest
Power Interlocking in the world is



GRS Dynamic Indication Electric Interlocking

C.&N.W.R.Y.



The same parts, the same principles, the same simplicity and the same 100% protection is embodied in all machines from 4 to 400 levers. G. R. S. Electric Interlocking is far safer than the most complete mechanical plant and is adaptable to any size interlocking.

N.Y.C.&H.R.R.R.

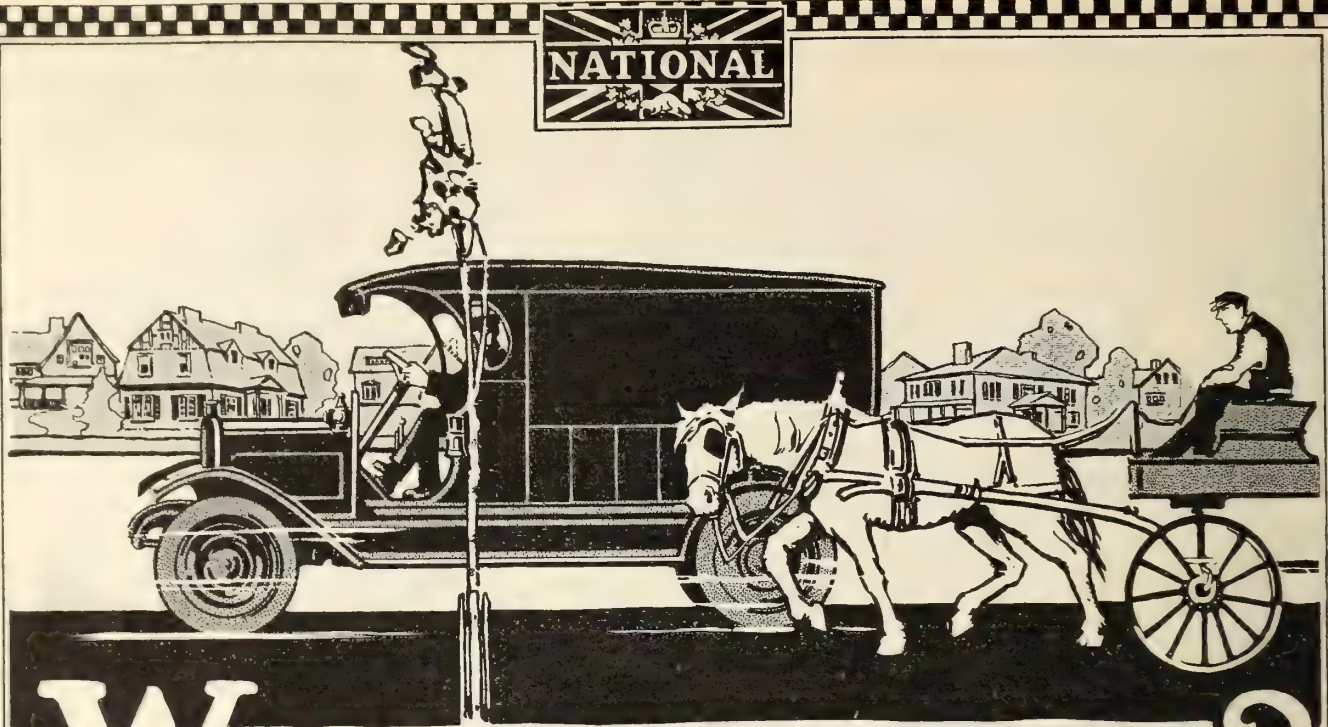


"Safety First"
GENERAL RAILWAY SIGNAL COMPANY
OF CANADA LIMITED



Office and Works, Lachine, Quebec

Branch Office, Winnipeg, Manitoba



Which is your Choice?

IF you could cut six men off your pay roll, or get one man to do the work of six, you would not hesitate in putting into effect a new system that would get this result, would you?

National Motor Trucks are increasing the efficiency of delivery systems in that ratio—6 to 1—for Railroads, Express Companies, Manufacturers, Lumber Yards and many other trades.

One big Manufacturer is making 150 calls a day with a National One-ton Truck. Every day you can see this Master Truck delivering its loads quickly, quietly and economically. The Shipping Department Schedule is always up-to-the-minute. No delays, not a cent spent for repairs since the Truck started to work—six months ago.

National Traffic Experts have a message for you. A message that will save time and money in Your Delivery Department. Write us a letter or telephone your enquiry. We will call. No obligation if you do not want to go further—after you have heard our presentation of Motor Truck facts.

Address: Motor Truck Dept.

National Steel Car Company
Limited

Montreal Office
Shaughnessy Bldg.

Operating Office and Works
Hamilton, Canada



NORTHERN Electric Railway Signal Wire is designed, manufactured and tested to maintain the highest possible factor of safety. In every phase of its production, engineering skill of the highest order directs its manufacture.

To those interested we will be glad to send a list of the larger users of this class of wire who will verify our claims for Northern Electric Railway Signal Wire.

Northern Electric R.S.A. Wire meets with the R.S.A. specifications in every particular and goes a step further—it meets the more rigid Northern Electric specifications which gives you, the user, double protection.

Enquiries as to specifications and prices are welcomed at any of our Branch Houses.

Manufacturers of

Armored Cables for bridge installations.
Asbestos Insulated Wire for Headlights.

Bare Weatherproof and Paper Insulated
Feeder Cables.

Bare Wires for Train Dispatching.

Bonding Cables.

Car Wire for Electric light, fan, annunciator, motor and control circuits.

Magnet wire for rewinding motors.

Paper-Insulated, Lead Covered Telephone Cables.

Paper-Insulated and Rubber Insulated
Telegraph Cables.

Railway Signal Wire, bare and rubbered covered.

Reinforced Weatherproof Cables and
Armored Cables for use in car shops.

Rubber Covered Wire for round houses
and repair shops.

Trolley Wire.

WIRES & CABLES

Northern Electric Company
LIMITED

Montreal

Ottawa

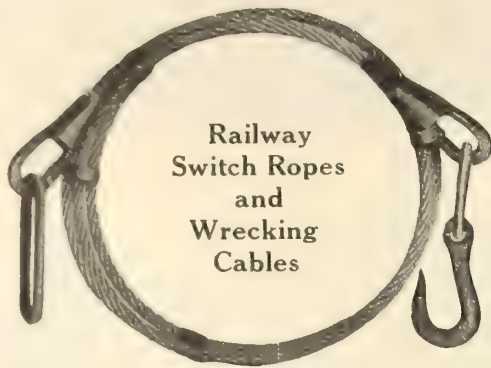
Winnipeg

Halifax

Toronto

Regina

Calgary Vancouver



SAFETY FIRST

Use

"DOMINION" Wire Rope

Tough — Strong — Durable

The DOMINION WIRE ROPE Co., Limited

Montreal

Winnipeg

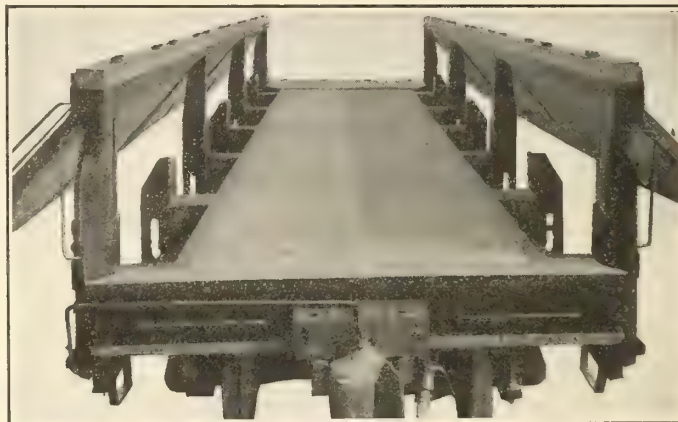
Toronto

Side Ballasting With One Side Closed**The Latest in Ballast Cars**

33 $\frac{1}{3}$ % More Door
Opening Area.

Less Stakes to
Obstruct the
Dumping Material.

No Clogging of the
Material or
Boulders between
the Plow and
Stakes.

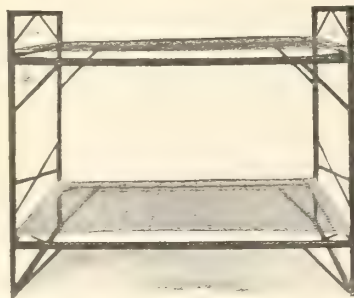


Dumps Clean and
Quicker in any
Material.

No More Breaking
of Stakes or Cables.

The Car that will
give Maximum
Service with
Minimum Repairs.

—DESIGNED, BUILT AND PATENTED IN CANADA—

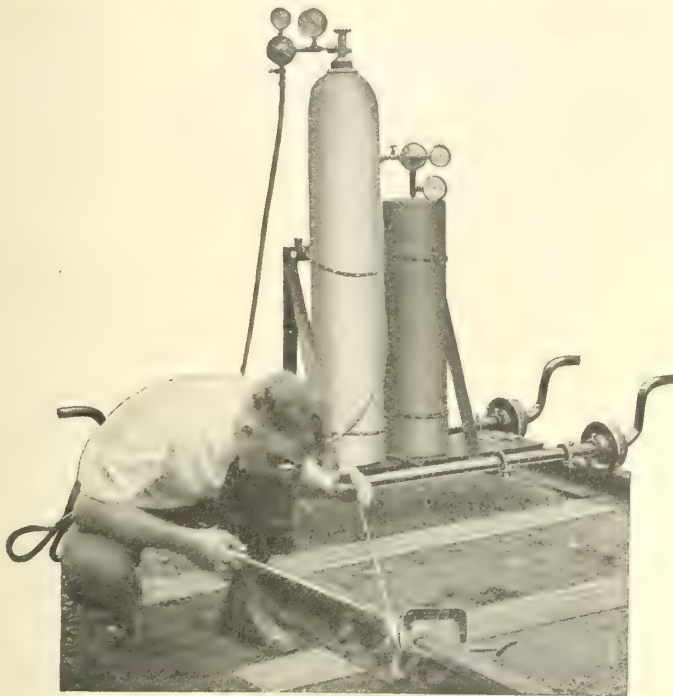
The HART-OTIS CAR CO., Limited, MONTREAL**"TIGER" Steel Bunks****"KING BEE" Gasoline Lights****SNOW
PLOWS****Excavating Machinery of
Every Description**

Branch:
108 Mail Building
TORONTO

F.H. Hopkins & Co

Head Office:
MONTREAL

Extraordinary Results With Ordinary Means



Though the equipment is inexpensive, though unskilled labor can do the work, though working conditions be far from ideal, still O-B Gas-Weld Bonds are high in efficiency.

The O-B G. W. Bond really becomes a part of the rail. The contact does not deteriorate either mechanically or electrically.

And the Bond itself is long-lived under strain.

Send for full details about O-B Gas-Weld Bonds.

The Ohio Brass Company
MANSFIELD, OHIO

"Maximum Power at Minimum Cost"

The Short Belt Drive attachment when used on



Ingersoll-Rand Air Compressors

solve the space problem,—in fact all of our compressors whether power or steam-driven require very little space for the results obtained.

Write us for any information.

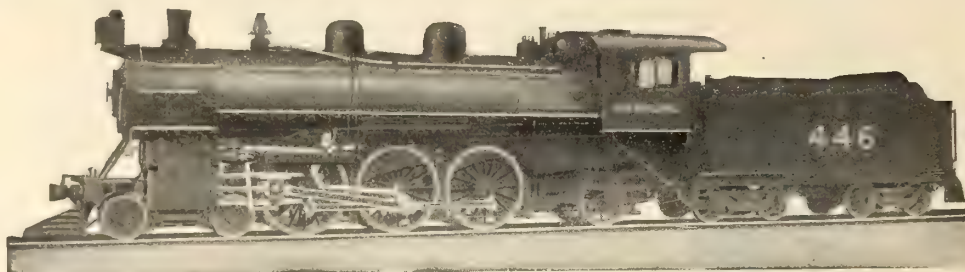
Canadian Ingersoll-Rand Co., Limited

Commercial Union Bldg., MONTREAL, CANADA

Works: SHERBROOKE, QUE.

SYDNEY TORONTO COBALT TIMMINS WINNIPEG NELSON VANCOUVER

Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE—INTERCOLONIAL RAILWAY

Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

Montreal Locomotive Works, Limited


DOMINION EXPRESS BUILDING, MONTREAL, CANADA

Accept the Opinion of Canada's Greatest Railroads

WHEN it comes to a question of Culvert selection where so much depends on experience and test, you can't do better than accept the opinion of Canada's greatest Steam and Electric Railways. Most of them give pointed approval to

Pedlar's "Perfect" Culverts

by continuing to use them whenever the need of a culvert appears. For Pedlar's Culverts give the utmost in strength and endurance and ask the least in maintenance cost. As a matter of fact there is no maintenance cost with a Pedlar Culvert, for Pedlar's Culverts will withstand the rough usage and vibration of ordinary roads for generations without the sign of deterioration or wear.

Pedlar's "Perfect" Culverts are made of anti-corrosive  that cannot crack, rust or corrode and are unaffected by frost and climatic conditions.

Shipped in sizes and lengths to suit any road requirements. The Complete Culvert Reference book No. 4 R.M. full of important data and drainage tables is free for the asking. Write for it today.



THE PEDLAR PEOPLE, Limited

(ESTABLISHED 1861)

Executive Office and Factories, OSHAWA, ONT.

Branches :

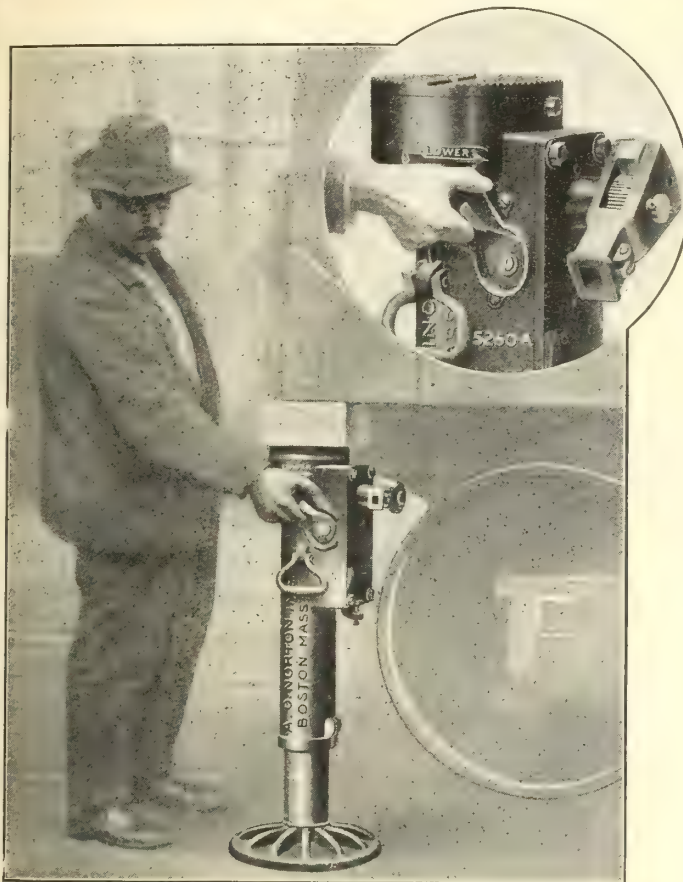
MONTREAL

OTTAWA

TORONTO

LONDON

WINNIPEG



Don't Pump Your Jack Down

Lower the Load by "Pressing the Button"

The Norton Self Lowering Jack

is absolutely Safe and will do your work **Quicker** and **Easier** than you have ever done it before.

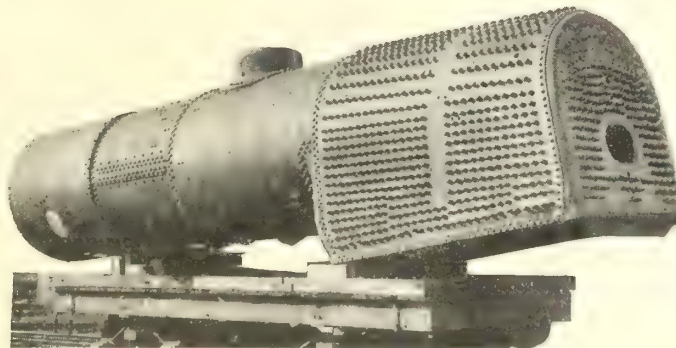
Send for Illustrated Catalogue No. 28.

A. O. Norton, Limited

Coaticook, Prov. Que., Canada

Stock Carried by Canadian Agents:
MUSSENS LIMITED

Montreal Toronto Winnipeg Cobalt Calgary
Vancouver



It is an Established Fact

That fireboxes of all types equipped with the Tate Flexible Staybolt show the lowest maintenance cost and highest earnings.

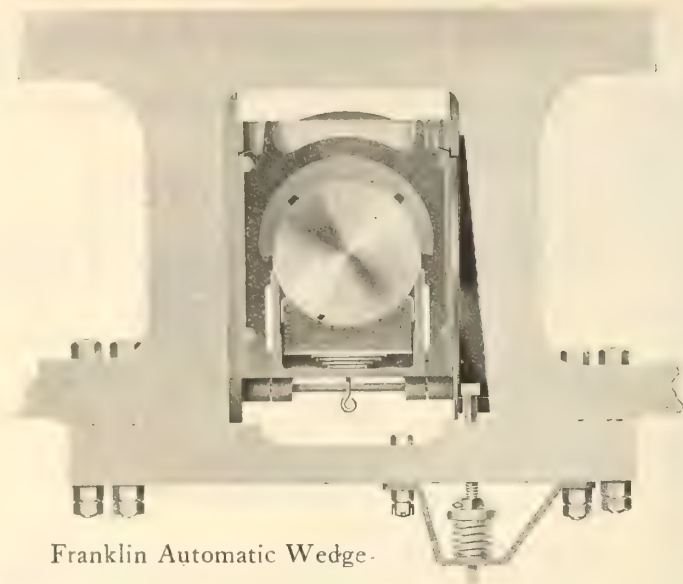
The Flexibility in the bolt serves to accomodate the relative expansion of plates under working operations of the fire box and boiler in a manner that has afforded less destruction to the sheets and seams than were found under conditions where fireboxes were rigidly stayed.

The Tate Flexible Staybolt is designed and made to give satisfactory results in the final measure of its usefulness, as an economic, safe and reliable factor in reducing the costs of firebox repairs and maintenance.

In use on all the prominent railroad systems of Canada.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.



Franklin Automatic Wedge.

Franklin Automatic Adjustable Wedge

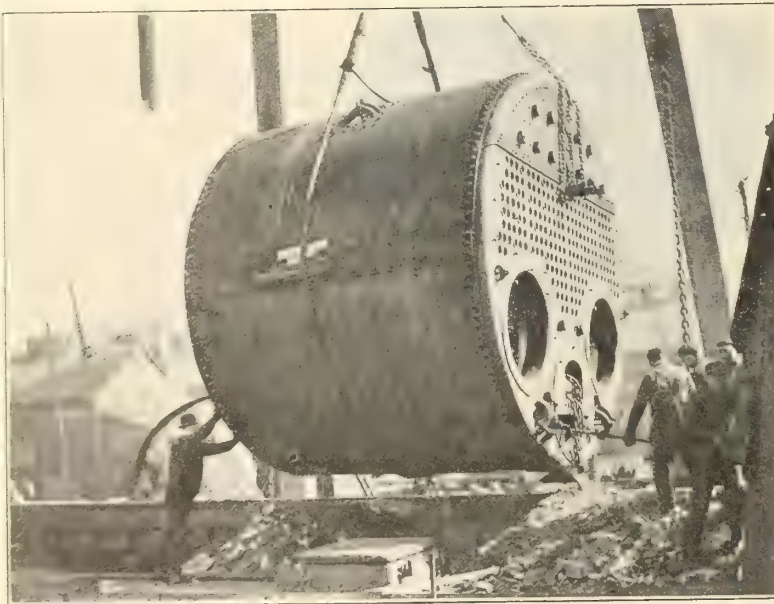
Automatically eliminates pounds in driving boxes. This prevents one loose box from starting others. It reduces wear and tear and keeps knocks out of rods, bushings and pins. The automatic adjustment prolongs the periods between shoppings.

Franklin Railway Supply Company

30 CHURCH STREET, NEW YORK

332 So. Michigan Ave.
CHICAGO

625 Transportation Bldg.
MONTREAL



13 ft. x 11 ft. Clyde Boiler for Senator Derbyshire, weight 30 tons. Designed for a working pressure of 125 lbs., but allowed 131 lbs. by the Government Marine Inspector. This boiler has 212 tubes, including stay tubes $3\frac{1}{2}$ inches diam. x 7 ft. 9 ins. long, three Morrison corrugated flanged furnaces of the "horse collar" withdrawal type, grates and smoke box. The steamer was laid under our shear leg at the close of navigation and the old boiler removed. Within 10 hours after the breaking up of the ice in our dock the new boiler was installed in the boat.

Steel Shipbuilders Engineers and Boilermakers

Dredges, Hydraulic and Dipper Type; Steel Steamers, full Canal Size; Tugs, Barges and Scows

Marine Engines and Boilers, all Sizes

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto

RESULTS COUNT

That's Why 480 Railroad Shops Are Using Thermit

Thermit offers the only sure and reliable repair for locomotive frames and other heavy sections.

The superheated liquid Thermit steel is produced in bulk and poured all at once into a mold surrounding a broken section, resulting in the perfect amalgamation of the Thermit steel with the parts with which it comes in contact. The fact that those parts are first preheated, makes the weld doubly sure.

The operation of welding locomotive frames is easily accomplished, without removing the frame from position, and with very little dismantling, no matter if the frame be broken in the splice, jaw, next to the cylinder saddle, or at any other point. The engine is returned to service in from ten to twelve hours.

Hundreds of thousands of pounds of Thermit are being used annually by railroad companies in the United States and Canada.

There is only one reason for this, and that is that Thermit produces results and we all know that "results count."

Our pamphlet No. 2144 will be of interest.

All Thermit and Thermit appliances are made in our Canadian shops.

GOLDSCHMIDT THERMIT COMPANY

103 Richmond St., W., Toronto, Ont.

329-333 Folsom St., San Francisco. Equitable Bldg., 120 Broadway, New York

7300 So. Chicago Ave., Chicago



THE DOUBLE TRACK ROUTE

WINTER TOURS to CALIFORNIA AND ALL PACIFIC COAST POINTS, FLORIDA, TEXAS, NEW ORLEANS, ETC.

Winter Tours Tickets now on sale. Stop over privilege allowed.

Apply to any Agent of the Company for particulars.

G. T. BELL,
Passenger Traffic Manager,
MONTREAL

W. S. COOKSON,
General Passenger Agent,
MONTREAL



If You Want the Highest Standard Quality Dry Lead

—the kind that is the best for every purpose for which a dry lead is used—the kind that is absolutely guaranteed for protecting all styles of metal construction that is subject to rust or corrosion,

MAKE YOUR NEXT ORDER

CARTER'S DRY RED LEAD

We make Orange Lead and Litharge. Special Red Lead and Litharge for Color, Varnish and Rubber making. Oxides for Potters and Storage Battery makers. Our products are wholly Canadian made and equal in quality to the best imported goods.

Send a post card for prices.

THE CARTER WHITE LEAD COMPANY of Canada, Limited
91 Delorimier Avenue, MONTREAL

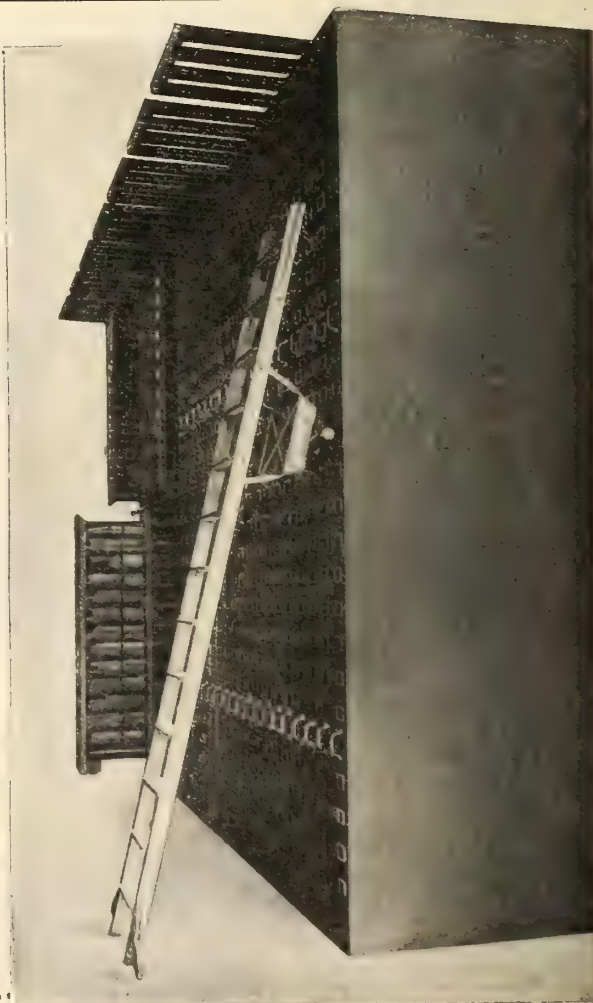
The Planfile

STEEL sections for rolled plans, especially adapted for railroad plans. Each compartment holding complete sets of blue prints or tracing of any subject, every plan in plain sight for instant reference.

The Steel Equipment Co., Ltd.
Ottawa, Ont.

FACTORY AT PEMBROKE.

Complete information sent on request.

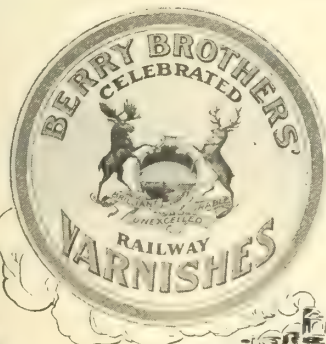


CANADIAN STEEL FOUNDRIES LIMITED

STEEL CASTINGS - MANGANESE STEEL CASTINGS
GRAY IRON AND SEMI STEEL CASTINGS - BAR STEEL
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK

GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
LONDON (ENG) OFFICE —
— TRAFALGAR HOUSE, WATERLOO PLACE.

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL



Appearance is an Outward Sign of Prosperity

Everybody forms a COMMERCIAL RATING of everybody else by APPEARANCES. It is ASSUMED that people who DO WELL will want to surround themselves with things that LOOK GOOD. This is what WE expect in OTHERS. Why should they not expect it of us? A small investment in DURABLE APPEARANCE—the kind that does not need attention again for a long time—is GETTING THE MOST OUT OF MONEY.

Berry Brothers' Railway Varnishes

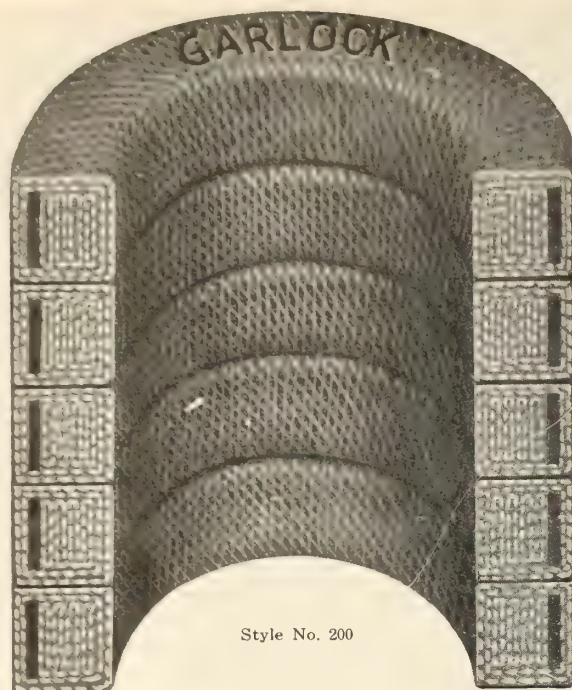
Need no introduction to experienced railway men. For nearly 60 years they have been the standard of railway varnish quality and their constantly increasing sale is undisputable testimony of their great efficiency.

If you have not already received a copy of our new catalog of Railway Varnishes, write us today, for the best catalog of its kind ever published.

BERRY BROTHERS
(INCORPORATED)
World's Largest Varnish Makers

WALKERVILLE

ONTARIO



Style No. 200

Garlock High Pressure Piston Rod Packing

Is built up in rectangular form and uniform shape and exact sizes are thereby obtained.

Asbestos packing, which is rolled around a rubber core and afterwards distorted by running through a square die, does not retain its shape or size.

The best materials we can buy are used in the manufacture of our high pressure packing.

The length of service obtained from it is greater than that secured from other makes, therefore the labor cost of applying and adjusting is less.

Our packings are sold at net weights; weights of tubes and boxes are not included.

Every pound of our high pressure packing carries with it the Garlock guarantee of satisfactory and economical service.

We will promptly replace or refund the cost of any of our packings which may prove unsatisfactory to our customers.

THE GARLOCK PACKING COMPANY

- Hamilton, Ontario



Branches :

Montreal, Que., 342 St. James St. East Toronto, Ont., Continental Life Bldg.
Winnipeg, Man., Galt Building



Midland Dry Dock Co., Limited

JAMES WILKINSON, Manager

BUILDERS OF

**STEEL TUGS, SCOWS AND
DREDGE HULLS**

Special Attention Given to all kinds of Hull Repairing.

Steel and Wood Plant Operated by
Hydro-Electric Power. Always Ready.

Midland, Ont.

Day Telephone 258.

Night Telephones 254 and 348.

50
YEARS
IN THE
BUSINESS

It Is Not Without Reason That They Are Called The "Famous Five" Files

—The steel in them is made to our own formulas.

The teeth are cut by ingenious machinery, designed and patented by us.

And only the highest type of skilled labor is used in manufacturing them.

Consequently, they give satisfaction wherever used.

Specify them when you order.

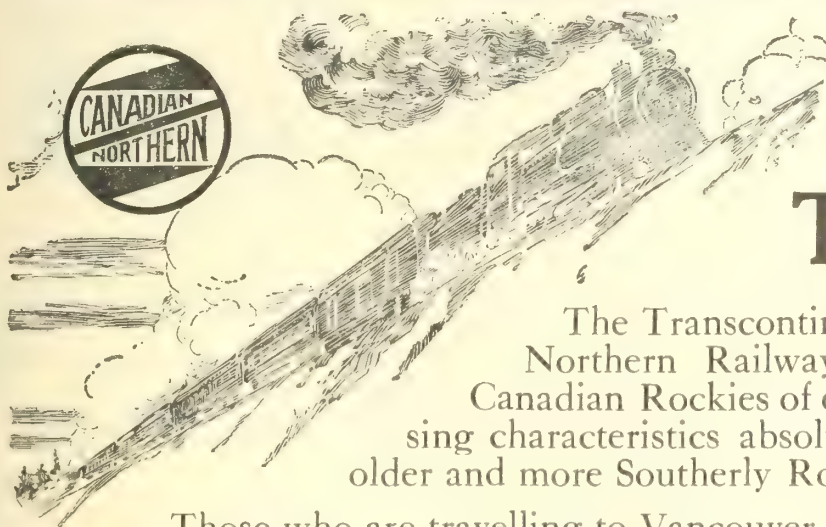
**Kearney & Foot—Great Western
American—Arcade—Globe**

(Made in Canada)

The Nicholson File Company

PORT HOPE *(Dealers Everywhere)* ONTARIO

OVER
60,000,000
FILES
A YEAR



Re-Discover The Rockies

The Transcontinental Line of the Canadian Northern Railway traverses a Section of the Canadian Rockies of exceptional grandeur, possessing characteristics absolutely distinct from those of older and more Southerly Routes.

Those who are travelling to Vancouver, whether on business or for pleasure, will find themselves well repaid for their Patronage of our Line, by the opportunity of traversing a new Section of Canada, and of recovering that thrill aroused by their first glimpse of towering Snow-Capped Peaks and Rugged Canyons.

For Literature and information apply to General Passenger Dept., 68 King St. E., Toronto, Ont., 226 St. James St., Montreal, Que., or Union Station, Winnipeg, Man.

Travel Canadian Northern all the Way

The Parmelee Pipe Wrench



Price List C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths
10 in.	1	3/8, 1/2, 3/4, 1 in.	\$5.00	\$2.25	3/8, 1/2, 3/4, 1 in. \$.75
20 in.	2 1/2	3/4, 1, 1 1/4, 1 1/2, 2 in.	7.50	2.50	3/4, 1, 1 1/4 in. 1.00 1 1/2, 2 in. 1.25
25 in.	3 1/2	1 1/2, 2, 2 1/2, 3 in.	7.50	3.00	1 1/2, 2, 2 1/2, 3 in. 1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Limited

Toronto, Canada

"The Toothless Wonder"

Designed Especially to handle pipes spaced closely as in coil work. No. 2 1/2 wrench illustrated requires but three-quarter inch space between pipes.

Positive Grip instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

Ratchet-like Action. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

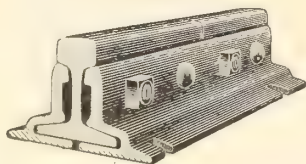
Can't Chew. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

Can't Crush. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.

The Rail Joint Company of Canada, Limited

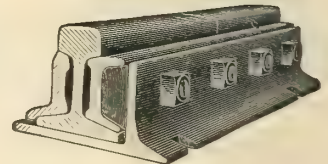
McGill Bldg., MONTREAL

36 Broad Street, London, E.C.

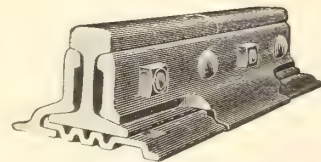


CONTINUOUS

Continuous,
Weber, Wolhaupter and
100 p.c. Rail Joints.



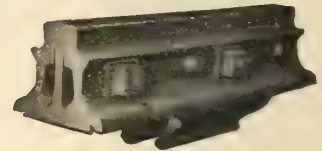
WEBER



WOLHAUPTER

Standard—Insulated
Step—Frog and Switch
Protected by Patents.

Grand Prize, San Francisco, 1915.



100 p.c.

Dominion Iron & Wrecking Company LIMITED

Railway Equipment, Rails and Machinery

Dismantlers of BRIDGES, PLANTS, STEAMERS, MILLS
Dealers in IRON, STEEL, SCRAP METALS

General Offices: Transportation Building

QUEBEC

MONTREAL, QUE.

ST. JOHN, N.B.

Dominion Iron & Steel Co., Limited

Manufacturers of

Basic Open Hearth Steel Rails

We will be pleased to have your enquiries for 1916 shipments

Head Offices
and Works

Sydney, Cape Breton, Canada



No Loose Battery Connections

The Columbia Hot Shot Battery is the last word in railway motor car ignition. By its use all chances of loose battery connections are eliminated.

Instead of a number of dry cells wired up in haphazard fashion you have a compact, weatherproof battery with but two binding posts. All connections are permanently soldered in place making loose connections impossible.

Columbia Hot Shot Batteries are made in several sizes and voltages. We will be glad to send descriptive literature on request.

Canadian National Carbon Company, Limited

265 Adelaide Street West

Toronto, Ontario

ALGOMA STEEL CORPORATION LIMITED

STEEL RAILS
PLICE BARS
STEEL TIE PLATES

PIG IRON
BASIC & BESSEMER



STRUCTURAL SHAPES
STANDARD MERCHANT
BARS

BLOOMS BILLETS
& SLABS

SAULT STE. MARIE, ONT. CANADA.

Are You in the Market for Trolley Catchers, Retrievers, Bases or Head Lights

We manufacture Knutson No. 5 Trolley Retriever, Knutson No. 2 Trolley Retriever, The Ideal Trolley Catcher, The Simplex Trolley Base, The Peerless No. 10 Roller-bearing Trolley Base, The Peerless Check Valve, The Peerless Junior Head Light, The Perfect Head Light, The Hollis Safety Fender, No. 3 Detachable Fender.

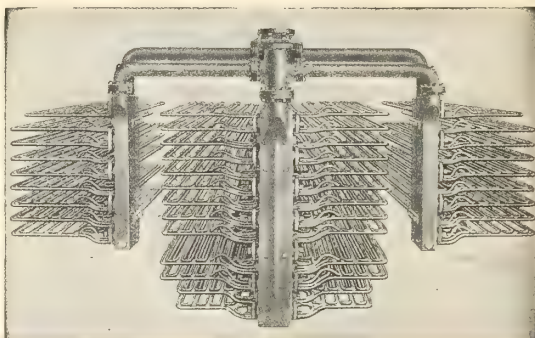
Write our Canadian Representatives Allen General Supplies, Limited they will be pleased to give you complete information as to any of the above as well as our other lines.

Trolley Supply Company, Canton, Ohio

Address all correspondence to Allen General Supplies, Limited, 205 Yonge St., Toronto

Fire Tube Marine Superheater -- Eight Reasons Why

1. It is adaptable to either new or existing boilers of the fire tube type, and can be applied with no change in design or construction.
2. It renders possible an increase in output of boiler h.p. from a given boiler plant 10% to 20%.
3. It will produce the same power output with fewer boilers.
4. It reduces the size of the bunkers, thereby reducing the draft of the vessel with a given cargo, or making possible an increase in revenue cargo.



5. It results in a saving of fuel over saturated plants, both operating under the same draft conditions, of 10% to 20%.
6. It reduces the maintenance costs by the prevention of water hammer, leaky flanges, and condensation in the cylinders.
7. It does not prevent rapid, thorough, and frequent cleaning of the tubes.
8. Its construction provides easy access to all screwed joints and the easy removal of the parts.

LOCOMOTIVE SUPERHEATER COMPANY

30 Church Street, New York, N.Y.

Peoples Gas Bldg., Chicago, Ill.

Jas. W. Pyke & Company, Limited

Iron, Steel and Metal Merchants

Locomotive, Driving, Engine and Tender Truck Axles, Passenger, Freight, and Electric Tram Car Axles—To Standard or Railway's own Specification.

Staybolt and Engine Bolt Iron—Quality and Service Unexcelled.

Steel Plates—Firebox, Flange and Tank Qualities.

Structural Shapes—Beams, Channels, Angles, Tees, Zees, etc.

Steel Billets and Forgings—of all descriptions.

Locomotive Boiler and Superheater Tubes—Seamless and Lapwelded.

We solicit your enquiries when in the market for any of the above material.

OFFICE: Commercial Union Building,
232 St. James Street,

Montreal

Canada Iron Foundries, Limited

Chilled Tread Cast Iron Car Wheels for All Services
Cast Iron Water, Gas and Culvert Pipe,
Flanged Pipe and Specials
Railway Castings

HEAD OFFICE:

Mark Fisher Building

-

-

-

Montreal

American Flexible Staybolts

Manufactured in Montreal



Made of the best standard staybolt iron, adding flexibility by process of making as shown above---closely approximating a rope structure.

Write for booklet on subject.

TAYLOR & ARNOLD, Limited

MONTREAL

WINNIPEG



The Star Brass Works

Largest Exclusive Trolley Wheel Makers in the World.

Kalamazoo

Michigan





Double Elliptic Street Car Springs with Cast Ends.

Railway Springs

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.

EQUALIZING, DRAWBAR, BUFFER AND SPIRAL SPRINGS of all kinds.

STREET RAILWAY SPRINGS, from the largest to the smallest.

TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE SANDERS, CHAIN, Etc.

Manufactured by

B. J. Coghlin Company, Limited
Montreal, Canada



REAMERS

**Cutters, Taps, Dies
and Drills**

"P. & W. Co." Insures QUALITY

See that it is on the tools you buy.

Pratt & Whitney Co. of Canada, Limited

Dundas, Ontario

Vancouver

Montreal

Winnipeg



These Reinforced Brake Shoes weighed approximately twenty pounds each when put in service. When ready for the scrap heap, after long and satisfactory use, they weighed about six pounds each.

Just compare this record with that of ordinary unreinforced brake shoes. Almost invariably they go to pieces before being half worn out, and their average scrap weight is about fifteen pounds.

No argument for ordinary shoes can meet the demonstrated facts that stand behind Reinforced Brake Shoes.

Manufactured in Canada.

Dominion Brake Shoe Company, Limited

The HOLDEN CO., Limited, Agents.

350-356 St. James Street, MONTREAL

Thor

Roller Bearing Piston Air Drills

Will turn out more work on less air than any pneumatic tools made. Equipped with Corliss Valves, patterned after the famous Corliss Engine, roller bearings, telescopic screw-feed, etc.

Most Powerful, Durable and Economical Air Drills made.
SHIPPED ON TRIAL—FREE.

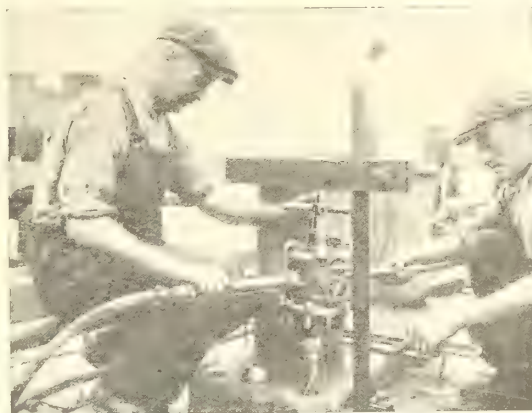
Independent Pneumatic Tool Company

334 St. James Street, Montreal, Que.

Toronto—32 Front St. West

Winnipeg—123 Bannatine Ave. East

Vancouver—1142 Homer Street



Size B Thor Drill drilling 1 5/16" hole in towing bit. Machinists gang.

Canadian Government Railways

Shortest Route

QUEBEC — WINNIPEG

Quickest Time

Connection from Maritime Provinces
by Maritime Express
with

WESTERN NATIONAL

Dep. Quebec	4.30 p.m. Tues., Thurs., Sat.
" La Tuque	9.40 p.m. Tues., Thurs., Sat.
" Amos	10.22 a.m. Wed., Fri., Sun.
Arr. Cochrane	4.10 p.m. Wed., Fri., Sun.
" Winnipeg	4.30 p.m. Thurs., Sat., Mon.

Direct connection in Union Station for the West, North-West and Pacific Coast.

F. P. Gutelius,
General Manager.

C. A. Hayes,
General Traffic Manager.

MONCTON, N.B.

Connections from Pacific Coast, Northwest and West
in Union Station, Winnipeg,
with

NATIONAL ATLANTIC

Dep. Winnipeg	5.15 p.m. Sun., Tues., Thurs.
" Cochrane	7.15 p.m. Mon., Wed., Fri.
" Amos	1.13 a.m. Tues., Thurs., Sat.
" La Tuque	2.00 p.m. Tues., Thurs., Sat.
Arr. Quebec	7.00 p.m. Tues., Thurs., Sat.

Connection at Levis with Ocean Limited for Maritime Provinces.

H. H. Melanson,
General Passenger Agent.

Buffalo Brake Beam Company

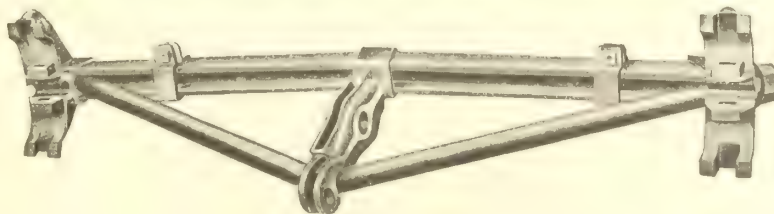
BUFFALO BEAMS ARE BEST BEAMS

Offices:

NEW YORK
30 Pine Street

ST. LOUIS
Syndicate Trust Bldg.

MONTREAL
195 Commissioner St.



Works:
BUFFALO,
N.Y.

Canadian Works: HAMILTON, ONT.

Brake Beams for all Classes of Cars, Locomotives and Electric Equipment



1916 - 1917

Standing on the threshold of a new year, we pause to look back over the passing year. 1916 has far exceeded our expectations for volume of trade. We fully realize that your co-operation and patronage have done much to make this success possible. It is very gratifying to know that our efforts to serve and please every branch of trade, commerce and industry have been so generously appreciated throughout Canada.

Past successes are but stepping-stones to future achievements. With the New Year, our efforts shall be increased to make the DOMINION RUBBER SYSTEM of still greater service and benefit to Canadians and the industries of Canada. Our constant purpose at all times, shall be to make this the **one** safe and satisfactory place to supply every need in rubber.

To one and all, we extend the season's Greetings, and our best wishes for a Happy and Prosperous Year, with the hope that, during the coming year, PEACE may again prevail among the nations of the World.

Canadian Consolidated Rubber Co., Limited
MONTREAL, CANADA

Canadian Railway and Marine World

December, 1916.

Government versus Private Ownership of Railways.

By Samuel O. Dunn

One of the most marked tendencies throughout the world during the last half or three-quarters of a century has been the tendency of governments to intervene more and more in industrial affairs. During a long period, which ended at about the time of the French Revolution, governments everywhere, and especially on the continent of Europe, were active participants in industry, and regulated closely almost every class of business which they did not undertake to manage. There then began a great and widespread reaction both in economic and political philosophy and in economic and political affairs. The leading thinkers on economic and political subjects began to teach that that government was best which governed least, and a very large amount of legislation was enacted to take governments out of business and to emancipate industrial enterprises from public control. The period during which the doctrine of *laissez faire* prevailed lasted, roughly, until the beginning of the latter half of the nineteenth century. Then the pendulum commenced to swing the other way, and it has continued to do so until now throughout the leading countries of the world governments are managing many important enterprises and are strictly regulating many which they do not manage.

In no field has this increasing tendency of government to intervene in industrial affairs been more strikingly illustrated than in the railway field. So extensive has the policy of government ownership and management of railways become that it is often represented as having grown to be the dominant policy of the world. This, however, is by no means correct. The mileage of railways owned and managed by private companies is still more than twice as great as that owned and operated by governments. In 1913, the latest year for which we have complete statistics, there were in the world 690,133 miles of railway. Of this, 464,421 miles, or 67%, belonged to private companies, and only 225,712 miles, or 33%, belonged to governments.

It is a fact, however, that North America is the great stronghold of private ownership, and that outside of this continent there is now a greater mileage in the hands of governments than in those of private companies. There are over 305,000 miles of railways in North America, and of this more than 290,000 miles, or over 95%, is privately owned and operated. In all the world outside of North America there are 385,000 miles, and of this 211,147 miles, or 55%, is owned by governments, while 174,000 miles, or 45%, is owned by private companies. It will be seen, therefore, that the mileage in North America which is privately owned and operated exceeds the total mileage owned by governments in all the world, while even outside of North America almost one-half the mileage is owned and operated by private companies.

Nor does it give a correct idea to say that government ownership has been adopted by most leading countries. Germany has adopted it, but Great Britain adheres to private ownership. Most of the railways of Austria-Hungary are state-operated, but most of those of France are still in private hands. Most of the railways of Italy and Russia are state-owned, but in the principal country of South America, Argentina, with a mileage greater than that of Italy, and in Canada, with a large and rapidly increasing mileage, private ownership is still greatly preponderant. Japan is committed to government ownership, but in the United States, which alone has a mileage exceeding that of the combined state-owned railways of the world, private management is the sole policy.

To say, therefore, as some do, that countries such as the United States and Canada should nationalize all their railways because the enlightened public sentiment of the world has decided in favor of this policy is to reason from an assumption which is not based upon facts. Furthermore, even if it were true that all the rest of the world had adopted government ownership, this would be no very forcible argument for adopting it in North America. In reasoning regarding any policy which is proposed for adoption we should give the greatest weight to the particular conditions under which it would have to be carried out. Now, the conditions, political, military and economic, which prevail in the United States and Canada are widely different from those which prevail in Europe, for example. Military considerations have been very influential in shaping the railway policy of some of the European countries, and especially Germany. The conditions which have made it desirable, or which have been regarded as making it desirable, for some of the governments of Europe to directly own their railways, so that they can be prepared to use them for military purposes at a moment's notice, do not exist on this continent, and we all hope and believe that they never will. Many of the countries of Europe which have extensively adopted government ownership are monarchies, while, regardless of constitutional forms, Canada as well as the United States is a democracy. It is hardly necessary to add that the economic conditions on this continent are widely different from those in Europe. If we on this continent are going to decide wisely on the question of private versus government ownership, we must get clearly and keep constantly in mind our own peculiar conditions, and then try to determine which policy will produce the better results under those particular conditions.

The policy of government ownership is sometimes advocated on the somewhat theoretical ground that the provision of highways is a function of the state, and that railways are highways. Of course, on this theory, it follows that railways

should be owned and managed by the government. But this argument disregards the fact that railways not only provide a highway but also carry goods and passengers. Now, this fact is of some importance, for never before the railway was invented was it considered a function of the state to become a carrier for hire, and even since it was invented governments very seldom have assumed the function of carriage except when they have become the owners and managers of railways. They provide highways for water carriers; but they do not ordinarily own the ships operated on them. They provide highways for vehicle traffic; but they do not ordinarily own the teams and wagons, the motor trucks and taxicabs which use them. While it must be conceded that governments always have provided highways, it cannot logically be concluded from this fact that the ownership and management of railways is naturally a government function. How can it be held to be naturally a government function, when about 60% of the expenses usually incurred are attributable to the service of carriage, which, on historical grounds, may be held to be within the normal scope of private enterprise?

The question of government versus private ownership has various phases, but there are two whose importance is paramount. One of these is the economic phase. Which policy will better promote the material welfare of the public—in other words, which will better promote the efficient production and the equitable distribution of wealth? The other phase which is of the first importance is the political phase. Will private ownership or government ownership have the better effects on the government of the country, and especially on that of a country having democratic institutions such as yours in Canada and ours in the United States.

Let us turn, first, to the question of which policy will more efficiently promote the production of wealth. The transportation of freight by rail, and the transportation of passengers by rail when they are travelling on business, is merely one of the processes of production. If the management of the railways is inefficient and wasteful and, in consequence, the expense incurred in furnishing the service of transportation is excessive, this reduces the efficiency and increases the cost of all the industrial processes carried on in the entire country. This remains true whether the total cost incurred in rendering the service is covered by the rates charged for it, or only part of it is covered by the rates charged and the other part of it is covered by taxes levied upon the public to pay deficits incurred by the railways. If it actually costs \$10 to move 1,000 tons of freight one mile the burden directly or indirectly imposed upon the industry of the country for the transporting of that 1,000 tons one mile is just the same whether \$5 of the cost is paid by the taxpayer and \$5 by the shipper, or

the entire \$10 is paid by the shipper.

As, in the long run, the entire expense incurred in providing the service of transportation must be borne by the industry of the country, the public welfare demands that, other things being equal, that railway policy shall be adopted which will keep this expense at the lowest practicable minimum. Now, assuming that there are certain unit costs, such as the wages of labor and the prices of materials, which must be met, and a certain standard of service which must be maintained, it is evident that that railway policy will be most conducive to economical management which is adapted to securing the ablest and most energetic administration of the affairs of the railways.

Business costs are always of two classes—return to invested capital and expenses of operation. It is as absolutely impossible to avoid incurring the one as to avoid incurring the other. If private companies are to be permanently successful in furnishing railway service they must be able to raise capital, and they will not be able to raise capital unless they are able to, and do, pay interest and dividends on it. Likewise, if a government is to provide railway service it must raise capital, and if it is to raise capital it must pay interest on it. The books may be so kept as not to show how much interest actually is paid on the investment, but because the books are not made to show the facts will not alter the facts. You might also so keep the books as not to show all the operating expenses, but this would not make the operating expenses any less.

The advocates of government ownership contend that it enables capital for the construction and development of railways to be raised more cheaply, and that it causes their administration to be more efficient than private ownership and management. Governments ordinarily can borrow money cheaper than private companies. But the total return which must be paid on the capital invested in railways does not depend merely on the rate of interest paid. The total return required on the investment in a mile of railway is determined not only by the rate of interest, but also by the amount of capital spent to produce that mile of railway. If a company would have to pay 5% for capital and a government only 4%, but the company would build a railway for only two-thirds as much as the government would spend, the total interest which the company would have to pay on the investment would be less than the total interest the government would have to pay.

Now, whether the cost of building a new railway or of improving an old one will be high or low will be determined chiefly by whether its affairs are skillfully administered. The same thing is true as to operating expenses. The situation is precisely similar to that met in other lines of business. One man builds a factory extravagantly and operates it expensively, and it is a commercial failure. Another, with perhaps less credit and financial resources, builds a factory economically and operates it efficiently, and it is a commercial success. In the railway field, as in that of manufacturing, costs of production depend upon the skill of the management; and the requisites of skillful administration are the same under government as under private management.

Probably the most fundamental and important difference between government

regulation and government ownership of railways is that under the former public officials exercise merely the authority of supervision and correction, while under the latter they exercise the authority and perform the duty of actual administration. The two functions are widely dissimilar. The main function of all regulating bodies is to make broad general rules for the guidance and control of the acts of others. The administrative, or managing, function, on the other hand, is initiating, dynamic, executive. The management of a railway system conceives projects and carries them out. It determines where it will be advantageous and desirable to build extensions and make improvements and how these things shall be done. It determines according to what ideals and standards the property shall be maintained and operated. It selects and directs the officers of all ranks. It selects, directs, trains and disciplines the employees and determines within limits fixed by law and public opinion their wages and working conditions. On its judgment, courage, energy and ability in doing these things mainly depends the success of the railways, whatever their ownership.

Whether the governments of Canada and the United States, under the political conditions which prevail in these countries, may be confidently relied on to develop and support railway administrative organizations which will manage the railways as well and economically as private companies, is open to grave question. One of the greatest difficulties met in securing the skillful administration of government concerns is that of obtaining and retaining efficient managers for them. Governments, and especially democratic governments, will seldom pay as high salaries as private concerns to get men for positions demanding first class ability. However, the honor inherent in public office is more attractive to many able and public spirited men than a large income, and therefore, in spite of small salaries, governments may often get strong men if their appointments and tenure of office are made to depend on their merits and if they are left free to do their work without political influence. But in most democratic countries, such as Canada and the United States, the appointments to important offices in the public service are usually determined chiefly by political considerations. There is hardly an officer of a railway or of an industrial corporation on this continent who does not owe his position to his experience and proved ability in his special line of work. There are few high public officials, except in the army, the navy and the courts, who do owe their positions to such qualifications.

The managers of any business, public or private, even though of great ability, cannot administer it with energy and skill unless left free from interference except on business grounds. But are the officers of government railways in democratic countries likely to be as immune from such interference as those of private railways? You have had some experience with government management of railways in Canada, and I do not understand that the higher officers of your state railways always have been appointed solely because of their qualifications or that they have always been left free from political interference. But if the managers of government railways are not to be chosen and retained solely because of their peculiar qualifications for their duties, and are not to be left free from

political interference, upon what ground can it be assumed that they will be able to develop and operate the properties so as to keep down the cost of transportation to what it would be under private management?

Political considerations tend to cause lines to be built and improvements to be made where they are not most needed to promote the economic welfare of the country. They cause men to be taken into, retained and advanced in the service largely regardless of their merits. They cause a greater number of men to be employed than are actually needed. They sometimes cause contracts to be let and purchases to be made which would not be countenanced if business principles alone prevailed. They sometimes cause passenger and freight service to be rendered, not on business principles, but to placate the voters in certain forward communities. These statements are not based merely on surmise. They can be substantiated by evidence afforded by government management of railways in many countries. Nor are those directly charged with the management of the railways to be held entirely responsible. In many cases they have fought courageously and determinedly against such abuses, only to find that their resistance availed but little.

The conclusion necessarily suggested is that, under democratic conditions at least, state railways are less likely to be efficiently and economically developed and operated than private railways. This conclusion is supported by evidence afforded by the operating and financial results of government and private railways throughout the world. There are 17 countries in the world in which the capitalization, or cost of construction per mile of the railways exceeds the average of the railways of the United States. In only six of these does private ownership preponderate, while in eleven, government ownership preponderates. The cost of construction of the Intercolonial Railway of Canada, the oldest, and until recently the largest, government-owned railway on this continent, is officially reported at \$75,000 per mile. This is about the same as the cost of the leading railways of Australia, the state railways of New South Wales. The National Transcontinental, which also has been built by the government of Canada, has cost substantially more than this. These figures greatly exceed the average capitalizations per mile of the private railways of Canada and of the United States. The average net capitalization of the railways of the United States, including all the great systems, with their numerous multiple track lines and dense traffic in the populous eastern part of the country, is only \$67,000 a mile. There are, of course, exceptions, but the general rule throughout the world is that governments invest more capital in railways to handle a given amount of traffic than private companies do.

When we turn to a comparison of the expenses of operation that state and private railways incur in proportion to the total traffic which they handle, we find facts of a similar character. The private railways of France handle more traffic in proportion to their operating expenses than do the state railways of that country. The railways of Prussia are the best state managed railways in the world, and yet the private railways of France handle more traffic in proportion to their operating expenses than do the state railways of Prussia. The private rail-

ways of Canada handle more traffic in proportion to their operating expenses than does the Intercolonial. In fact, the private railways of Canada and of the United States handle more traffic in proportion to their operating expenses than any other railways in the world, in spite of the fact that railway wages on this continent are the highest in the world. I would not undertake to maintain that private railways always are more economically managed than state railways. I do not believe that is a fact. But I am sure, after having studied the subject for a long time, that, as a rule, private management is more economical than state management.

It may be suggested that the higher expenses of state railways are due to the fact that they give better and more adequate service than private railways. But the strongest stimuli which promote the development and improvement of the service under private ownership are wanting under government ownership. The opportunity for private gain is abolished. Competition is eliminated. There is no superior regulating authority to compel the government to remedy the defects of its service. As substitutes for these influences there is a public sentiment which demands the construction of new mileage and the making of improvements, and a management desirous to please that part of the government or the public which can apply the most pressure. It does not seem probable that ordinarily the influences tending to promote the improvement of railway service under government ownership will prove to be more potent than those tending to promote it under private ownership, and, furthermore, the facts do not show that state railways ordinarily do give better service than private railways.

It may be said, and truly said, that even though it be demonstrated that it costs more to develop and operate railways under government than under private ownership, this does not make out a case, even on economic grounds, in favor of private ownership. Equity in the distribution of wealth is as important to the welfare of the public as efficiency in its production, and it may be contended that under government ownership the wages paid to labor will be higher, the passenger and freight rates charged to the public will be lower, the public instead of private companies will receive the profits earned by the railways, and, in consequence, the public, on the whole, will be better off. Let us, then, turn to a brief consideration of the relative effects which private and government ownership may be expected to have on the distribution of wealth. It may safely be assumed at the outset that under either system there will always be a struggle going on between the various classes of the community and sections of the country to determine how the burdens and benefits resulting from the development and operation of the railways shall be divided. Under either system travellers and shippers always will want low rates, labor will want short hours of work and high wages, and the owners of the railways, whether they be private capitalists or the public, will want to keep the profits large or the deficit small, as the case may be. The welfare of the public demands that this struggle shall be kept within reasonable bounds, and that at the same time it shall not be allowed to result in some of those engaged in it securing unfair privileges and advantages at the expense of the

others who are engaged in it. The only authority which conceivably can thus at once control and arbitrate the struggle is obviously the government of the country.

But the government of a country is not a mere mechanical device which automatically registers what is right and wrong, what is fair and unfair, and in the same manner issues its decrees and compels obedience to them. The government of a country is composed of ordinary men who enact and administer laws; and in a democratic country those who make and administer the laws owe their offices, and depend for the opportunity to continue in them, on the votes of their fellow-citizens. Therefore, we may be sure that under either system, the men who, in a democratic country, compose the government will always deal with matters affecting railways with some regard to their own political interests as well as with some regard to the economic welfare of the public; and the system which will be most likely to cause equity to be done between all parts of the people is that system which will tend most strongly to make it to the interest of those in office to hold the balances even as between all classes.

Under the system of private ownership and public regulation—and public regulation has become the rule wherever private ownership exists—public officials, including especially those particularly delegated to regulate the railways, occupy positions of more or less detachment with respect to railway affairs, and the pressure brought to bear upon them by the various classes and sections of the country tends to cause them to deal out approximate justice. Railways cannot be successfully developed and operated under private ownership unless those who invest in them are allowed to derive a reasonable return from their investment, and the arguments that may be marshalled and the pressure which may be brought to bear in support of making the practice conform to sound principle usually result in private railways being allowed to earn enough to raise adequate capital. There are likely to be temporary deviations from the correct practice in this respect, as we have found in the United States, but recent decisions of the Interstate Commerce Commission have shown that even in our country, where hostility to the railways has been extreme, it is by no means impossible to convince intelligent regulating bodies and the public that advances in rates are sometimes as justifiable as reductions are at other times.

At the same time, under the system of private ownership and public regulation rates and earnings are not likely to be allowed to become excessive, for, as experience has shown, and nowhere more conclusively than in Canada and the United States, those who directly pay the rates are quite capable of organizing effectively for the purpose of fighting for reasonable reductions in rates and to prevent unreasonable advances in them, and are not at all loath to do so. Similarly, the employes of private railways subject to public regulation have shown that by organizing, arguing, threatening to strike and even going to the government for legislation, they are able to get and keep their wages on quite as high a basis as the employes of other classes of concerns and even as the employes of governments themselves. Finally, where railways are privately owned public officials are pretty sure in the long run to be alert and active

in compelling the companies to contribute in the form of taxes and otherwise their fair share, if not more than their fair share, toward the support of the government.

The situation is most radically changed when railways become the property of the government. As I have said, the struggle between the various classes and communities of the country over railway matters continues under this system, but the government and the men who compose it then cease to be in a position where they can arbitrate between the various parties involved, and become directly involved as parties to it themselves. In a democratic country, such as yours and ours, the authority of the law-making body over the railways under government ownership becomes omnipotent and it can make any distribution of the burdens and benefits of railway operation that it sees fit. It may delegate the regulation and management of the railways to commissions or other officers and give to them a large amount of independence, but this is seldom done except for short periods, for no matter how much independent authority may theoretically be given to others under government ownership, it is always well known that the authority the lawmakers have given they can take away, and, therefore, there are always bound to be constant appeals from the railway managers or the railway commission to the law-making body itself. In consequence, the lawmakers, and through them the management of the railways, are bound to be constantly subjected to political pressure from all of the interested classes and communities. They will be subjected to pressure by bodies of the employes for higher wages and easier conditions of work. They will be subjected to pressure by organized bodies of shippers for low freight rates and by organized bodies of commercial travellers, workmen and commuters for low passenger rates.

There is, however, one class in the community which is not susceptible of organization, except, perhaps, very sporadically and temporarily, for the purpose of influencing government in its behalf. This class is that composed of the taxpayers. It is a much larger class than any of the others, but an organized body of voters, having a single interest which it has been organized to promote, is as much more efficient than a larger unorganized body of voters, in exerting political pressure in a democratic country as a trained body of regular soldiers is superior as a fighting body to a mob of untrained, undisciplined recruits. The consequence is that the one class which under government ownership of railways is likely not to have its interests protected by the government is the taxpayers. Most of us pay some taxes directly. All of us pay taxes indirectly. They enter into our house rent, into the cost of our clothing, into the prices of everything we eat or drink. There is no way by which their payment can be evaded, and, in consequence, the cost of living of all classes increases with the increase of taxes. Because of this increase of taxes the results of government ownership to certain persons may be different actually from what they are nominally. The passenger or shipper who may get lower rates or the employes who may get easier conditions of work, may largely, or wholly, pay for these advantages in the form of higher taxes and a higher cost of living; and for a large majority of the public the increase in their taxes and cost

of living caused by government ownership will be a net loss. Unfortunately, the taxes raised to pay the deficits incurred by state railways are usually so mixed up with the taxes raised for other purposes that those who pay them have no idea what part of them is to be used to pay the ordinary expenses of the government and what is to be used to pay the deficit of the railways.

The conclusion that the increased economic burden which will usually have to be borne by industry and by the public as a result of government ownership will be imposed mainly on the taxpayers, is supported not only by theoretical reasoning, but by the actual experience of most countries where government ownership of railways obtains. It cannot be shown that the average wages paid by state railways are ordinarily higher, under comparable conditions, than those paid by private railways, although undoubtedly under government ownership more men usually are employed to do a given amount of work. It cannot be shown that under comparable conditions the rates of state railways usually are lower than those of private railways. It is true that in Canada the rates of the Intercolonial, both passenger and freight, are relatively low, but the usual rule is that the passenger rates of state railways are somewhat lower than those of private railways, while the freight rates are somewhat higher. Considering the passenger and freight rates together, the total amount which has to be paid for the transportation of a given amount of traffic usually is relatively more on state railways than on private railways.

One thing, however, which may be conclusively demonstrated is that while private railways invariably are required to pay taxes to the public, the usual rule as to state railways is that taxes have to be collected from the public to make up deficits which they incur. One of the most extreme examples of this kind is afforded by your own Intercolonial Railway. My study of its figures, and a somewhat hasty and cursory observation of the physical property itself, have led me to believe that the Intercolonial is now being managed with an economy and skill which are a vast improvement over those shown in its management until within the last two years. Regardless of that, however, during the years from 1867 to 1914 the Intercolonial failed by \$9,600,000 to earn even its fair operating expenses. In 1914 the property was carried on the books at a cost of \$103,431,000. I had a calculation made to ascertain the total amount the road had cost the people of Canada. This was based on the assumption that, on the average, it ought to earn its operating expenses and 4% on the actual investment in it. This certainly is a conservative basis. This estimate showed that up to 1914, including the actual investment in the road and the total losses it had incurred, the road had cost the people of Canada over \$348,000,000. Assuming that it is actually worth today the cost at which it is carried on the books, its total cost to the taxpayers of Canada has been \$245,000,000 more than its present value. These losses have been partly due to the lowness of its rates, and partly to its uneconomical management; but to whatever cause they have been due, the losses have had to be borne by the taxpayers of this country.

While the case of the Intercolonial is an extreme one, it is by no means exceptional. There are some state railways which earn the interest on the total in-

vestment in them, and even more. This is true, for example, of those of Prussia and of Japan. But in Belgium, Italy, France, Norway, Sweden, Austria, Hungary, Switzerland, Russia, Australia, New Zealand, Argentina, and most other countries the state railways have on the average failed to earn their operating expenses and interest, thereby incurring deficits which have had to be borne by the taxpayers. I am aware that it can be shown that in some years the railways of some of these countries have earned their interest. I am speaking now of what they have done on the average over substantial periods, and the rule is, that over any considerable period almost every state railway in the world imposes burdens on the taxpayers, while almost every system of private railways pays taxes into the public treasury.

One question which may be raised in this connection is as to whether it is a violation of sound principle for state railways so to make their rates as to cause deficits, and thereby impose burdens on the taxpayers. It is a well known fact that the rates of your Intercolonial Railway are relatively low, and it is sometimes contended that all its losses have been due to the lowness of its rates. My study of its statistics and observation of its physical condition convince me that its losses, at least until within the last year or two, have been due more to uneconomical management than to low rates. This conclusion derives strong support from the fact that within the last two years the present management has been able to increase the earnings about \$1,600,000 a year, while actually reducing the expenses by about \$600,000 a year. But suppose its losses have all been due to the lowness of its rates. Is that a sufficient defense of them? Either those who pay non-compensatory rates and those who pay the taxes levied to meet the deficits they cause, are the same people, or they are different people. If they are the same people, what they gain by the rates is taken from them in increased taxes. If they are different people, those who pay the rates get their transportation for less than cost and those who pay the taxes pay for something they do not get. It is hard to see how anybody can be benefited by saving money through low rates and having it all taken away in increased taxes. It is also hard to find justice in giving some people low rates at the cost to others of higher taxes.

Both common sense and equity require rates to be so fixed that those who receive transportation service shall pay for it in full. The application of this principle to the situation in Canada makes it easy to decide in regard to the soundness of the rate-making policy followed on the government railways, if to it are due their losses. These railways serve only the people of the Eastern Provinces, and but part of them. The people of the entire Dominion must pay the taxes levied by the government. Therefore, if the trouble with the government railways is that their rates are too low, the few who use their service are unfairly benefiting at the expense of all the people of the country.

There is absolutely no more justification, on grounds either of economics, or of equity, for so making railway rates as not to cover interest on the investment, and then calling on the taxpayers to make up the deficit, than there would be for charging no rates at all, and calling on the taxpayers to pay both the total operating expenses and the interest. The interest on

the investment is just as clearly a part of the cost of providing the service as are the operating expenses.

The conclusion suggested by the foregoing facts and considerations, it seems to me, is that not only are private railways more likely than state railways to be so managed as to keep the economic cost of transportation down to the minimum, but that they are more likely under the system of public regulation, which now obtains almost universally where private ownership obtains, to be so managed and regulated as to promote equity in the distribution of wealth than state railways.

Let us now turn to some of the political considerations bearing on the subject. Many years ago a commission of the Italian Government investigated the subject of government ownership and reported that, in its opinion, under that policy "politics would corrupt the railroads and the railroads would corrupt politics." I have given my reasons for believing that especially under democratic conditions political considerations and political pressure are bound to exert so great an influence on the management of state railways as to cause them to produce less satisfactory economic results than would be produced by private railways. But whatever makes political considerations and political pressure exert more influence on the management of railways under government than under private ownership will at the same time make the railways under government ownership a more demoralizing influence in politics than they would be under private ownership. If it tends to demoralize the management of the railways to have men taken into and advanced in their service for political reasons, this taking them into and advancing them in the service for political reasons will also have a demoralizing effect on politics. If the giving of railway contracts for political reasons will tend to demoralize the management of the railways, it will at the same time tend to demoralize politics. If the granting of concessions to the employees for political reasons will tend to demoralize the management of the railways it will at the same time tend to demoralize politics. And so all along the line.

Now, a country with an autocratic government, such as that of Prussia, may be able to keep politics out of its state railways and its state railways out of politics. In such a country, therefore, the dictum that under government ownership "politics will corrupt the railroads and the railroads will corrupt politics" may not be true. In Prussia the suffrage is so regulated that the political influence of the different classes of the people is determined by their wealth and not by their numbers, and therefore the railway employees are almost entirely without political influence. It is in consequence of this that the government is able to, and does, prohibit them from belonging to labor unions of any kind and subjects them to a strict military discipline. But what can be done in a country having such a government, and having a people willing to submit to such a government, as Prussia, is no criterion of what can be done in a country having such a people and such political institutions as we have in Canada and the United States.

I am not sufficiently familiar with your affairs to know just to what extent politics pervades your government affairs and enterprises. I have, however, devoted much study to the results of your state railways, especially the Intercolonial, and

I have talked a good deal about the management of these roads with citizens of your country, and I have gained a very strong impression that these railways at times have played some part in politics and that politics have played some part in their management. My familiarity with affairs in the United States is greater, and certainly there is no department or enterprise of the government of my own country in which politics does not play an important part. Therefore, to assume in the United States that under government ownership the railroads would not corrupt politics and that politics would not corrupt the railroads would be to disregard practically all past experience.

One may sincerely and ardently believe that democracy is the best form of government to secure to the citizen the inalienable rights to life, liberty and the pursuit of happiness; one may have confidence that democracy can succeed in so regulating the relations between large business concerns and the public, as well as between individual and individual, as to protect the rights and further the interests of all; and yet be convinced that so far as democratic government has as yet developed in most parts of the world it is not a good form of government for managing commercial enterprises. A government to be successful in the management of very large commercial enterprises must, to a very great extent, be organized and administered as successful private business concerns are organized and administered. The fundamental requisites of successful business management cannot be altered by the simple expedient of transferring concerns from private to public ownership. Whether a business is owned and managed by a corporation, or owned and managed by the public, the owners, in order that it may be run successfully, must choose and retain the managers solely because of their special fitness for their duties. Having done this, the owners must give the managers wide discretion and authority, especially for dealing with the employees. The owners must interfere very little with what the managers do, and ordinarily must try to hold them responsible only for general results. A democratic government may successfully regulate private concerns that are thus organized, officered and managed; but few democracies have ever shown an effective disposition to have business concerns owned by themselves organized, officered and managed in this way; and until they do show such a disposition it is folly to expect them to manage railways and other great industrial enterprises efficiently and beneficently.

EDITOR'S NOTE.—The foregoing paper was read by Samuel O. Dunn, of Chicago, Editor, Railway Age Gazette, before the Canadian Club, Toronto, Oct. 30, and before the Canadian Club, Montreal, Nov. 7.

Sleeping Car Berth Rates Advanced.—

The Railway Executive Committee in Great Britain has advanced the prices for sleeping car berths as follows:—From or to London and any other English station to or from places south of Berwick and Carlisle (both stations exclusive), from 7s 6d to 10c; Berwick and Carlisle and places north thereof, from 10s to 15s.

The Grand Trunk Pacific Ry has had taken under its auspices a series of films showing the life and resources of Western Canada which will be displayed this winter over a circuit of some 4,000 moving picture theatres in the United States.

Lake Superior Corporation's Subsidiary Transportation Companies.

Following are extracts from the Lake Superior Corporation's report for the year ended June 30, 1916:

Algoma Central and Hudson Bay Ry. Co.—A settlement of outstanding questions as between the Algoma Central & Hudson Bay Ry. Co., the Algoma Central Terminals, Ltd., and The Lake Superior Corporation has been arrived at which it is believed, will lead to a speedy discharge of the receivers of both the railway company and the terminals company. A bondholders' committee, representing both railway and terminal bondholders, has been appointed, and in this committee has been vested the outstanding common stock of the railway company for the purpose of exercising all voting and other rights incidental thereto. Of the \$5,000,000 preferred shares issued to and held by the public, \$3,000,000 of a new substituted non-cumulative preference stock will be issued as fully paid to the bondholders' Committee for distribution amongst the railway bondholders and terminal bondholders. Your corporation are the holders of \$5,000,000 of common stock and subject to the voting trust referred to, will retain this holding intact and in addition will receive in satisfaction of the debt of \$318,800, a like amount of the railway company's second mortgage bonds. Monies representing the unexpended balance of the proceeds of the terminal bonds will be paid over to the bondholders' committee, for the benefit of the railway company in the development of its properties and otherwise. Both the terminal bondholders and the railway bondholders have made certain modifications and concessions as to the payment of their respective interest. Briefly, the terminal bondholders will be paid interest at the rate of 3% per annum from Aug. 1, 1914, to Aug. 1, 1915, on account of interest due for that period, as soon as practicable after the scheme becomes effective. Subject to this special payment, the interest on the railway bonds from June 1, 1914, and on the terminal bonds from Aug., 1914, together with the sinking fund on the latter, shall only be payable if and to the extent that company and the terminals company are sufficient to pay the same. After Aug. 1, 1921, 1½% shall be definitely paid on terminal bonds each half-year. Interest unpaid in any year on railway bonds and terminal bonds is to be cumulative, and is to be paid out of the joint net earnings of subsequent years.

As from June 1, 1914, joint net earnings in each year are to be applied in the following order of priority: (1) In paying interest at 3% on terminal bonds for year in question and interest at like rate for any preceding year or years so far as interest to that amount shall not have been paid, and in recouping to capital account expenditures therefrom, after Aug. 1, 1921, in payment of such interest. (2) In paying interest up to 2% per annum for the year in question to railway bondholders and interest up to a further 2% per annum for the year in question to terminal bondholders *pari passu* as if they were one class of bonds. (3) In paying interest to a further 3% per annum for the year in question on railway bonds. (4) In paying railway bondholders and terminal bondholders any arrears of interest up to 5% per annum on their respective holdings *pari passu* in propor-

tion to amount of outstanding arrears on each issue. (5) In providing sinking fund for terminal bonds for year in question. (6) In paying on railway bonds further interest up to 1% per annum for year in question and on terminal bonds further interest up to ½% per annum for year in question *pari passu* as if they were one class of bonds. With approval of bondholders' committee any part of joint net earnings not exceeding 1% on total amount of railway and terminal bonds outstanding may be carried forward to following year instead of being applied as above.

No interest or sinking fund is to be paid in respect of the securities of the railway company ranking after the railway bonds and no dividends are to be paid on railway company shares until all payments provided for as above have been made.

The guarantee of The Lake Superior Corporation still remains in full force and effect, but no holder of railway or terminal bonds is entitled to take action without the consent of the bondholders' committee or unless extraordinary resolutions at bondholders' meetings are passed. Provision is made for the re-transfer of the stock, and for the rights of the committee to cease when principal and interest of both companies' bonds have been paid in full.

Your directors in the foregoing have attempted to summarize the settlement, which is regarded as being the best obtainable in the circumstances. Through the increased activity of the Algoma Steel Corporation, and of the various industries at Sault Ste. Marie, the outlook is much better than it has been for some time. Whilst the railway company's report for the year is not yet to hand, it is understood that earnings, particularly from the steamship line, show a substantial increase. Your directors in the interests of all concerned will do their utmost to co-operate with the new management towards making the Railway Operations a success.

Algoma Eastern Railway Co.—The earnings of this Railway show an increase. During the year financial arrangements were made through which the railway has been equipped with additional rolling stock necessitated through prospective additional traffic. Patents have been received in respect of the entire land grant lands of the railway, aggregating nearly 700,000 acres. Every effort will be made to so deal with these lands as to bring about all possible benefits to the railway company, especially in a financial direction.

International Transit Co.—**Trans St. Mary's Traction Co.**—The former has been disposed of, your Corporation having received \$100,000 for its holdings of common stock. The bonds which were held by outside parties, were assumed by the purchasers. The Trans St. Mary's Traction Co.'s operations are not satisfactory. From an earnings point of view, this street railway has never been a success, and in view of additional and costly paving schemes, which have been launched by the council of Sault Ste. Marie, Mich., and to which the street railway has to contribute your directors have under consideration a sale of the property. This is one of the minor assets of The Lake Superior Corporation,

which on account of the lack of development on the other side of the river has made but little progress.

Great Northern Railway's Annual Report.

The G.N.R. report for the year ended June 30, shows that of the authorized capital stock of \$250,000,000 there has been issued and is now outstanding \$249,476,850. Of the stock unissued 17½ shares of G.N.R. stock is reserved for acquiring 14 shares of the St. Paul, Minnesota & Manitoba Ry., of which 10 shares are the in the company's treasury and four still outstanding; also under the \$19,000,000 issue, 14 shares are not paid in full and 5,200 have not yet been offered for subscription. The bonds issued and outstanding total \$194,863,909.09, against \$194,773,909.09 at June 30, 1915.

The company's investment in Canadian companies, on account of advances made to pay for property, construction, additions and betterments, has been changed during the year, as follows:—

Midland Railway of Manitoba ..Credit	\$ 3,797.72
Manitoba Great Northern Ry.	1,877.68
Crow's Nest Southern Ry. ....Credit	2,001.43
Vancouver, Victoria & Eastern Ry & Nav. Co.	367,404.75
New Westminster Southern Ry...Credit	20,250.27

Total \$343,233.01

The Midland Ry. Co. of Manitoba has laid .35 mile of additional industrial tracks. The New Westminster Southern Ry. Co., in March, 1916, sold the part of its line from Brownsville to Port Kells, B.C., 8.55 miles, to the Canadian Northern Pacific Ry. Co., for \$256,500. The G.N.R. continues to operate over that line under a trackage arrangement.

Following is the financial report of operations for the year:—

Operating revenues	\$81,262,478.29
Operating expenses	43,914,076.14
Net operating revenue	\$37,348,402.13
Taxes accrued	5,132,208.29
Operating income	\$32,216,193.84
Other income	2,845,627.79
Gross corporate income	\$35,061,821.63
Deductions from same	7,461,207.34
Net corporate income	\$27,600,207.34
Dividend on capital stock	\$17,456,390.00
Renewal of Allouez Big Ore stock	256,331.64
Fund for permanent improvements and betterments	3,500,000.00
Pension fund	1,000,000.00
Miscellaneous appropriations	3,100,865.27
Total	\$25,313,586.91

Transferred to profit and loss \$ 2,287,027.38

The President's report contains the following reference to one of the company's lines in Canada: "Work was recommenced upon the line of the Vancouver, Victoria & Eastern Ry & Navigation Co. between Sumas Landing and Kilgard, B.C., a distance of 9.37 miles. This line will be completed and placed in operation early in September, 1916, and will give this company a through Canadian line from Oroville to Vancouver." Referring to the work in progress or completed during the year, the President says 54% of the material required for filling on the False Creek flats at Vancouver, B.C., had been completed; and 1.87 miles of side track and spurs had been completed on lines in Canada. The most important work in progress on the company's property in Canada was the filling in of the False Creek flats and the building of the passenger station thereon.

The consolidated balance sheet shows that the company's investments in its

lines in Canada are as follows:—Midland Ry. of Manitoba, \$2,352,975.89; Manitoba Great Northern Ry., \$2,067,877.68; Brandon, Saskatchewan & Hudson Bay Ry., \$2,150,000; Crow's Nest Southern Ry., \$4,216,485.59; Bedlington & Nelson Ry., \$65,000; Nelson & Fort Sheppard Ry., \$2,119,019.51; Vancouver, Victoria & Eastern Ry & Navigation Co., \$22,248,929.23; New Westminster Southern Ry., \$250,000.

The total length of track operated by the company at June 30 was 10,468.79 miles, of which 8,052.81 miles was main track. The company operated over 305.82 miles under trackage rights and owned but did not operate 6.99 miles of the Minneapolis Western Ry. The Midland Ry. of Manitoba, 17.51 miles, is jointly owned with the Northern Pacific Ry. The Bedlington & Nelson Ry. in British Columbia, 12.58 miles, including spur tracks and sidings, was not operated during the year. The company owns in Canada through its controlled companies 167.62 miles of main track and 31.38 miles of sidings and spurs in Manitoba; and 428.08 miles of main track and 73.38 miles of sidings and spurs in British Columbia; it leases trackage rights over 41.53 miles of track in British Columbia to other companies, and leases from other companies 69.24 miles in Manitoba and 15.45 miles in British Columbia.

Americans to Build Chinese Railway.

A contract for the location and construction of about 1,000 m. of railways in China was signed Sept. 30 by the Chinese government with the Siems-Carey Railway & Canal Co., in which firm the American International Corporation is financially interested. According to the first announcement on Oct. 3 the necessary funds will be raised by a Chinese bond issue to be marketed by the American International Corporation. Reports that the probable cost will be \$50,000,000 or more are unconfirmed by the corporation, as nothing like a definite figure can be agreed upon until the lines are located and the nature of the construction determined.

According to a statement by Willard Straight, Vice President of the American International Corporation, the lines will be located by an American chief engineer who will later, on behalf of the Chinese government, superintend the construction. He will, upon the road's completion, act as its chief engineer. An American auditor and a traffic manager will also be appointed. No routes have been selected, although \$500,000 has been advanced to cover the cost of investigations and surveys. At present there are only about 6,000 miles of railway in China. The construction of the new lines, on which actual work will start in about a year, will therefore almost triple that country's railway mileage.

Siems & Carey are railway contractors of St. Paul, Minn. Last May they signed a preliminary agreement with the Chinese government for the construction of railways there. About the same time preliminary contracts for dredging the Grand Canal were concluded, and the American International Corporation, together with the Siems-Carey Co., organized the Siems-Carey Railway & Canal Co., to undertake the construction of railways and the dredging of the canal. Final agreements for the canal work are now under negotiation. The appointment of F. C. Hitchcock, formerly vice president of the MacArthur Brothers Co., to a similar position with the Siems-Carey

organization in China indicates that possibly he is the American engineer who will have charge of the work. The new contract will be handled on a percentage basis.

Intercolonial Railway Grain Elevator at St. John, N.B.

The electric plant to be built at St. John, N.B., for the Intercolonial Ry. will consist of a working house and a conveyor gallery to the wharf. The principal business of the elevator will be to receive from railway cars and to load into ocean vessels. Facilities for cleaning grain will be included in the equipment. All material used in the construction and equipment, excepting belts and ropes, will be non-combustible. The foundations will be of reinforced concrete piers, going to rock. The elevator will be 106 x 92 ft. It will be entirely of the up-house construction, with two railway tracks going through the first floor. The storage capacity will be 537,000 bush. The first story and bins will be built of reinforced concrete, with the curtain walls of first story of brick. Above the first story will be of structural steel with galvanized corrugated iron covering. The floors and roof will be of reinforced concrete.

The elevator will be equipped with three elevator legs, two for receiving grain from cars and one for shipping. All three, however, may be used for shipping. Each leg will elevate grain to the top story of the cupola and discharge to a 2,000 bush. garner. Beneath each garner 2,000 bush. scale hoppers will be erected supported on 120,000 lb. hopper scale. Each scale hopper will be arranged to discharge to distributing spouts. One of the scales will also be arranged to spout to a carloading spout. On the distributing floor a separator will be installed to receive grain from one of the scales and discharge directly to one of the bins. A passenger elevator will be installed to run between the first and top floors. Power shovel machines will be erected to unload the cars into track hoppers situated beneath the track. There will be four hoppers, two being opposite each receiving leg. Each hopper will have a holding capacity of a carload of grain. The lower end of each hopper will be equipped with a valve so designed and constructed that it will be impossible to have a valve of more than one hopper at a leg open at the same time. A 2-drum car pulled will be erected and arranged so that cars may be handled in either direction on either of the tracks. All power will be electric.

The John S. Metcalf Co., Ltd., Montreal, have prepared the plans and specifications under the instructions of C. B. Brown, Chief Engineer, Canadian Government Railways. The substructure contract has been awarded to Engineers & Contractors, Ltd., Moncton, N.B. Tenders for the superstructure were received up to Nov. 15.

At present the I.R.C. has no grain elevator in St. John, the previous one having been burned some time ago. The new elevator will be built below Prince William St., near Reed's Point Wharf.

Canadian Society of Civil Engineers.—Paul A. N. Seurot, M. Can. Soc. C. E., who has returned from France recently, exhibited and described a series of interesting photographs from the western battle front, at a meeting of the society's general section in Montreal, Oct. 19.

Birthdays of Transportation Men in December.

Many happy returns of the day to:—

E. T. Agate, M.Can.Soc.C.E., ex-Assistant Superintendent Lake Superior Division, Canadian Northern Ry., Capreol, Ont., born at Pittsford, N.Y., Dec. 7, 1874.

A. G. Albertsen, City Ticket Agent, C.P.R., San Francisco, Cal., born at Copenhagen, Denmark, Dec. 31, 1887.

J. H. Barber, M.Can.Soc.C.E., Assistant Engineer, North Toronto Grade Separation, C.P.R., Toronto, born at Cobourg, Ont., Dec. 20, 1856.

O. C. Bishop, Superintendent, Sleeping and Dining Cars and News Service, Canadian Northern Ry., Winnipeg, born at Escanaba, Mich., Dec. 10, 1876.

N. E. Brooks, M.Can.Soc.C.E., ex-Engineer of Maintenance of Way, Western Lines, C.P.R., now at Sherbrooke, Que., born there, Dec. 25, 1866.

Harold Browning, steamship agent, etc., Windsor, Ont., born at Stamford, Lincolnshire, Eng., Dec. 2, 1864.

W. W. Butler, Vice President, Canadian Car and Foundry Co., Montreal, born at Danville, Ohio, Dec. 9, 1862.

J. M. Cameron, General Superintendent, Alberta District, C.P.R., Calgary, born at Lochabar, N.S., Dec. 18, 1867.

M. M. Campbell, Building Inspector, G.T.R., Montreal, born at Bridgeton, N.B., Dec. 17, 1879.

W. C. Casey, General Agent, Passenger Department, Canadian Pacific Ocean Services Ltd., Winnipeg, born at Moncton, N.B., Dec. 12, 1882.

G. W. Caye, General Purchasing Agent, G.T.R., Montreal, born at Malone, N.Y., Dec. 1, 1865.

W. H. Gardiner, City Freight Agent, C.P.R., and District Freight Agent, Esquimalt and Nanaimo Ry., Victoria, B.C., born there Dec. 6, 1859.

A. S. Goodeve, member Board of Railway Commissioners for Canada, born at Guelph, Ont., Dec. 15, 1860.

A. J. Gorrie, ex Superintendent District 1, Transcontinental Division, Canadian Government Railways, Quebec, born at Raith, Kirkcaldy, Scotland, Dec. 10, 1868.

W. H. Grant, Manager of Construction, Mackenzie, Mann & Co., Ltd., and General Tie and Timber Agent, and acting General Storekeeper, Eastern Lines, Canadian Northern Ry., Toronto, born at Acton, Ont., Dec. 8, 1858.

F. P. Gutelius, M.Can.Soc.C.E., General Manager, Canadian Government Railways, Moncton, N.B., born at Mifflinburg, Pa., Dec. 21, 1864.

Jas. H. Hall, President, Western Transportation Co., Ltd., Ottawa, Ont., born at Hawkesbury, Ont., Dec. 20, 1863.

J. T. Hallisey, Superintendent, District 6, Intercolonial Division, Canadian Government Railways, Truro, N.S., born at Beaver Bank, N.S., Dec. 29, 1862.

D. B. Hanna, Third Vice President, Canadian Northern Ry., Toronto, born at Thornliebank, Scotland, Dec. 20, 1858.

J. J. Hennigar, Agent Great Lakes Transportation Co., Windsor, Ont., born at Topeka, Kan., Dec. 21, 1884.

E. W. Holton, General Passenger Agent, Northern Navigation Co., Sarnia, Ont., born at Belleville, Ont., Dec. 15, 1872.

A. J. Isbester, ex Assistant District Engineer, Port Arthur District, Canadian Northern Ry., Port Arthur, Ont., born at Ottawa, Dec. 18, 1879.

R. Johnson, Assistant Locomotive Foreman, C.P.R., Hochelaga, Montreal, born at Quebec, Que., Dec. 24, 1863.

J. T. McGrath, ex-Superintendent of

Motive Power and Equipment, Chicago and Alton Rd., Bloomington, Ill., born at Toronto, Dec. 6, 1869.

A. T. McKean, Division Freight Agent, C.P.R., Winnipeg, born at St. John, N.B., Dec. 18, 1886.

J. M. MacArthur, Superintendent, Kenora Division, Manitoba District, Kenora, Ont., born at Toronto, Dec. 8, 1885.

A. E. Macdonald, General Claims Agent, Canadian Northern Ry., Winnipeg, born at Woolwich, Eng., Dec. 11, 1870.

L. Macdonald, Division Freight Agent, G.T.R., Toronto, born at Montreal, Dec. 10, 1871.

A. D. McTier, General Manager, Eastern Lines, C.P.R., Montreal, born at Blairgowrie, Scotland, Dec. 27, 1867.

J. C. O'Donnell, Superintendent, Districts 2 and 3, Central Division, Canadian Northern Ry., Winnipeg, born at Cobden, Ont., Dec. 17, 1879.

S. R. Payne, Manager, Ottawa Division, New York Central Rd., Ottawa, Ont., born at Jefferson, Ohio, Dec. 21, 1865.

A. Price, Assistant General Manager, Eastern Lines, C.P.R., Montreal, born at Toronto, Dec. 6, 1861.

W. J. Radford, Assistant to General Manager, Toronto Suburban Ry., Toronto, born at Boldre, Hampshire, Eng., Dec. 23, 1870.

G. D. Robinson, Export Freight Agent, C.P.R., Montreal, born at St. John, N.B., Dec. 7, 1877.

Sir Collingwood Schreiber, K.C.M.G., Hon. Mem. Can.Soc.C.E., General Consulting Engineer to Dominion Government, Ottawa, Ont., born at Bradwell, Essex, Eng., Dec. 14, 1831.

W. Tansley, Assistant Superintendent, London Division, Ontario District, London, born at Shelburne, Ont., Dec. 27, 1872.

M. F. Tompkins, Division Freight Agent, Intercolonial Division Canadian Government Railways, Halifax, N.S., born at Margaree, N.S., Dec. 6, 1878.

H. H. Vaughan, M.Can.Soc.C.E., Consulting Engineer, C.P.R., Montreal, born at Forest Hill, Essex, Eng., Dec. 26, 1868.

R. C. Vaughan, Assistant to Third Vice President, Canadian Northern Ry., Toronto, born there, Dec. 1, 1883.

A. P. Walker, M.Can.Soc.C.E., Assistant Division Engineer, Ontario District, C.P.R., Toronto, born at West Hartlepool, Eng., Dec. 9, 1860.

E. H. Wood, General Car Foreman, Michigan Central Rd., Chicago, Ill., born at St. John, N.B., Dec. 30, 1880.

New Union Station for St. Paul.—The St. Paul Union Depot Co. has approved the new plans for a union station at St. Paul, Minn., and authorized the executive committee to proceed with the acquiring of land and the construction work. Plans for this union station, which involved the changing of the Mississippi River channel, were prepared over a year ago, but were vetoed by the Chief of Engineers because of improper provision for navigation requirements. The new scheme does not contemplate any change in the channel. The revised layout makes it necessary that the Great Northern, Northern Pacific, Chicago, Burlington & Quincy, Chicago, St. Paul, Minneapolis & Omaha and Chicago, Milwaukee & St. Paul railways turn in considerable land, the basis for which has already been made. Only one piece of private property remains to be taken.

Annual Passes to G.T.R. Employees.

E. J. Chamberlin, President, G.T.R., has issued the following circular:—Effective Jan. 1, 1917, meritorious or long service annual passes will be issued as follows:—To employees who have been continuously in the company's service for not less than 15 years, annual passes for themselves and, if married, to include their wives (one pass for the two persons), good over either the Eastern, Ontario or Western lines, according to the respective territory on which they may be employed. Off line employees will have the option of designating the particular territory over which their passes shall be made good. To employees who have been continuously in the company's service for not less than 20 years, annual passes for themselves and, if married, to include their wives (one pass for the two persons), good over the entire system. To head office employees who have been continuously in the company's service for not less than 15 years, annual passes for themselves and, if married, to include their wives (one pass for the two persons), good over the entire system. Ex-employees at present on the pension or superannuation funds, or who may hereafter come on those funds, will be considered, as regards length of service, the same as employees, and be accorded pass privileges as above. Female employees will be treated the same as male employees except that passes will be good for themselves only.

Snow Ploughs for Canadian Government Railways.

The 20 steel snow ploughs which Canadian Government Railways ordered recently from Canadian Car and Foundry Co., as previously stated in Canadian Railway and Marine World, will have the following dimensions, etc.:

Length, over all	32 ft. 1 9-16 in.
Width, over side sills	8 ft. 9 1/4 in.
Height, rail to top of eaves angle	11 ft. 3 in.
Height, rail to top of cupola, about	14 ft. 10 in.
Width, over wings extended	16 ft.
Extreme width, cupola	8 ft. 9 in.
Extreme length, cupola	4 ft. 11 1/4 in.
Truck centre	18 ft.
Wheel base, leader truck	4 ft. 2 in.
Wheel base, rear truck	5 ft. 3 in.
Weight, approximately	60,700 lbs.
Draft gear	Tandem springs
Couplers	5 x 7 shank, 8 1/2 in. end
Air brakes	Westinghouse, K.D. 812
Trucks (front end)	30-ton truck
Wheels	Cast steel, 28 in. diam.
Journal boxes	Tender type
Trucks (rear end)	30-ton standard
Wheels	M. C. B. 33 in.
Axles	M. C. B. standard
Brake shoes	Steel back
Springs	M. C. B. class
Brake beams	M. C. B.

The ploughs now ordered will be practically duplicate of some built some little time ago for the Intercolonial Ry., except that the large draw bar castings on the front of the plough will be extended so as to facilitate of coupling of ploughs nose to nose. The ploughs previously built did not have this feature. In addition to this modification, the side wings have been redesigned, and will have curved plates, instead of the straight plates previously used, in order that the ploughs will clear themselves more readily from the snow. The new ploughs will also have an ice cutter applied to the front truck. These cutters will be operated by air cylinders, which will remove the ice at the inside of the rails. The front operating device will also be changed and instead of being lowered and raised by air, will be raised by means of levers and springs.

Quebec Central Railway Co's Annual Report.

The annual report for the year ended June 30, 1916, signed by George Bury, President, says:—Under agreement, dated Oct. 2, 1912, approved by an Act of the Quebec Legislature, this company's property was leased to the C.P.R. Co. for 999 years, and the lease became effective Jan. 1, 1913. Interest on the ordinary stock at 4% per annum for four years from July 1, 1912, and 5% per annum in perpetuity thereafter, and interest and principal on the 4% first mortgage debenture stock, 3½% second mortgage debenture stock, and 5% third mortgage bonds, is guaranteed under the terms of the lease by the C.P.R. Co. Under the company's constitution the voting power is vested in the holders of the securities above mentioned at the rate of one vote for every £25 sterling of such stock or bonds.

Revenue Account.

Freight revenue	\$1,043,107.85
Passenger revenue	378,364.14
Mails	28,139.62
Express, miscellaneous, etc.	37,646.55
	\$1,487,258.16
Maintenance of way and structures..	\$208,266.46
Maintenance of equipment	150,602.81
Traffic expenses	27,004.37
Transportation expenses	523,804.73
General expenses	54,767.26
Taxes	18,492.76
Expenses outside operations	12,045.73
Total operating expenses	994,984.12
Balance carried to net revenue account	492,274.04

Net Revenue Account.

Balance from revenue account	\$492,274.04
Other income	16,639.78
	\$508,913.82
Interest on 4% debenture stock 12 months	117,741.61
Interest on 3½% debenture stock 12 months	57,572.66
Interest on 5% third mortgage bonds 12 months	82,246.66
Balance to surplus income account..	251,352.89

Surplus Income Account.

Balance from 1915	\$ 84,043.46
Balance net revenue account	251,352.89
	\$335,396.35
Dividend on share capital stock (4%)	\$135,264.12
Balance (per condensed balance sheet	200,132.23

Appropriation Account.

Balance (per condensed balance sheet)	200,132.23
	\$200,132.23
Appropriation for additional equipment and betterments and improvements	\$90,000.00
Transfer to reserve contingent fund..	25,000.00
Balance carried forward	85,132.23
	\$200,132.23

The principal officers are:—George Bury, President, Montreal; I. G. Ogden, Vice President, Montreal; J. H. Walsh, General Manager, Sherbrooke; H. C. Oswald, Secretary, Montreal; W. S. Fry, Treasurer; E. O. Grundy, General Freight and Passenger Agent; T. J. Maguire, Accountant; J. T. Reid, Superintendent, Sherbrooke.

The G.T.R. Barrie Division Railway Men's Patriotic Association has voted \$300 to the British Red Cross Association, \$300 to the Canadian Field Comforts Commissioner in England, and \$300 to the local branch of Field Comforts. The association has also sent \$500 to England to supply Christmas boxes for over 100 employees of the company, now on active service. Up to date, the association has contributed over \$17,000 for patriotic purposes.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were drawn.

General Order 173. Oct. 26.—Defining rates to be charged by railway companies for refrigerator cars for carriage of vegetables in carloads and rescinding orders 24680, Jan. 27, 1916, 24994, May 22, 1916, and General Order 152, Nov. 2, 1915.

25533. Oct. 13.—Amending order 25268, Aug. 14, re C.P.R. road diversion in Saskatchewan.

25534. Oct. 14.—Approving location and detail plans of G.T.R. new station at Port Colborne, Ont.

25535. Oct. 17.—Dismissing application of City of Hamilton, Ont., for order directing Hamilton Radial Ry. to carry out provisions of order 15241, Oct. 11, 1911, to extend Birch Ave. northerly to Gilkison St.

25536. Oct. 16.—Ordering Canadian Northern Ontario Ry. to build cattle pass on line with N. Lalande's lane, St. Genevieve Parish, Que.; approaches to grade crossing on west boundary of applicant's farm to be put in good shape, within 15 days from date; approaches to be maintained by C. N. O. R. and cattle pass to be completed by Dec. 1.

25537. Oct. 16.—Authorizing Saskatchewan Highway Commissioners to carry highway over west end of C.P.R. station grounds at Leslie.

25538. Oct. 17.—Authorizing Canadian Northern Ry. to build across certain highways in Tps. 7 and 6, r. 18, w. 2 m., Laurier rural municipality.

25539. Oct. 18.—Authorizing Toronto, Hamilton and Buffalo Ry. to open for traffic portion of its line between Dunnville and Port Maitland, Ont., 5.3 miles.

25540. Oct. 17.—Ordering that crossing in Riverdale Park, Toronto, be protected by flagman between 10 a.m. and 8 p.m. from May 1 to Oct. 31, each and every year; watchman appointed by Canadian Northern Ry.; wages to be paid, 25% by City of Toronto, 40% by C.N.R., 25% by C.P.R. and 10% by G.T.R.

25541. Oct. 17.—Ordering C.P.R. to appoint agent at Upper Kent, N.B., by Nov. 1, and to provide station facilities there by July 1, 1917.

25542. Oct. 17.—Relieving Canadian Northern Ry. from erecting fences, gates, and cattle guards along its line between mileage 62 and 70, and between mileage 71 and 72.7, Nipigon Tp., Ont., until land becomes settled or improved.

25543. Oct. 19.—Relieving Canadian Northern Ry. from providing further protection at first crossing west of Labroquerle station, Man.

25544. Oct. 19.—Authorizing Grand Trunk Pacific Branch Lines Co. to carry traffic over its Moose Jaw Northwest Branch between mileage 64.6 and Riverhurst, mileage 69.9; speed of trains not to exceed 15 miles an hour.

25545. Oct. 20.—Authorizing Canadian Northern Alberta Ry. to build a bridge across the Athabasca River in Sec. 1, Tp. 51, R. 26, w. 5 m.

25546. Oct. 21.—Authorizing C.P.R. to build spur 580 ft. long for A. Lesage, Ste. Therese de Blainville Parish, Que.

25547. Oct. 21.—Relieving New York Central Rd. from providing further protection at Larocque highway about 2½ miles south of Valleyfield station, Que.

25548. Oct. 21.—Relieving G.T.R. from providing further protection at Belfrey's crossing, about 3 miles east of Cornwall station, Ont.

25549. Oct. 19.—Authorizing C.P.R. to build spur for Canadian Consolidated Rubber Co. and Campbell, Wilson & Horne, Calgary, Alta.

25550. Oct. 18.—Authorizing Niagara, St. Catharines & Toronto Ry. to build trestle over its main Port Dalhousie Line, and siding for McKinnon Dash Co., St. Catharines, Ont.

25551. Oct. 20.—Approving agreement between Bell Telephone Co. and Union Telephone Co. Oct. 6.

25552. Oct. 18.—Amending order 25338, Aug. 21, re Toronto, Hamilton and Buffalo Ry. crossing of G.T.R. and Hamilton Radial Ry., Eurlington, Ont.

25553. Oct. 20.—Authorizing Grand Trunk Pacific Branch Lines Co. to build three sidings adjacent to its Moose Jaw Northwest Branch across road allowance between Secs. 25 and 26-22-7, w. 3 m., Sask.

25554. Oct. 20.—Authorizing City of Sault Ste. Marie, Ont., to build highway crossings over C.P.R. at Tancred and Francis Sts.

25555. Oct. 24.—Granting relief from provisions of order 16900, June 27, 1912. This order relating to the omission of symbols from class freight rate tariffs was published in full in Canadian Railway and Marine World for November, pg. 450.

25556. Oct. 25.—Authorizing C.P.R. to build siding for Canada Metal Co., Toronto.

25557. Oct. 24.—Authorizing Canadian Northern Ontario Ry. to build spur for Haight & Dickson Lumber Co., Wisner Tp.

25558. Oct. 20.—Ordering that crossings of highway by G.T.R. and C.P.R. at Dorval, Que., be protected by watchmen on each line between 6 a.m. and 7 p.m. daily; cost of protection reserved; watchman for C.P.R. to be appointed by C.P.R., and for G.T.R. to be appointed by Town of Dorval.

25559. Oct. 25.—Authorizing C.P.R. to build spur for Kennedy Construction Co., St. Francois de Sales Parish, Que.

25560. Oct. 24.—Amending order 25264, Aug. 15, re Canadian Northern Ry. spur to water front, Port Arthur, Ont.

25561. Oct. 20.—Approving agreement between Bell Telephone Co. and Shamrock & Renfrew Telephone Association, Renfrew, Ont., dated Apr. 1, 1913.

25562. Oct. 23.—Amending order 25256, Aug. 10, re Grand Trunk Pacific Ry. station at Riverhurst, Sask.

25563. Oct. 26.—Dismissing complaint of H. R. Moodie, Golden, B.C., against C.P.R. placing gates and fences at Second St. crossing at Golden.

25564, 25565. Oct. 25.—Approving Great Northern Ry. Standard Freight Tariffs C.R.C. 1251 and 1244, covering rates between stations on lines in B.C.

25566. Oct. 27.—Authorizing Three Rivers Traction Co., to build across C.P.R. Wayagamack spur, in Cap de la Madeleine Parish, Que., trains and cars of both companies to stop and not proceed over crossing until one of trainmen has gone ahead and signalled way clear.

25567. Oct. 25.—Authorizing G.T.R. to build two branches for Toronto-Hamilton Highway Commission, New Toronto, Ont., and to remove existing track.

25568. Oct. 25.—Approving plans and specifications of Bauslaugh Creek drain under G.T.R. in South Norwich Tp., Ont.

25569. Oct. 28.—Authorizing Canadian Northern Ry. to build interchange track for C.P.R. at Moose Jaw to cross Moose Jaw Electric Ry. at Tenth Ave.; to be protected by half interlocking plant and to build transfer track over Main St., and 10th and 11th Aves. and along Home St.

25570. Oct. 27.—Authorizing Lake Erie and Northern Ry. to build interchange track with Toronto, Hamilton and Buffalo Ry. and G.T.R. at Brantford, Ont.

25571. Oct. 26.—Amending order 25483, Sept. 29, The Canadian Northern Ry. location and building of two sidings at Port Arthur, Ont.

25572. Oct. 27.—Relieving C.P.R. from further protection at crossing of Elmhurst Ave., east of Montreal West station, Que.

25573. Oct. 24.—Approving Hull Electric Co.'s plan 150-2-2, showing standard pilots and fenders.

25574. Oct. 27.—Authorizing Canadian Northern Ry. to build extension spur from Winnipeg Transfer Ry. for J. H. Ashdown Hardware Co., Winnipeg.

25575 to 25578. Oct. 27.—Approving Bell Telephone Co. agreements with Massey Station Telephone Co., Oct. 12, 1916; Millbrook Rural Telephone Co., Oct. 14, 1916; Ardrea Telephone Association, Feb. 6, 1915, and Ontario Department of Lands, Forests and Mines, Oct. 12, 1916.

25579. Oct. 27.—Ordering G.T.R. to install improved type of automatic bell at crossing just north of milepost 109, Island Pond and Richmond Subdivision, Ascot Tp., Que.

25580. Oct. 28.—Ordering C.P.R. to erect three-car stock yard at Etzicom, Alta., by June 1, 1917.

25581. Oct. 31.—Authorizing G.T.R. to build spur for Hamilton Steel Wheel Co., Hamilton, Ont.

25582. Oct. 30.—Approving agreement between Bell Telephone Co. and Wilberforce Rural Telephone Co., Renfrew County, Ont., Oct. 19.

25583. Oct. 30.—Relieving C.P.R. from providing further protection at crossing east of Louiseville, Que.

25584. Oct. 31.—Authorizing Mount Royal Tunnel & Terminal Co. to connect temporarily with Jacques Cartier Union Ry. near Jacques Cartier Jct., mileage 5.01, from Dorchester St.

25585. Oct. 30.—Dismissing complaint of C. A. Bowlby and others of Port Medway, N.S., alleging excessive rates charged by the Halifax and South Western Ry. from Halifax to Medway station.

25586. Oct. 30.—Ordering C.P.R. to provide automatic bell at crossing of road allowance between Lots 22, Con. 1, and 22, Broken Front Concession, Darlington Tp., Ont.

25587. Oct. 31.—Authorizing C.P.R. to cross the road allowance between Secs. 33 and 34, Tp. 8, R. 30, w. 2 m., and to close road allowance in Sec. 33, Tp. 8, R. 30, w. 3 m., Sask.

25588. Oct. 31.—Authorizing Alberta Public Works Department to build highway crossing over C.P.R. in Sec. 11, Tp. 40, R. 27, w. 4 m.

25589. Oct. 31.—Authorizing G.T.R. to build extension to siding for Brown Brass Rolling Mills Co., New Toronto, Ont.

Railway Mechanical Methods and Devices.

Oxy Acetylene Welding in Montreal Tramways Co's Shops.

Oxy acetylene welding is being used to very great advantage in the Montreal Tramway's Co.'s shops at Youville, Montreal, and many worn parts and castings that would otherwise be scrapped are

to standard dimensions, although on the shaft shown in the illustrations the journal has not been touched.

Fig. 3 shows a crank case. Although they are not subject to an excessive strain, and rarely break, it will serve as an example of the many uses and odd jobs to which the welding process adapts itself. This case was cracked in two

Locomotive Flange Oiling to Save Rail Wear on Curves.

A committee report presented at the Traveling Engineer's Association's annual meeting recently calls renewed attention to the advantages of flange oiling of locomotive driving wheels in saving

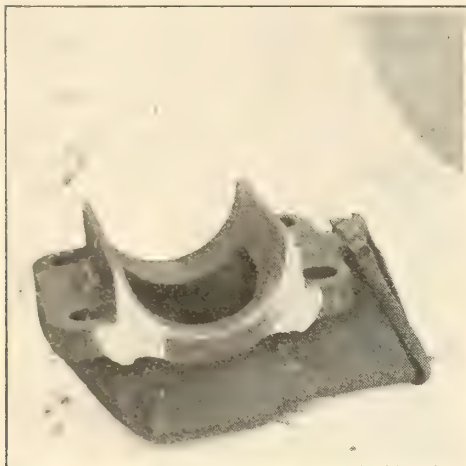


Fig. 1. Repairs to Worn Shoulder on Axle Bearing Cap.



Fig. 2. Repairs to Armature Shaft.

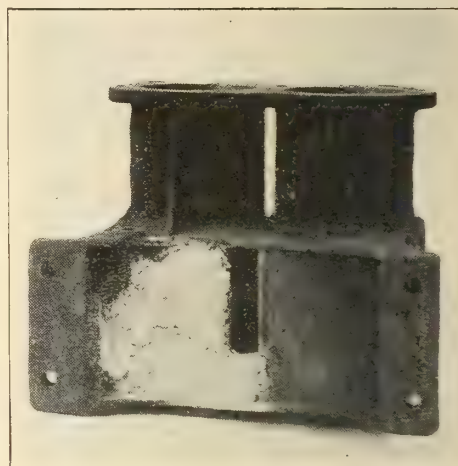


Fig. 3. Repairs to Air Compressor Crank Case.

built up, giving longer service. Fig. 1 illustrates the building up of the shoulder on an axle bearing cap which acts as a key to prevent the axle bearing from turning. From the excessive vibration to which motors are subject, these shoulders become worn, allowing the bearing to loosen. The corners are filled up with new metal and machined out to the origi-

places and a new one would have cost many times the price of repairing.

Perhaps the largest saving occurs in the repairing of truck and motor frames. These large steel castings, with a great deal of machining, are very expensive. The work shown in progress in Fig. 4 is a Westinghouse 101 motor frame, from which the long gear case lug has been broken. A new end is lined up with two bars to register the holes properly and then welded to the frame, which has previously been cut off by the torch to the correct length.

Among other routine jobs in equipment maintenance for which the welding process is used at the Youville shops are filling worn dowel holes in bearing caps, repairing cracks in motor and truck frames, renewing wearing points of steel brake heads, filling worn pedestals of

rail wear. The committee states that on the Erie Rd.'s New York, Susquehanna & Western Division the rail wear on curves has been reduced two-thirds by the use of flange oilers on the locomotives. The committee also believes it to be fully demonstrated that the flange oiler tends to prevent derailments. A number of railways reported that before applying flange oilers they had considerable trouble with wheels climbing the rails on sharp curves, but this trouble has been eliminated since flange oilers have been applied.

For success in the use of the flange oiler a very heavy asphaltum oil must be used. The oil should contain 40 to 60% of asphaltum in solution and be low in grease and paraffin. This heavy oil acts as a lubricant between the wheel flange and the head of the rail when a lighter oil would be forced out. Further than this, the heavy asphaltum sticks to the flange and will not work over on to the tread of the driving wheel, as will an oil with a paraffin base.

From an operating point of view, the saving in tire turning is even more important than the saving in rail wear. The committee estimates that the cost of tire metal used up, labor and loss of locomotive service every time a 6-driver locomotive has to go to the shop for turning tires on account of sharp flanges represents an outlay of \$219. The committee also states that where freight locomotives not equipped with flange oilers will run 9,000 to 12,000 miles before requiring shopping to have their tires turned, they will run between 25,000 and 42,000 before shopping if equipped with flange oilers. In passenger service, locomotives that have to be shopped every 15,000 to 25,000 miles should run 60,000 to 80,000 miles if equipped with flange oilers.

Foley, Welch & Stewart, railway contractors, Vancouver, B.C., have denied that they have contracted with the Russian Government for the construction of 3,000 miles of railway, as reported from Ottawa recently.

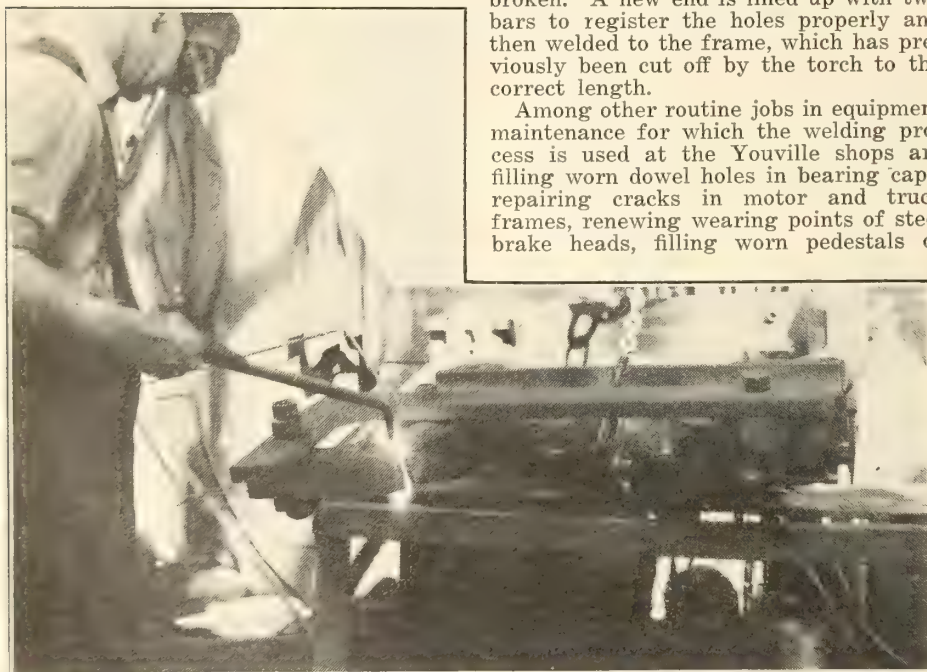


Fig. 4. Welding New Gear Case Lug on Motor.

nal dimensions, thus saving an expensive casting.

Fig. 2 shows an armature shaft on which a new pinion fit has been built up, which is a very frequent job on the older types of motors. They become worn from frequent changing of pinions, and occasionally from loose pinions. Frequently the journal also is built up and re-turned

truck and journal boxes, filling bolt holes where they have to be re-drilled. There are also many details of shop and manufacturing work which can be done by the welding process much cheaper than by any other method. We are indebted for the foregoing information and the photographs to Keith MacLeod, Engineer of Equipment, Montreal Tramways Co.

Grease Press in C.P.R. Locomotive Shop.

There are a great many places in an erecting shop where a grease press can be used, particularly where great force is required to loosen locomotive frame bolts when it is impossible to drive them out on account of lack of space. The press used in the C.P.R. locomotive shops at North Bay, Ont., which is illustrated herewith, occupies when closed $4\frac{1}{2}$ in. of space and accomplishes its purpose when bolts would otherwise have to be drilled out. For changing locomotive springs and setting rods in close quarters the press is most useful.

The body of the press is made from steel forging drilled out to dimensions shown on the accompanying illustration. The piston is of cold rolled steel, fitted

Tests of Locomotive Fuel Coal.

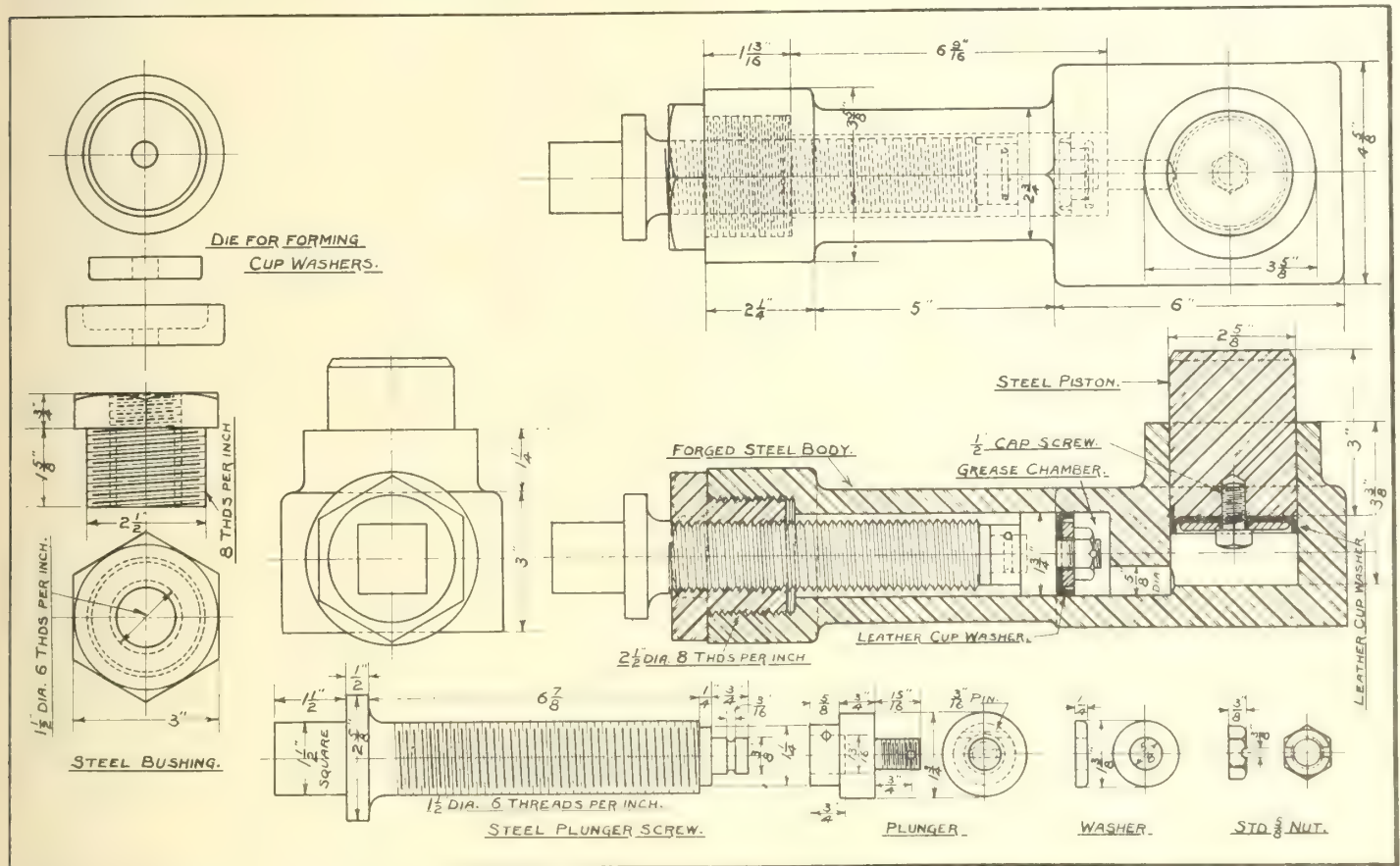
One of the largest of the mikado type of freight locomotives is being mounted in the locomotive testing laboratory, Engineering Experiment Station, University of Illinois, for an extended series of tests. The Experiment Station has entered into a co-operative arrangement with the International Railway Fuel Association and the United States Bureau of Mines to conduct tests with various sizes and grades of coal used for fuel. The Baltimore and Ohio Rd. has loaned one of its newest freight locomotives, which weighs with its tender 464,000 lbs. The testing laboratory is designed to permit the locomotive to be operated at any desired speed and at any power output, under the same conditions as prevail in practice, while its performance is recorded by

these tests will establish information which will enable a railway to determine how much it can afford to pay for the different grades and sizes of coal, and which grades and sizes will produce the best results under given operating conditions.

The Russian Government is reported to have ordered 50,000 tons of steel rails in the U.S. for the Trans-Siberian Ry.

The first G.T.R. train to run between Montreal and Toronto, arrived at Montreal, from Toronto, Nov. 27, 1856, and occupied 14 hours on the trip.

C.P.R. Office Changes in Winnipeg.—The Motive Power Department offices have been removed from Weston shops to the station, and the mechanical and fuel accounts offices have been removed from the station to Weston shops, to the rooms



Grease Press, Canadian Pacific Railway Locomotive Shop.

with leather cup washer at the bottom, and has a stroke of 3 in. The bushing in which the threaded plunger works is made of case hardened steel, because with a softer material the thread would be liable to tear out after it had become partly worn. The press described was made by Wm. Wells, General Locomotive Foreman, C.P.R., North Bay, to whom we are indebted for the foregoing information.

Timiskaming & Northern Ontario Ry.—Passenger earnings for September, \$66,762.03; freight earnings, \$95,895.19, total earnings, \$162,657.22, against \$52,238.17 passenger earnings; \$93,359.72 freight earnings; \$145,597.89 total earnings for Sept., 1915.

C.P.R. Ontario District Employees contributed another \$900 to the Toronto and York County Patriotic Fund recently, making a total of \$10,850 sent to this association since Sept., 1915.

means of automatic equipment for measuring tractive effort, water consumption, fuel consumption, smoke production and other factors which will enter into the investigations. The locomotive has 8 driving wheels, each carrying a load of 28,000 lbs., 2 pony truck wheels and 2 trailer truck wheels. It carries a steam pressure of 190 lbs. per square inch, and has a firebox 7 ft. wide and 10 ft. long, is 85 ft. long and delivers a pull or tractive effort of 54,500 lbs. at its drawbar.

Samples of coal to be used will be taken from Illinois mines and will be graded according to present commercial sizes, ranging from the so-called slack and run of mine up to the commonly used 8 x 6 lump. Later, it is contemplated, tests will be made with a coal ground to an impalpable powder or flour, which will be injected into the firebox by a specially designed blower. Tests will be made with both hand firing and automatic stoker firing. It is the expectation that

heretofore occupied by the Motive Power Department.

Railway Employees and the High Cost of Living.—A number of railway employees at North Bay, Ont., have associated together with a view to reduce the cost of food supplies by co-operation. A committee was formed to handle purchases, which were generally made in carload lots, with the result that a saving of about 30% on all commodities purchased has been made.

G.T.R. Employees in Active Military Service.—It is announced that 180 of the company's employees have been killed in action or have died from wounds received on active service. In addition several are reported missing and wounded. The total number of employees who have enlisted is over 3,000 from all grades. If any employee is killed in the course of the war, the company's insurance fund pays the same amount to his relatives, as though he had remained in his usual employment.

Railway Development, Projected Lines, Surveys, Construction Betterments, Etc.

Cascade Scenic Ry.—We are officially advised that the surveys for this projected railway have been completed, and that it is the present intention to start construction early in next spring. T. C. Deacon, M.Can.Soc.C.E., Winnipeg, is the person principally interested. (Sept. 1915, pg. 348.)

Dominion Government Ry. to Hudson's Bay.—Construction on the railway from Pas to Port Nelson, Man., is reported suspended for the winter. Track has been laid to the Kettle Rapids of the Nelson River, 330 miles from Pas. During the winter, however, work will be gone on with on the erection of the bridge at Kettle Rapids, and upon another bridge further on. It is expected to lay track to Port Nelson early next summer. Work on the terminals at Port Nelson is also reported to have been suspended for the winter. (Nov. pg. 447.)

Esquimalt & Nanaimo Ry.—R. Marpole, Vice President, E. & N.R., and General Executive Assistant, C.P.R., is reported to have said in Victoria, B.C., Nov. 11, with reference to the Johnson St. bridge matter, that the C.P.R. intended to administer the railway as it found conditions, and was not going to be driven from what was thought right by a desire to cater to Victoria civic politics. Pressure had been brought to bear upon the company to modify the terms of participation in the scheme. The company's stand had always been definite and specific and it was not its fault that there had been delays and changed policies. The question at issue has to do with the provision of general traffic facilities at the E. & N.R. Johnson St. bridge, in connection with the opening up of the Songhees reserve for railway and general purposes. The city desires that these facilities be provided, and is trying to have the matter arranged.

Grand Trunk Ry.—G. Mountain, Chief Engineer, Board of Railway Commissioners, visited Brantford, Ont., Oct. 27, to inspect several crossings over the G.T.R. which the city is desirous to have eliminated. Arrangements were made for the reduction of speed of trains at the Market St. crossing; the erection of a semaphore at the Clarence St. crossing, the maintenance of which is to be apportioned between the city and the company by the Board of Railway Commissioners; and for the putting in of a subway at the St. Paul's Ave. crossing, provided the Board decides that this is the only way protection can be given. (Nov., pg. 447.)

The timber overhead bridge at Watford, Ont., is being replaced by a steel structure. In connection with this work there is a considerable amount of grading and filling to be done.

Great Northern Ry.—A U.S. press report states that the G.N.R. is considering plans for the electrification of its lines running into Vancouver, B.C., as well as other lines in Washington. So far only an official statement has been made in respect of the lines converging on Seattle, Wash. This work is expected to take three years to carry out, and it is stated that hydro electric power will then be developed in the Hope Valley district for use on the lines converging on Vancouver.

It is expected that the company's new station building on the False Creek flats, Vancouver, will be ready for occupancy, April 1. The building is 375 ft. east of Main St., and just north of the Main St.

bridge. It is an L-shaped structure, the main building being 230 x 61 ft., and the bottom of the L being a one story building in which will be located the baggage room, mail room, express office, trainman's room, etc. East of this again will be the boiler house, which will supply heat to the whole building. The main building faces Main St., and the centre part, 100 x 60 ft., will form the general waiting room and will be the full height of the building. Each of the wings, 65 x 50 ft., will be two stories high. The ground floor will be devoted to the necessary public purposes of a terminal station, and the upper floors will be offices for the G. N. R. and the Northern Pacific Ry., which will use the building jointly. The building will be of reinforced concrete faced with pressed brick, and with terra cotta trim. The main waiting room will lead out to a covered concourse the whole length of the building, giving access to 11 sets of tracks. (Nov., pg. 447.)

Intercolonial Ry.—We are officially advised in respect to a press report that a second track was being built on the main line between Cortland St. and the National Transcontinental Ry. yard at Moncton, N.B., that what is being done can hardly be called a double tracking of the line. The line being laid is intended to be used as a switching lead between the Moncton yard and the N.T.R. yard, a distance of 2,800 ft. The work is being done by the Government Railway forces, and it is expected it will be finished by Dec. 15.

A press report states that two or three new sidings are to be laid on Ballast Wharf, St. John, N.B.

We are officially advised that the contract for the construction of the substructure of the new grain elevator at the St. John, N.B., terminals has been let to Engineers and Contractors, Ltd., Moncton, N.B. (Nov., pg. 447.)

Lachine, Jacques Cartier & Maisonneuve Ry.—Application is being made to the Dominion Parliament for an extension of time for the construction and completion of the line authorized by sec. 1, chap. 93 of the statutes of 1914. This company is a G.T.R. subsidiary, and W. H. Biggar, K.C., is solicitor for the applicants.

Pacific Great Eastern Ry.—Various reports state that track laying is being proceeded with from Clinton north-easterly, and that grading and other work is in progress from Squamish to Fort George, B.C. This is the section of the line which it is desired to complete as early as possible. Track was laid into Clinton in 1915, and trains from Squamish have since been in operation. With some small exceptions the grading was completed into Fort George. It is not, however, expected to have the track laid to Fort George this season.

A press report states that a contract has been placed in the United States for the delivery early in 1917 of 27,000 tons of steel rails.

We are officially advised that the following buildings are being erected this year:—At Squamish, locomotive repair shop, 80 x 150 ft.; frame construction with concrete pits; store houses, 60 x 80 ft., frame construction; track scales, 50 ft. platform, timber supports, concrete foundations. At Lillooet—four stall locomotive house and bunk house, 24 x 56 ft., both of frame construction. In addition to these frame section houses are to be

erected at Squamish, mileage 25.26; Mons, Pemberton, Birken, D'Arcy, Shalalth, Lillooet, Parilhon, Lough Rayment and Clinton. (Nov., pg. 447.)

Prince Edward Island Ry.—It is reported in Charlottetown, P.E.I. that it is expected to have the car ferry connection between P.E.I. and the New Brunswick mainland ready for operation by Dec. 31. The car ferry terminals are at Carleton Point, P.E.I., and Cape Tormentine, N.B. The apron at the dock at the latter point was reported practically completed Nov. 9, and everything was ready for the installation of that at Carleton. Sidings and other accommodation at Cape Tormentine are well advanced to completion, and at Carleton, both standard and narrow gauge tracks have been laid on the landing pier. The standard gauge cars will be run on to the pier, for loading and unloading to and from the P.E.I.R. narrow gauge cars during the changing of the gauge to the standard.

Peace River, McKenzie & Copper Mine River Ry.—Application is being made to the Dominion Parliament for the incorporation of a company with this title to build a railway from Sawridge, on the Edmonton, Dunvegan & British Columbia Ry., north of the east end of Lesser Slave Lake, to Buffalo Lake, thence on the south side of Peace River to Vermillion and the Chutes, crossing the river at the falls and continuing northerly to the foothills of the Caribou Mountains, then northeasterly to the Little Buffalo River, and on by the valley of that and the Salt River to Bell's Rock, on Great Slave Lake, about 50 miles. Pringle, Thompson, Burgess & Cote, Ottawa, are solicitors for the applicants.

Quebec & Saguenay Ry.—When work was stopped on this line from the point of junction with the Quebec Ry., Light & Power Co.'s Ry. at Cap Tourmente, Que., in 1912, the line was about 95% graded to Pointe au Pic, near Murray Bay, Que., 50 miles. Since that date considerable washouts and slides have occurred, and these will have to be repaired before any tracklaying can be done. The contractors are now at work on the track where these washouts and slides took place. The line being now about to become Government property, the ties for the line, to which reference was made in our November issue, are being purchased through R. W. Simpson, General Fuel and Tie Agent, Canadian Government Railways. Tenders for track and switch ties, according to the C.G. Ry.'s specifications, have been called. The construction work on the line is being carried out under the charge of A. Dick, Division Engineer, Quebec.

The line starts at Cap Tourmente, 30.5 miles from Quebec, which mileage has been acquired from the Quebec Ry., Light & Power Co., and extends to Nairn's Falls. Track has been laid on the line from Pointe au Pic to Nairn's Falls, 7.31 miles, leaving the 50 miles from Cap Tourment to Pointe au Pic to be completed. (Nov., pg. 447.)

St. John and Quebec Ry.—The section of this railway now under construction from Gagetown to Westfield, N.B., runs down the St. John River Valley, about 200 yards from the right bank of the river. The connection with the C.P.R. near Westfield is below Pamomkeag, at Westfield Beach. A supply line of railway has been built from Westfield Beach to the Nerepis River. The contractors and sub-

contractors engaged on the work are:—Kennedy and MacDonald, Westfield, N.B.; Smith and Matthew, Westfield; Poupore Brothers, Quebec; O'Gorman and Lynch, Gagetown; Loney Brothers; Chisholm and McDonald; G. Kennedy; S. Herbert Mayes, St. John, N.B.; R. Roberts and Son, St. John. (Nov., pg. 447.)

Toronto City Industrial Sidings.—A general rearrangement of industrial spur tracks in the industrial area which is being developed east of Cherry St., Toronto, under the Toronto Harbor Commissioners' plans has been approved by the Board of Railway Commissioners. The plans provide for the removal of the existing line from the corner of Lake and Cherry Streets, southerly alongside Cherry St., and easterly across the Don River to a

junction with the tracks laid under the Board of Railway Commissioners' order of Sept. 9, 1915, together with all sidings and spurs along the route. This is to be replaced by a new line, so arranged as to give one line along the front of the sites at present occupied for industrial purposes, and another along the western front of the Don diversion channel, with connecting sidings and industrial spurs. The greater part of the work is to be done at once, but provision is made for putting in two additional connections between the two frontages as they may be required upon development of the property. The total length of track covered by the plan is about two miles. E. L. Cousins is Chief Engineer and Manager for Toronto Harbor Commissioners.

Railway Rolling Stock Notes.

The C.P.R. has received 104 box cars from its Angus shops.

The Canadian Northern Ry. has received 150 box cars from Haskell & Barker Car Co.

Canadian Government Railways have received one steel sleeping car from National Steel Car Co.

The Eastern Car Co. is shipping the first delivery of 300 box cars for the Paris & Orleans Ry. of France.

The Michigan Central Rd. has received 150 steel underframes, 50 tons capacity, for flat cars, from Canadian Car & Foundry Co.

The Minneapolis, St. Paul & Sault Ste. Marie Ry. has ordered 800 box cars and 200 automobile cars from Haskell & Barker Car Co.

The Michigan Central Rd. is reported to have placed orders for 6,750 freight cars, at an approximate total cost of \$9,000,000.

The C.P.R. is said to be contemplating building or ordering some Pacific type locomotives which will be the largest in Canada.

The Delaware & Hudson Co. is in the market for 118 steel underframes for hopper cars, 25 steel underframes for stock cars and 25 for refrigerator cars.

It is reported that the Russian Government is expected to place additional contracts shortly for 400 decapod locomotives, and that about 60 of them will be built in Canada.

Sir John Eaton, Toronto, has received a new private car built by Pullman Co., Chicago. It is named Eaton, the same as his former car, which was burned some little time ago.

The Italian State Railways have ordered, in the United States, 40 consolidated locomotives, with cylinders $21\frac{1}{4}$ x $27\frac{1}{2}$ in., driving wheels $53\frac{1}{2}$ in., and a total weight, equipped with superheaters, of 147,000 lbs.

The Minister of Railways has announced that arrangements have been made for the conversion of a number of passenger cars into hospital cars for use on the Intercolonial Ry., for transporting the more serious cases of wounded soldiers from the seaboard to convalescent homes and hospitals.

Six Mallet locomotives, built by the C.P.R. at Angus shops, Montreal, 1 in 1909 and 5 in 1911, and all of which have been in service in the British Columbia mountains, are, on account of their high cost of maintenance, being rebuilt at Angus shops into 2-10-0 decapods, 2 having

been completed and 3 more being under way. Their numbers will be 5750 to 5755.

The British Government has increased to 395 an order placed in the U.S. recently for 45 narrow gauge, 4-6-0 tank locomotives, and it is reported that it is also increasing another order placed in the U.S. for 100 tank locomotives, 2-6-2 type, to make the total number to be built 200 or 250.

The Russian Government is reported to have ordered 20 decapod locomotives from Canadian Locomotive Co., 40 from American Locomotive Co., and 40 from Baldwin Locomotive Works. The enquiries originally covered 600 locomotives, and it is anticipated that further orders will be placed later.

A Paris press dispatch says the shortage of freight cars was discussed in the Chamber of Deputies, Nov. 14, when Colonel Gassouin, head of the War Ministry's railway branch, said the delivery of cars which had been ordered had been delayed, but that it was expected 2,000 cars would be received monthly. Other measures were also being taken to improve the freight car service.

The Quebec Central Ry. has ordered 100 wood box cars, 30 tons capacity, from Canadian Car & Foundry Co. They are being built at Amherst, N.S. Following are the chief details:—

Length over end sills	36 ft. 9 $\frac{3}{4}$ ins.
Width over side sills	9 ft. 0 $\frac{1}{4}$ ins.
Width inside	8 ft. 6 $\frac{1}{2}$ ins.
Length inside	36 ft.
Height, top of floor to under side of earline ..	8 ft.
Height, top of rail to top of running board	13 ft. 3 $\frac{3}{4}$ ins.
Height, top of rail to centre line of coupler	2 ft. 10 $\frac{1}{2}$ ins.
Side door opening	7 $\frac{1}{2}$ by 6 ft.
Bolsters	Simplex
Couplers	M.C.B. 5 by 5 in. shank
Draft gear	Tandem spring
Air brakes	Westinghouse
Trucks ..	30 tons standard diamond arch bar type
Wheels	M. C. B. 33 ins.
Axles	M.C.B. 4 $\frac{1}{4}$ by 3 in. journal
Journal bearings	M.C.B. lead lined
Journal boxes	M.C.B. cast iron
Brake beams	Simplex
Brake shoes	M.C.B. cast iron

The gas-electric car which the Canadian Northern Ry. is putting on the line on Vancouver Island, between Patricia Bay and Victoria, was formerly operated on the Quebec & Lake St. John Ry., between Quebec and Lake St. Joseph. It is self propelled by electric motors on the forward truck, receiving their energy direct from a 375 h.p. generator in the forward compartment of the car, direct connected to a 6 cylinder gas engine. The car is 54 ft. long, with seating capacity for 76 passengers, and it is capable of attaining a speed of 55 miles an hour. When

operating in Quebec it made four round trips daily, or a total of 175 miles, and the actual operating cost was 16c. a mile, exclusive of repairs. The car was fully described and illustrated in Canadian Railway and Marine World for April and May.

Proposed Postponement of Toronto Railway Viaduct.

A proposition was laid before the Toronto City Council recently by the railway companies interested with respect to the water front viaduct, the building of which has been directed by the Board of Railway Commissioners. It was suggested that the carrying out of the board's order be suspended for 15 years, and that certain bridges be built which would eliminate dangerous crossings. The railways state that the saving of interest charges on the cost of the construction of the viaduct for 15 years would more than pay for the work which it is proposed to do at present. At the expiration of the period the temporary bridges could be scrapped and the plans as approved by the Board of Railway Commissioners carried out.

The proposal of the Toronto Terminals Ry., which has the matter in hand for the C.P.R. and the G.T.R., was as follows:—"We will build at our own expense overhead bridges over the tracks on Bay and Yonge Sts. and connect these by a viaduct running at right angles to them on Lake St., so that the cars could run down one street and come up another, and we will also reconstruct the York St. bridge to adapt it for street railway traffic, if the city will consent to an amendment to the viaduct order striking out the time for commencing and completing the structure and all other details in connection with it."

The reason given for desiring a postponement of the work was that of financing such a big project. The erection of the new union station involves the expenditure of \$7,000,000, and money is required for other works on the different lines in Canada. It is also urged that conditions are not favorable for the city to finance the expenditure it would have to incur in connection with the carrying out of the viaduct plans.

The proposition as outlined to the city council is to build three bridges from Front St down York St., Bay St. and Yonge St., to the proposed marginal way which the Toronto Harbor Commission proposes to construct. The bridge at York St. would be a continuation of the existing structure, but the other two would be entirely new. The gradients proposed would be less than 3%.

The Timiskaming & Northern Ontario Railwaymen's Patriotic Association contributed as follows, for patriotic purposes, up to Aug. 31,—subscriptions to Red Cross, \$8,973.92; to Canadian Patriotic Fund, \$15,974.79, and donations to enlisted employees, \$7,785.43, a total of \$32,734.14. These amounts are additional to many personal subscriptions for considerable amounts made direct by members of the Commission and employees.

M.C.B. Tank Car Specifications.—Owing to labor difficulties and to delays in deliveries of materials, the Master Car Builders' Association's executive committee has extended the time for the coming into force of the Association's tank car specifications for class 3 and 4 tank cars, for 60 days, the effective date now being Mar. 1, 1917.

Mainly About Railway People Throughout Canada.

Mrs. Sinclair, wife of Angus Sinclair, railway contractor, Toronto, died there, Nov. 2, after a long illness.

Lord Shaughnessy had luncheon with the King and Queen, Nov. 21, and took his seat in the House of Lords, Nov. 23.

Lady Van Horne has closed her summer home, Covenhoven, St. Andrews, N.B., and with Miss Van Horne has returned to Montreal.

Chas. T. O'Neal, formerly Superintendent, Lehigh Valley Rd., Buffalo, N.Y., has been appointed General Superintendent at South Bethlehem, Pa.

John Smithers, a well known stock broker, who died in London, Eng., Nov. 17, aged 76, was brother of A. W. Smithers, Chairman, G.T.R.

Miss Winifred B. Goodchild, daughter of A. A. Goodchild, General Storekeeper, C.P.R., Montreal, was married there Nov. 8, to C. W. Byers, of Winnipeg.

J. Murray Gibbon, General Publicity Agent, C.P.R., gave an address on immigration and the electrical industry at the Montreal weekly electrical luncheon, Nov. 8.

H. G. Barber, formerly Resident Engineer, C.P.R., Nelson, B.C., is now a lieutenant in the 239th Battalion Overseas Railway Construction Corps, Canadian Expeditionary Force.

A. McNabb, station agent, G.T.R. Peterborough, Ont., was presented with an address and a travelling outfit by the local staff, Nov. 2, on resigning to enter private business.

Hugh Sutherland, Executive Agent, Canadian Northern Ry., Winnipeg, who has been in New York for several months past, will it is said spend the winter in Bermuda with Mrs. Sutherland.

D. B. Hanna, Third Vice President, Canadian Northern Ry., has resigned as a director of the London & Canadian Loan & Agency Co., in consequence of his many other business engagements.

A. S. Goodeve, member of the Board of Railway Commissioners, accompanied by Mrs. Goodeve, sailed for England, Nov. 9, to meet their daughter in London, on leave from nursing duties at Salonica.

Mrs. F. C. Salter, wife of the European Traffic Manager, G.T.R., and Canadian Express Co., London, Eng., arrived in Canada recently, with her two sons, the elder of whom is to complete his education in Canada.

G. W. Curtis, Industrial Agent, C.P.R., Montreal, has enlisted in the Royal Flying Corps, and will be leaving shortly for England. He has been in C.P.R. service for about 12 years, for 4 of which he was Industrial Agent at Montreal.

Lieut. T. A. Hiam, formerly secretary to Sir Donald Mann, Vice President, Canadian Northern Ry., who has been Assistant Adjutant of the 198th Battalion, Canadian Expeditionary Force, has been appointed Paymaster, with rank of Captain.

S. J. McLean, member of the Board of Railway Commissioners, has been admitted to the Ontario bar. Owing to his exceptional experience and qualifications in his capacity as commissioner, he had been exempt from serving the usual period in a legal office.

Capt. G. A. E. Bury, of Winnipeg, son of George Bury, Vice President, C.P.R., who went overseas with the 116th Light

Infantry, was for 8 months at the front, and was in June last appointed Deputy Adjutant Quartermaster General of the Training Division, has been promoted to Major.

John Hendry, at one time President, Vancouver, Westminster & Yukon Ry. Co., who died at Vancouver, B.C., recently, left an estate which was valued at about \$1,250,000, the net value being \$725,783.83. Shares held in the V.W. & Y.R., to the number of 25,020, are given as of no value.

H. McEwen, Superintendent, Prince Edward Island Ry., Charlottetown, P.E.I., has retired after 42 years service. He entered P.E.I.R. service May 14, 1875, as station master at Mount Stewart, and was appointed dispatcher in Feb., 1892, Chief Dispatcher in May, 1899, and Superintendent, May 1, 1912.

R. A. C. Young, who has been Superin-



William Phillips
Freight Traffic Manager, Eastern Lines, Canadian Northern Railway.

tendent, Canadian Northern Transfer Co., Ltd., Montreal, since its formation, and who is now a lieutenant and acting Quartermaster in the 5th Royal Highlanders first reinforcing company, was entertained at dinner in Montreal on Nov. 4 by some forty C.N.R. officials and other friends, Guy Tombs, General Freight Agent, presiding.

E. W. Delano, who has been appointed Division Engineer, Lake Superior District, Canadian Northern Railway, Capreol, Ont., was formerly Assistant District Engineer on the construction of the C.N.R. Montreal-Port Arthur line, at Port Arthur, Ont., and on completion of construction, took up engineering work in the U.S. Immediately prior to his present appointment he was in the Bangor & Aroostook Ry. Engineering Department.

Robert H. Fish, who has been appointed Superintendent, Stratford Division, Ontario Lines, G.T.R., Stratford, was born at Oakville, Ont., in 1871, and entered G.T.R. service in 1890, since when he has been, to 1900, locomotive fireman;

1900 to Oct. 1, 1908, locomotive man; Oct. 1, 1908, to Jan. 23, 1913, Road Foreman of Locomotives, London, Ont.; Jan. 23, 1913, to Nov. 14, 1916, Trainmaster, Districts 20 and 21, Ontario Lines, Brantford, Ont.

Robert Gordon Holmes, who has been appointed Assistant General Freight Agent, Western Lines, C.P.R., Winnipeg, was born there June 9, 1881, and entered C.P.R. service Sept. 5, 1898, since when he has been, to May 1, 1899, junior clerk; May 1, 1899, to Jan. 1, 1901, register clerk; Jan. 1, 1901, to Apr. 1, 1902, stenographer; Apr. 1, 1902, to Dec. 1, 1903, statistical clerk; Dec. 1, 1903, to May 1, 1905, tariff compiler; May 1, 1905, to Jan. 1, 1909, chief clerk, Tariff Bureau; Jan. 1, 1909, to Oct. 1, 1916, Chief of Tariff Bureau; all service at Winnipeg.

Charles Thomas Stanger, who has been appointed acting District Freight Agent, C.P.R., Saskatoon, Sask., was born in Rutland, Eng., May 11, 1887, and prior to coming to Canada in 1909, was for six years freight clerk at various points in England, in London & North Western Ry. service. He has been, from Mar. 1, 1909, to May 1, 1911, stenographer, C.P.R., Edmonton, Alta.; May 1, 1911, to Dec. 1, 1912, successively, rate clerk, Travelling Freight Agent, and chief clerk to District Freight Agent, C.P.R., Calgary, Alta.; Dec. 2, 1912, to Mar. 30, 1916, Travelling Freight Agent, C.P.R., Regina, Sask.

Aubrey Cecil Barker, whose appointment as acting Superintendent of Telegraph and Time Service, Intercolonial Division, Canadian Government Railways, Moncton, N.B., was announced in our last issue, was born at Lacadie, Que., Aug. 5, 1878, and entered railway service Oct. 1, 1895, since when he has been, to Apr., 1900, agent and operator, at various points, Eastern Division, C.P.R.; May, 1900, to Oct., 1913, dispatcher, and Chief Dispatcher, consecutively, Lake Superior Division, C.P.R., Chapleau, Ont.; Oct., 1913, to Oct., 1916, Inspector of Stations, Trains and Train Dispatching, Canadian Government Railways, Moncton, N.B.

Sir Eric Geddes has been appointed by the British Secretary of State for War, Director General of Military Railways. He acts as Deputy to the Quartermaster General in matters affecting transport services, and also directs and organizes such services in France under the General Officer Commanding in Chief. He was formerly Deputy General Manager of the North Eastern Ry., England, and is a Lieutenant-Colonel in the Engineer and Railway Staff Corps. A younger brother, Brigadier General A. C. Geddes, who is Director of Recruiting, was, prior to the war, Professor of Anatomy, McGill University, Montreal.

Charles Forrester, who has been appointed Superintendent, London Division, Ontario Lines, G.T.R., London, was born at Wanstead, Ont., Mar. 5, 1876, and entered G.T.R. service July 15, 1891, since when has been, to Aug. 23, 1899, operator at various points in the Middle Division; Aug. 23, 1899, to Aug. 20, 1906, dispatcher, London, Ont.; Aug. 20, 1906, to Oct. 20, 1907, Night Chief Dispatcher, London, Ont.; Oct. 20, 1907, to July 1, 1910, Chief Dispatcher, London, Ont.; July 1, 1910, to Jan. 22, 1913, Trainmaster, Stratford, Ont.; Jan. 22, 1913, to Nov. 14, 1916, Superintendent, Stratford Division, Ontario Lines, Stratford.

George R. Cunliffe, who has been appointed Superintendent, District 3, West-

ern Division, Canadian Northern Ry., Edmonton, Alta., commenced railway service as brakeman, Buffalo Division, G.T.R., and from 1882 to Mar. 1883, was brakeman, C.P.R., Winnipeg; Mar. 1883, to Sept., 1884, conductor, C.P.R., Winnipeg; Sept., 1884, to June, 1887, conductor, Port Arthur, Ont.; June, 1887, to Dec., 1892, conductor, C.P.R., Medicine Hat, Alta.; 1893 to 1898, in Great Northern Ry. service at Spokane, Wash.; 1898 to 1903, not in railway service; 1903 to Sept., 1907, conductor, Canadian Northern Ry., Winnipeg; Sept., 1907, to Nov. 1, 1916, Trainmaster, C.N.R., Brandon, Man.

R. L. Latham, Chief Engineer, Toronto, Hamilton & Buffalo Ry., Hamilton, Ont., who has also been appointed Vice President in charge of maintenance, Toronto, Hamilton & Buffalo Navigation Co., was born at Toronto, Nov. 20, 1876, and graduated in civil engineering from the School of Practical Science in 1899, taking the degree of B.A.Sc. in 1901. During portions of 1898, 1899 and 1900 he was engaged in the City Engineer's office, Toronto, and on re-location surveys for the C.P.R. Ontario Lines, and entered T.H. & B.R. service, May 1, 1901, as Assistant Engineer, which position he held until his appointment as Chief Engineer in Oct., 1909.

B. J. Farr, whose appointment as Master Mechanic, Western Lines, G.T.R., Battle Creek, Mich., was announced in our last issue, entered railway service July 1, 1893, with the Central Vermont Ry., St. Albans, Vt., as a machinist apprentice, and was subsequently Erecting Shop Foreman, Locomotive Foreman and General Foreman there, resigning in 1907 on his appointment as Master Mechanic, Northern Ry. of Costa Rica. From 1909 to 1914 he served on the Panama Ry. during the construction of the Panama Canal, and on Jan. 1, 1915, was appointed General Foreman, Western Lines, G.T.R., Battle Creek, Mich., which position he held to the date of his present appointment.

His Honor David MacKeen, Lieutenant Governor of Nova Scotia, who died at Halifax, Nov. 13, was born at Mabou, N.S., Sept. 20, 1839, and was intimately connected with commercial, banking and manufacturing interests for many years. In his early life he was agent and treasurer of the Caledonia Coal & Ry. Co., and later was General Manager of the Dominion Coal Co., resigning that position in 1896, but remaining for some time as a director. He was at various times a director of the West India Electric Co., Royal Bank, Eastern Trust Co., Dominion Iron & Steel Co., and Demarara Electric Co.; President, Halifax Electric Tramway Co., and was a Governor of Dalhousie University. He was M.P. for Cape Breton from 1887 to 1896, and a Senator from 1896.

Kenneth deSola Joseph, who has been appointed acting Assistant Superintendent, Bruce Division, Ontario District, C.P.R., Toronto was born at Quebec, Que., Oct. 6, 1892, and entered C.P.R. service May 6, 1910, since when he has been, to Aug. 31, 1912, chain man, Marquette, Man.; May 1, 1913, to Nov. 15, 1915, transportation student, following the special course of training in connection with the engineering course at McGill University, except from Nov. 1, 1913, to Apr. 1, 1914, when he was telegraph operator on the Lake Superior Division; Nov. 15, 1915, to June, 1916, Assistant Trainmaster, District 1, Atlantic Division, Brownville Jct., Me.; June to Oct. 16, 1916, acting Trainmaster, District 1, Ontario Division, Havelock, Ont.

George Stephen, who has been appointed Freight Traffic Manager, Western Lines, Canadian Northern Ry., Winnipeg, was born at Montreal, July 5, 1876, and entered railway service in 1889, since when he has been, to 1899, clerk, C.P.R.; 1899 to 1900, chief clerk to Assistant General Freight Agent, C.P.R., Winnipeg; 1900 to 1901, Travelling Freight Agent, Manitoba Lines, C.P.R.; 1901 to 1903, Contracting Freight Agent, C.P.R., Nelson, B.C.; 1903 to Jan., 1907, chief clerk to General Traffic Manager, Canadian Northern Ry., Winnipeg; Jan., 1907, to May, 1909, Assistant General Freight Agent, C.N.R., Winnipeg; May, 1909, to Dec. 31, 1915, General Freight Agent, C.N.R., Winnipeg; Jan. 1 to Nov. 6, 1916, Assistant Freight Traffic Manager, Western Lines, C.N.R., Winnipeg.

William McWood, who died at Montreal recently, after a prolonged illness, was born there in 1830, and served an apprenticeship with John Thornton, coach builder, there. He entered G.T.R. service in 1855, and from 1860 to 1873, was Fore-



Allan Purvis
General Superintendent, Ontario District, Canadian Pacific Railway.

man, Car Department. In 1873 he was appointed Assistant Mechanical Superintendent, with charge of the Car Department of the system, and continued in that position, with a change of title to Superintendent of Car Department, towards the latter end of his service, until his retirement under the provisions of the pension rules, Jan. 1, 1908, after 52 years of service. He was a member of the Master Car Builders' Association from 1875, having taken an active part in its organization. He was Vice President of the association from 1882 to 1887, and President for three successive years, 1888 to 1890.

W. M. Acworth, the English member of the commission appointed by the Dominion Government to enquire into the railway situation in Canada, is expected to arrive in Canada about the middle of December. He has visited the North American continent several times, and represented the British Government at the International Railway Congress at

Washington, D.C., in 1905; gave evidence on English railway law and practice before the Elkins committee of the U.S. Senate in the same year, and before the Hadley commission on railway statistics in 1911. As a barrister he practises considerably before the Parliamentary committees, the Railway Commission, the Light Railways Commission, etc., and he is a director of the London Underground Ry. Co., and several of its affiliated companies, as well as of the London United Tramways Co.

William A. Duff, whose appointment as Assistant Chief Engineer, Canadian Government Railways, Moncton, N.B., was announced in our last issue, was born at Hamilton, Ont., Apr. 20, 1877, and graduated from the University of Toronto in applied science in 1901. He has been, from 1901 to 1902, draughtsman and Assistant Resident Engineer, Vancouver, Victoria & Eastern Ry., in British Columbia; 1902 to 1903, Assistant Engineer, G.T.R., Hamilton, Ont.; 1903 to 1905, draughtsman, Kenwood Bridge Co., Chicago, Ill.; 1905 to 1907, draughtsman, Canadian Bridge Co., Walkerville, Ont.; 1907 to 1908, chief draughtsman, Bridge Department, National Transcontinental Ry., Ottawa, Ont.; 1908 to 1913, Assistant Bridge Engineer, National Transcontinental Ry., Ottawa, Ont.; 1913 to Oct. 1, 1916, Engineer of Bridges, Canadian Government Railways, Moncton, N.B.

John C. O'Donnell, who has been appointed Superintendent, Districts 2 and 3, Central Division, Canadian Northern Ry., Winnipeg, was born at Cobden, Ont., Dec. 17, 1879, and entered railway service, Sept. 15, 1899, since when he has been, to Sept. 1, 1901, freight brakeman, C.P.R., Chapeau, Ont.; Sept. 1, 1901, to May 1, 1902, freight conductor, C.P.R., Chapeau, Ont.; June 10, 1902, to May 1, 1905, brakeman and conductor, C.P.R., Cranbrook, B.C.; May 5 to July 2, 1905, brakeman, Canadian Northern Ry., Kamsack, Sask.; July 2, 1905, to Nov. 1, 1909, conductor, C.N.R., Battleford, Sask.; Nov. 1, 1909, to Feb. 20, 1911, Trainmaster, C.N.R., Dauphin, Man.; Feb. 20, 1911, to June 30, 1912, Trainmaster, C.N.R., Winnipeg, Man.; July 1, 1912, to July 1, 1914, Trainmaster, C.N.R., Rainy River, Ont.; July 1, 1914, to Oct. 31, 1916, Superintendent, District 3, Western Division, C.N.R., Edmonton, Alta.

William Andrew Brickman Russell, whose appointment as Commercial Agent, Grand Trunk Pacific Ry., Regina, Sask., was announced in our last issue, was born at Rednersville, Ont., Jan. 1, 1886, and entered railway service Mar. 20, 1904, since when he has been, to May 1, 1904, clerk, Local Freight Department, Central Vermont Ry., St. Albans, Vt.; May 1, 1904, to Aug. 15, 1905, secretary to General Freight Agent, same road, St. Albans, Vt.; Aug. 15, 1905, to May 1, 1908, secretary to General Freight Agent, G.T.R., Montreal; May 1, 1908, to Jan. 1, 1909, secretary to Assistant Freight Traffic Manager, Grand Trunk Pacific Ry., Winnipeg; Jan. 1, 1909, to Jan. 1, 1911, clerk, Freight Traffic Department, same road, Winnipeg; Jan. 1, 1911, to Jan. 1, 1916, chief clerk to Freight Agent, same road, Winnipeg; Jan. 1 to Oct. 1, 1916, chief clerk to Traffic Manager, Grand Trunk Pacific Ry., who is also Western Traffic Manager, Canadian Government Railways, Winnipeg.

Harry Alexander Irving, whose appointment as acting Trainmaster, District 3, Transcontinental Division, Canadian Government Railways, Graham, Ont., was announced in our last issue, was born at

Moncton, N.B., Nov. 22, 1888, and entered Canadian Government Railways service, Sept. 15, 1904, since when he has been, to Sept., 1907, clerk and stenographer, Engineering and Maintenance of Way Department, Intercolonial Ry., Moncton, N.B.; Sept., 1907, to Sept., 1908, rod man, I.R.C., Moncton, N.B.; Sept., 1908, to Oct. 1, 1910, secretary to Engineer of Maintenance, I.R.C., Moncton, N.B.; Oct. 1, 1910, to May 13, 1912, freight and passenger brakeman, I.R.C., Moncton, N.B.; May 13, 1912, to July 7, 1915, clerk and stenographer, Assistant Superintendent's Office, I.R.C., Moncton, N.B.; July 7, 1915, to Jan. 1, 1916, form clerk and acting paymaster, District 3, Transcontinental Division, Canadian Government Railways, Fort William, Ont.; Jan. 1 to Oct. 11, 1916, chief clerk to Superintendent, District 3, Transcontinental Division, C.G.R., Fort William, Ont.

H. J. Humphrey, who has been appointed Superintendent, Farnham Division, Quebec District, C.P.R., Farnham, was born at Berry's Mills, N.B., Jan. 26, 1879, and entered railway service in June 1896, since when he has been, to Aug. 1897, telegraph operator, at various points, Intercolonial Ry.; Aug. 1897 to Aug. 1901, telegraph operator, Boston & Maine Rd.; Aug. 1901 to Apr. 1902, telegraph operator, I.R.C.; May 9, 1902 to Sept. 6, 1903, telegraph operator C.P.R., Calgary, Alta.; Sept. 6, 1903 to June 1, 1907, dispatcher, C.P.R., Calgary, Alta.; June 1, 1907 to Nov. 1, 1909, dispatcher, C.P.R., Medicine Hat, Alta.; Nov. 1, 1909 to Apr. 10, 1911, dispatcher, C.P.R., Calgary, Alta.; Apr. 10, 1911 to July 1, 1912, Chief Dispatcher, C.P.R., Macleod, Alta.; July 1, 1912 to Jan. 8, 1915, Car Service and Fuel Agent, Saskatchewan Division, C.P.R., Moose Jaw; Jan. 8, 1915 to Jan. 1, 1916, Superintendent of Car Service, Western Lines, C.P.R., Winnipeg; Jan. 1 to Nov. 6, 1916, Superintendent of Car Service, Eastern Lines, C.P.R., Montreal.

George Allen Kyle, Consulting Engineer, Portland, Ore., who has been appointed Chief Engineer, Siems-Carey Railway & Canal Co., St. Paul, Minn., which is to build 1,500 miles of railway in China, was born at Tobasco, Ohio, Sept. 21, 1857. He has been engaged in railway engineering on this continent since 1876, except for three years, 1895 to 1898, spent in mining work in South Africa. From 1902 to 1904, he was Division Engineer on Construction, Grand Trunk Pacific Ry., Winnipeg, and resigned to accept special work on the Northern Pacific Ry. During 1905 and 1906, he was Engineer of Surveys and Consulting Engineer on construction with the Alaska Central Ry.; 1907 to 1909, Assistant Chief Engineer, Chicago, Milwaukee & St. Paul Ry.; 1909 and 1910, Chief Engineer, Oregon Trunk Ry., and was later appointed Vice President and General Manager, and since 1911 he has acted as a consulting engineer, specializing in reports on railway properties.

Frank W. Cooper, A.M.Can.Soc.C.E., who has resigned the position of Superintendent, Schreiber Division, Algoma District, C.P.R., Schreiber, Ont., was born at London, Ont., Feb. 16, 1880, and entered railway service in 1901, since when he has been, to 1903, draughtsman, leveller on preliminary location and construction, Algoma Central & Hudson Bay Ry., Sault Ste. Marie, Ont.; June, 1903, to Nov., 1905, transit man and Assistant Engineer, C.P.R., London and Toronto; Nov., 1905, to Nov., 1911, Resident Engineer, C.P.R., London and Toronto; Nov., 1911, to Apr., 1912, Resident Engineer, C.P.R., Montreal; Apr. to Nov., 1912, Assistant

Engineer, Chief Engineer's office, C.P.R., Montreal; Nov., 1912, to Feb., 1915, Division Engineer, Eastern Division, C.P.R., Montreal; Feb., 1915, to Nov. 1, 1916, Superintendent, District 1, Eastern Division, Farnham, Que., and since the last mentioned date he occupied the position from which he has resigned. He has been appointed Manager, Track Specialty Department, W. W. Butler Co., Montreal.

J. H. Boyle, whose appointment as General Superintendent, Quebec District, C.P.R., Montreal, during the absence of Allan Purvis at Toronto, was announced in our last issue, was born at Waterloo, Que., June 25, 1869, and entered C.P.R. service Apr. 12, 1888, since when he has been, to Aug., 1890, freight brakeman; Aug., 1890, to Nov., 1903, conductor; Nov., 1903, to Sept. 15, 1906, Trainmaster, District 1, Eastern Division, Farnham, Que.; Sept. 15, 1906, to Aug. 15, 1907, Trainmaster, District 3, Eastern Division, Montreal; Aug. 15, 1907, to Jan. 1, 1908, Trainmaster, District 2, Eastern Division, Smiths Falls, Ont.; Jan. 1 to



W. A. Duff, M.Can.Soc.C.E.
Assistant Chief Engineer, Canadian Government Railways.

May 13, 1908, Trainmaster, District 3, Eastern Division, Montreal; May 13, 1908, to Apr. 29, 1911, Assistant Superintendent, District 3, Eastern Division, Montreal; Apr. 29, 1911, to Apr., 1912, Assistant Superintendent, District 4, Eastern Division, Ottawa, Ont.; Aug., 1912, to Jan. 7, 1916, Superintendent, District 3, Lake Superior Division, Schreiber, Ont.; Jan. 7 to Oct. 26, 1916, Superintendent, District 1, Eastern Division, Farnham, Que.

T. McHattie, Master Mechanic, Eastern Lines, G.T.R., Montreal, has retired after 45 years service with the company in various capacities. He was taken seriously ill in June, and was for a time confined to his home, and later visited the Atlantic and Pacific Coasts in search of improved health, but without any great degree of success. He therefore decided to retire and take a well earned rest. He was born at Duftown, Banffshire, Scotland, Aug. 4, 1854, and entered railway

service in Oct., 1870, since when he has been, to 1878, in locomotive shops, Great Western Railway, Hamilton, Ont.; June, 1878, to Aug., 1886, locomotive man, same road; Aug., 1886, to Apr., 1889, Locomotive Foreman, G.T.R., Palmerston, Ont.; Apr., 1889, to Apr., 1898, General Foreman in charge of locomotives, same road, London, Ont.; Apr., 1898, to Jan., 1909, Master Mechanic, Eastern Division, same road, Montreal; Jan., 1909, to Apr., 1912, Superintendent of Motive Power and Car Department, Central Vermont Ry., St. Albans, Vt.; Apr., 1912, to Nov., 1916, Master Mechanic, Eastern Lines, G.T.R., Montreal.

Jules E. Morazain, who has been appointed Superintendent, District 1, Intercolonial Division, Canadian Government Railways, Levis, Que., was born at Wheatland, Que., July 31, 1875, and entered C.P.R. service May 3, 1890, since when he has been, to May 24, 1890, clerk, Drummondville, Que.; Aug. 1, 1890, to Jan. 8, 1891, operator, Foster, Que.; Jan. 9 to Aug. 12, 1891, operator, Richford, Vt.; Aug. 12, 1891, to Aug. 15, 1892, undertook a commercial course; Aug. 15 to Sept. 26, 1892, operator, Sutton, Que.; Sept. 26, 1892, to Feb. 8, 1894, operator, Highlands, Que.; Feb. 9 to July, 1894, operator, Richford, Vt.; July to Oct., 1894, relieving operator at various points; Oct., 1894, to May 27, 1895, operator, Highlands, Que.; May 27, 1895, to Sept. 24, 1901, agent, Highlands, Que.; Sept. 24, 1901, to Nov. 3, 1908, agent Mile End, Que.; Nov. 3, 1908, to Jan. 31, 1913, General Agent, Operating Department, Quebec, Que.; Feb. 1 to Dec. 6, 1913, Assistant Superintendent, District 3, Eastern Division, Quebec, Que.; Dec. 6, 1913, to May, 1916, Assistant Superintendent, Montreal Terminals; May, 1916, to Nov., 1916, Superintendent, District 1, National Transcontinental Ry., Quebec, Que.

George James Fox, who has been appointed Superintendent, Schreiber Division, Algoma District, C.P.R. Schreiber, Ont., was born at Montreal, Sept. 24, 1883, and entered C.P.R. service, June 6, 1898, since when he has been, to Jan. 6, 1901, clerk, Car Service Department, Montreal; Jan. 6, 1901, to Aug. 1, 1903, stenographer, General Superintendent's office, Montreal; Aug. 1, 1903, to Nov. 1, 1906, secretary to General Superintendent, Eastern Division, Montreal; Nov. 1, 1906, to Mar. 1, 1907, assistant chief clerk, General Superintendent's office, Montreal; Mar. 1, 1907, to Apr. 25, 1909, chief clerk to Superintendent of Terminals, Montreal; Apr. 25, 1909, to Nov. 1, 1910, chief clerk to General Baggage Agent, Montreal; Nov. 1, 1910, to Jan. 1, 1912, assistant chief clerk, General Manager's office, Western Lines, Winnipeg; Jan. 1 to Sept. 12, 1912, clerk, Vice President and General Manager's office, Winnipeg; Sept. 12 to Sept. 27, 1912, Night Yardmaster, Saskatoon, Sask.; Sept. 27, 1912, to Nov. 10, 1913, Yardmaster, Saskatoon, Sask.; Nov. 1, 1913, to July 1, 1915, General Yardmaster, Swift Current, Sask.; July 1, 1915, to Apr. 11, 1916, General Yardmaster, Fort William, Ont.; Apr. 11 to Nov. 15, Trainmaster, Winnipeg.

Edward Warren Delano, who has been appointed Division Engineer, Lake Superior Division, Canadian Northern Ry., Capreol, Ont., was born at Abbot, Me., Sept. 16, 1880, and entered railway service in June, 1902, since when he has been, to Apr., 1903, rod man and instrument man, Bangor & Aroostook Rd., Houlton, Me.; Apr. to Sept., 1903, masonry inspector, Cleveland, Cincinnati, Chicago &

St. Louis Rd., Binny, Ill.; Sept. 1903, to Mar., 1904, Chicago, Burlington & Quincy Rd., Jacksonville, Ill.; Mar., 1904, to Feb., 1905, assistant engineer and draughtsman in Real Estate and Tax Department, same road, Chicago, Ill.; Feb. to Oct., 1905, Resident Engineer, Bangor & Aroostook Rd., Frankfort, Me.; Oct., 1905, to May, 1907, Assistant Engineer, Track Elevation, Chicago, Burlington & Quincy Rd., Chicago, Ill.; May, 1907, to Feb., 1908, Resident Engineer on second track construction, Bangor & Aroostook Rd., Bangor, Me.; Apr., 1908, to May, 1909, chief of engineering party at Pennsylvania Rd., New York terminal, Westinghouse, Church, Kerr & Co.; May to Aug., 1909, Locating Engineer, Bangor & Aroostook Rd., Washburn, Me.; Aug., 1909, to Aug., 1911, Division Engineer, same road, Washburn, Me.; Sept., 1911, to Sept., 1913, Division Engineer, Sudbury-Port Arthur Line, Canadian Northern Ry.; Sept., 1913, to July, 1915, Assistant District Engineer, same road, Port Arthur, Ont.; Mar. to Nov., 1916, Pilot Government valuation party, Bangor & Aroostook Rd.

David McNicoll, who resigned from the Vice Presidency of the C.P.R., Jan. 1, 1915, died at Guelph, Ont., Nov. 26, the immediate cause of death being pneumonia. After his retirement he spent most of his time on his son's ranch in the Okanagan district, British Columbia, but returned to Montreal some two months ago and on account of his condition growing worse he was taken to the Homewood Sanitarium at Guelph in October. He was born at Arbroath, Scotland, Apr. 7, 1852, and entered railway service Aug. 20, 1866, since when he has been, to 1873, clerk, Goods Manager's office, North British Ry., in Scotland; 1873 to 1874, similar position with the Midland Ry., in England, 1874, billing clerk, Northern Ry., Collingwood, Ont.; 1874 to 1881, chief clerk, General Manager's office, Toronto, Grey & Bruce Ry.; 1882 to 1883, General Freight and Passenger Agent, Eastern and Ontario Divisions, C.P.R.; 1889 to Jan., 1896, General Passenger Agent, all lines and steamships, C.P.R.; Jan., 1896, to Apr., 1899, Passenger Traffic Manager, C.P.R., Montreal; Apr., 1899, to Apr., 1900, Assistant General Manager, C.P.R., Montreal; Apr., 1900, to Dec., 1903, Second Vice President and General Manager, C.P.R., Montreal; Dec., 1903, to Jan. 1, 1915, Vice President (Senior), C.P.R., Montreal. He was elected a director of the company in 1904, and was also appointed a member of the Executive Committee in 1906. He was also a director of Molson's Bank.

Allan Purvis, who has been appointed General Superintendent, Ontario District, C.P.R., Toronto, during J. T. Arundel's absence on account of illness, was born at Batavia, Java, June 29, 1878, and was educated at the Merchant Taylor's School, Liverpool, Eng. He entered C.P.R. service in Vancouver, B.C., at an early age, and was from Aug., 1890, to Feb., 1891, messenger, Stores Department; Feb. to Nov., 1891, storeman; Nov., 1891, to Sept., 1892, junior clerk, Vancouver, B.C.; Sept., 1892, to Aug., 1893, timekeeper, Donald, B.C.; Aug., 1893, to Oct., 1894, clerk, Vancouver, B.C.; Oct., 1894, to Mar., 1895, assistant storekeeper, North Bend and Kamloops, B.C.; Mar., 1895, to Sept., 1896, clerk and operator, Car Service and Fuel Department, Vancouver, B.C.; Sept., 1896, to Jan., 1899, Chief Clerk, Fuel Department, Vancouver, B.C.; Jan., 1899, to Feb., 1908, chief clerk to General Superintendent, Pacific Division, Vancouver, B.C.; Feb. to Nov., 1908, Su-

perintendent, District 4, Central Division, Souris, Man.; Nov., 1908, to Oct., 1909, Superintendent, District 3, Pacific Division, Nelson, B.C.; Oct., 1909, to Oct., 1911, Local Manager, Fraser Valley Branch, British Columbia Electric Ry., Vancouver, B.C.; May, 1912, to Feb., 1915, Manager of Interurban Lines, same company, New Westminster, B.C.; May, 1915, to May 1, 1916, Superintendent, District 2, Ontario Division, C.P.R., London, Ont.; May 1 to Nov. 1, 1916, General Superintendent, Eastern Division, C.P.R., Montreal.

William A. Cowan, A.M.Can.Soc.C.E., who has been appointed acting General Superintendent, Transcontinental Division, Canadian Government Railways, Cochrane, Ont., during the absence of F. P. Brady, on account of illness, was born at Galt, Ont., Jan. 22, 1877, and commenced railway service July 23, 1899, as bridge carpenter, C.P.R., London, Ont., where he remained until Sept. 25, 1901. He graduated from the School of Practical Science, Toronto, Apr. 30, 1904, and



Guy Tombs,
General Freight Agent, Eastern Lines, Canadian Northern Railway.

from May 1, 1904 to Feb. 1, 1905, was transit man C.P.R., London and Toronto; Feb. 1 to Oct. 15, 1905, Assistant Engineer of Terminals, C.P.R., Toronto; Apr. engineer, District 3, Ontario Division, C.P. 15, 1905 to Feb. 14, 1908, Resident Engineer, District 3, Ontario Division, C.P.R., Toronto; Feb. 19, 1908 to Nov. 1, 1909, Resident Engineer, District 2, Ontario Division, C.P.R., London, Ont.; Nov. 1, 1909 to Oct. 1, 1911, Resident Engineer, District 1, Eastern Division, C.P.R., Farnham, Que.; Oct. 1, 1911 to Nov. 1, 1912, Assistant Engineer, C.P.R., Montreal; Nov. 1, 1912 to Jan. 9, 1914, Superintendent, District 1, Atlantic Division, C.P.R., Brownville Jct., Me.; Jan. 10 to Mar. 15, 1914, Engineer of Construction, Halifax Ocean Terminals, Intercolonial Ry., Halifax, N.S.; Mar. 15, 1914 to May 1, 1915, Resident Engineer, District 2, Intercolonial Ry., Truro, N.S.; May 1, 1915 to Nov. 1, 1916, Division Engineer, Transcontinental Division, Canadian Government Railways, Cochrane, Ont.

William Phillips, who has been appointed Freight Traffic Manager, Eastern Lines, Canadian Northern Ry., Toronto, was born there Jan. 31, 1870, and entered transportation service Apr., 1886, since when he has been, to Mar. 31, 1896, in G.T.R. offices, Toronto; Apr. 1, 1896, to Feb. 28, 1902, Northwest Agent, Northwest Transportation Co., Winnipeg; for a portion of this time he was also General Agent, Chicago Great Western Ry., and from Apr. 1, 1900, also Northwest Agent, Northern Navigation Co.; Mar. 1, 1902, to May, 1911, General Eastern Agent, C.N.R., Toronto; in Nov., 1906, he was also appointed General Freight and Passenger Agent, Canadian Northern Ontario Ry., and in Apr., 1910, also acting Traffic Manager, Canadian Northern Steamships, Ltd., and in Apr., 1911, this last position was changed to General Freight and Passenger Agent, Canadian Northern Steamships, Ltd.; May, 1911, to May, 1912, he was General Freight Agent, Canadian Northern Ontario Ry., Central Ontario Ry., Bay of Quinte Ry., Irondale, Bancroft & Ottawa Ry., and Niagara, St. Catharines & Toronto Ry. and Navigation Cos., and also General Freight and Passenger Agent, Canadian Northern Steamships, Ltd.; May, 1912, to Nov., 1914, European Traffic Manager, C.N.R., London, Eng., and from Nov., 1914, until the recent absorption of Canadian Northern Steamships, Ltd., by the Cunard Steamship Co., European Railway and Steamship Manager, C.N.R., and Canadian Northern Steamships, Ltd.

P. J. Flynn, who resigned recently as Superintendent, Districts 2 and 3, Central Division, Canadian Northern Ry., Winnipeg, on his appointment as Superintendent, Buffalo Division, Lehigh Valley Rd., South Bethlehem, Pa., was presented with a fitted travelling bag by the office staff at Winnipeg on his leaving. He was born at Fishers, N.Y., Nov. 22, 1872, and entered railway service, Apr. 1, 1888, since when he has been, to Aug. 1, 1891, yard clerk, Lehigh Valley Rd., Buffalo, N.Y.; Aug. 1, 1891, to Apr. 1, 1892, night yardmaster, same road, Buffalo, N.Y.; Apr. 1, 1892, to Jan. 24, 1894, yardmaster, Tift Farm Yards, same road, Buffalo, N.Y.; Jan. 24, 1894, to Nov. 1, 1898, General Yardmaster, same road, Manchester, N.Y.; Nov. 1, 1898, to Apr. 1, 1901, Assistant Trainmaster, Pennsylvania Division, same road; Apr. 1, 1901, to Feb. 1, 1905, General Yardmaster, same road, Sayre, Pa.; Feb. 1 to Aug. 1, 1905, General Yardmaster, New York, New Haven & Hartford Rd., Worcester, Mass.; Aug. 1, 1905, to Feb. 1, 1907, General Yardmaster in charge of Terminals, same road, Providence, R.I.; Feb. 1, 1907, to Oct. 1, 1908, General Yardmaster in charge of Terminals, Lehigh Valley Rd., Buffalo, N.Y.; Oct. 1, 1908, to Jan. 1, 1913, Trainmaster, same road, Buffalo, N.Y.; Jan. 1, 1913, to Sept., 1915, Terminals Manager, Canadian Northern Ry., Grand Trunk Pacific Ry., and National Transcontinental Ry., Winnipeg, Man.; Sept., 1915, to Oct. 31, 1916, Superintendent, Districts 2 and 3, Central Division, Canadian Northern Ry., Winnipeg.

Railway Lands Patented.—Letters patent were issued during October, in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Calgary & Edmonton Ry.	1,591.00
Canadian Northern Ry.	842.74
Qu'Appelle, Long Lake & Saskatchewan Rd. & Steamboat Co.	1,756.00
Total	4,189.74

Canadian Northern Railway Construction, Betterments, Etc.

The Canadian Northern Quebec Ry. proposes to build a bridge on its Huberdeau extension across Rouge River, lots 25 and 32, range 1, Arundel Tp., ue., at mileage 3.33 from the junction with the C.N.Q. Ry.

Montreal Tunnel & Terminal Co.—The tunnel under Mount Royal, through which the C.N.R. will enter Montreal is finished with the exception of a small amount of the concrete lining. It is expected that that will be completed by about Jan. 15, and that the track will be laid and electrified. From the tunnel's city portal at Cathcart St. to Lagachetiere St. there are about 275,000 yards of excavation to be completed. About half of that will be taken out at first and a temporary station will be built at Lagachetiere St., which, on the permanent station's completion, will be used for express and post office purposes, etc. The temporary station's erection is expected to be started in March or April and to be completed by July, by which time the tunnel should be second tracked and fully completed. A power substation is being built at the west portal and the line from there to the Cartierville yards, 3 miles, is being electrified.

The permanent terminal station will be on Dorchester St., but this will not be erected for some time. Details of the plans for this station, which were prepared by Warren & Wetmore, New York, were given in *Canadian Railway and Marine World*, Oct., 1914, pg. 467. These plans provided for a three storey building (one storey being below the street level), of steel and concrete, having a frontage of 150 ft., and a depth along St. Monique St. of 100 ft., the front to be set back 12 ft. from the sidewalk. Seven swing doors would lead into a vestibule 21 x 100 ft., at the end of which would be the general waiting room, 60 x 100 ft. and 30 ft. high. On one side would be the baggage and express rooms, and on the other ladies' toilet rooms and men's smoking room. The remainder of the ground floor will be laid out for the company's purposes, and the operating offices will be upstairs. There would be three platforms serving six tracks, which would form part of the trackage of the permanent station. The cost of the temporary station was estimated at \$250,000. These plans may, however, be modified.

The Canadian Northern Ontario Ry. is building 100 houses for its trainmen at the following divisional points in its Lake Superior District: Brent, 6; Capreol, 40; Foleyet, 14; Hornepayne, 30; Jellicoe, 10. The houses are being built of sided timber faced three sides in the company's saw mills to 5 in. square and 6 in. square, the half round on the outside. The design of the houses is attractive, they having dormer windows on both sides of the roof with cornice carried around, making a bell-cast end. The interiors are being finished in panelled beaver board. The timber being sided with the saw makes it possible for each piece to lie close to the other, with oakum between, which makes probably the warmest house that could be built for the cold climate of Northern Ontario. The method of construction is also claimed to make the houses slow burning in case of fire.

Canadian Northern Ry.—A contract is reported to have been let to J. J. McKeown, Port Arthur, Ont., for the supply of 200,000 ties for delivery in the spring of 1917. These ties will be used for re-

placement between Port Arthur and Winnipeg.

The Saskatchewan Department of Railways announced, Nov. 3, that the C.N.R. will proceed as soon as possible with the construction of its terminals and bridges at Moose Jaw. Under the authority of chap. 12, Statutes of 1913, the Saskatchewan Government was given permission to affix a provincial guarantee to an issue of \$1,000,000 of bonds for terminal works at Moose Jaw, to include all works and equipment necessary for the same. Three bridges are necessary for the laying out of the terminals, viz., two crossing of Moose Jaw Creek, and a third at the crossing of the C.P.R. The original agreement with the Moose Jaw City Council was made in Feb., 1912, and various concessions have been made. Since the work to be done includes the construction of the Athabasca St. East station; the completion of the trestle connection between the South Hill approach and the main portion of the city, and the completion of the connection between the C.N.R. and the C.P.R. over the property owned by the city, in the vicinity of Gordon, Ironsides & Fare's abattoir. Among the concessions granted is that to construct temporary overhead trestles at Fairford and Athabasca Sts., which are to be replaced by subways within a year after the termination of the war. M. H. MacLeod, General Manager and Chief Engineer, was in Moose Jaw in consultation with the city council on the matter, Oct. 28, when the agreement was finally reached and he was in consultation with Saskatchewan Government officials at Regina prior to the government announcement.

Work is reported to have been started on the connection between the C.N.R. and the C.P.R. at Moose Jaw. This is being done by means of a spur track from the C.N.R. over property owned by the city to a connection with a spur line owned by the city and connecting with the C.P.R. The contract for this spur is reported to have been let to Riddle & Cline, Moose Jaw. The station will be built on Athabasca St., immediately east of Third Ave., on the O. B. Fysh property, and will be of brick and stone construction. A contract is expected to be let for this building at an early date.

We are officially advised that the brick-ied in boilers in the boiler house at the Saskatoon locomotive house are being replaced by three of the company's standard locomotive type boilers, each having a nominal capacity of 100 h.p.

A letter was read at the Saskatoon, Sask., Board of Trade, Oct. 27, from W. A. Brown, General Superintendent, Western Division, relative to improvements carried out or in progress on the line between Saskatoon and Drumheller, Alta., in order to handle the coal traffic. He said in part:—"The locomotive house is partly completed; one additional siding is installed, and as quickly as we can get rails, which I am taking up at Plato pit, on the Elrose subdivision, we will lay two more tracks, each with a capacity of 70 cars. In addition, we are erecting an additional water tank and stand pipe, also a new building complete for yardmaster, weighmaster and car checkers, connected with agent's office by telephone. Regarding water supply, the following improvements have been made:—One additional water tank at Drumheller, dam erected and good supply at Mecheche, also abundant supply at Hanna, new well put down

at Chinook, pipe line and reservoir now under construction, dam at Richdale repaired. This will give us an ample supply of water to handle traffic. We are also installing passing tracks at Alask, Oyen, Youngstown, Cereal, Richdale, Chinook, Craigmyle and Della; two of these sidings have been completed and in use; grading is completed for the balance and is now waiting for steel. I hope to have the additional passing tracks completed in two weeks, providing, of course, I can secure the additional labor required. We may find it necessary to take up pit tracks in a number of our ballast pits in order to get the necessary steel. We have put our roadbed in much better condition than it was at any time last season, particularly the track between Munson and Drumheller, as this has been practically rebuilt, both bridges and roadbed."

The company is erecting a machine shop and a stores building at Edmonton, Alta. The machine shop will be 119 x 61 ft. and 19 ft. high to eaves. It will have a louvred monitor 10 ft. wide, 80 ft. long and 4 ft. high running along the apex of the roof. There will be an annex at the side of the building, 22 x 11 ft., for lavatory and wash room. The walls will be of brick on concrete foundations, and the roof will be of heavy timber construction, covered with asphalt, felt and tar. The roof will be supported on heavy L beams and built up columns. The building will be steam heated and will have a clear space inside, except for one row of columns down the centre. Up to the present the machinery has been situated in one end of the locomotive house, and as more space is required for locomotives, the new shop is being built. It is not intended to buy additional machinery for this shop at present, but arrangements are being made to install electric motors instead of the steam drive hitherto employed. Electric power will be obtained from the City of Edmonton's plant.

The stores building will be 86 x 48 ft., and two stories, 27 ft. high. It is being built on concrete foundations, 7 ft. deep in the ground. The walls will be of brick and the general construction of the heavy mill type. The roof will be covered with ready roofing material. The ground floor will be divided into spaces with heavy racks for the heavier general stores supplies, which will be sorted in separate compartments in each rack; also a space for the public and men's lavatory. The first floor will be divided partly into offices for the Storekeeper, Road Foreman of Locomotives, Master Mechanic and women's lavatory, and the remainder into spaces with racks for the lighter material which will be stocked in the building. The building will have a small basement under the offices, 28 x 13 ft. It will be heated by steam. The contractors for both the machine shop and stores building are E. M. Nesbitt & Co.

The Alberta Board of Public Utility Commissioners has authorized the Canadian Northern Western Ry. to build its Oliver-Battleford branch across the highways through Tp. 59, R. 15-14 west of 4th meridian, mileage 75.83 to 88.76; also through Tp. 59, R. 13-12 west of 4th meridian, mileage 88.76 to 101.37.

Canadian Northern Pacific Ry.—Officials of the C.N.R. from Toronto, Winnipeg and other points visited the Port Mann terminals, Oct. 30. They inspected the car shops and other facilities which have been erected or are in progress. It

was reported that the machinery for the car shops had been shipped and would be installed immediately. The present installation of machinery will provide for the building of five cars a day.

It is reported that as soon as the car ferry docks at Patricia Bay, on Vancouver Island, are completed, a direct car ferry service from Port Mann will be put in operation.

Vancouver Terminals.—A large land transaction in connection with the company's terminal plans on False Creek is reported from Vancouver. The company is said to have bought 18 lots on the east side of Main St., with a total frontage of 2,000 ft., for about \$700,000. The acquiring of this property by the company

and the turning it over to the city forms part of the terms of the agreement of Feb., 1913, relative to the False Creek area.

We are officially advised that the contract for the freight offices and shed at the False Creek flats, Vancouver, has been let to McDonald, Nettleton & Bruce, Vancouver.

Vancouver Island Lines.—It was reported, Nov. 8, that tracklaying and other work had been completed on the line from Patricia Bay to Victoria, 17.5 miles, and that it was expected to be put in operation early in 1917. A gasoline electric car has been delivered for use on the line.

The car ferry slip at Patricia Bay is reported to be nearing completion.

Car Supply for Western Grain Shipments.

Sir Henry L. Drayton, Chief Railways Commissioner, gave the following judgment, Nov. 20, which was concurred in by Commissioner McLean:—

A large number of complaints have been received as to the transportation of grain on the Canadian Northern Ry. lines, to the effect that cars are scarce, and, in some instances, have not been supplied for a considerable length of time; that the elevators are, or are becoming, full; and that, in some instances, farmers are unable to market their grain.

The daily average of cars transported over the system is much lower than the result attained last year. The company states that it is doing everything it can do in hauling the traffic as quickly as possible, giving a fair proportion of the share of cars to every point. It accounts for the apparent falling off in its efficiency in a number of ways. It points out that the grain crop last year was well distributed, and that when the large movement of last year was under way it had the benefit of the short haul as well as the long haul, and that the average distance of transportation, and therefore the number of days per car that was required per load, was much less last year than this year; that this year the shorter hauls are comparatively few, and that the real traffic comes from the western portion of the territories. This, of course, itself would diminish the company's efficiency. In addition to this the company also states that the weather has not only hindered its operation, but has greatly hindered the farmer in his loading. A partial record showing the manner in which cars have been delayed at grain loading platforms has been submitted by the company as follows:—

Maon—1 car delayed 13 days.
Oberlin—1 car delayed 6 days; four cars delayed 5 days.
Lanfine—1 car delayed 8 days.
Eckville—1 car delayed 7 days.
Inland—1 car delayed 8 days.
Campbelltown—2 cars delayed 12 days.
Rosalind—1 car delayed 18 days.
Hay Lake—1 car delayed 11 days.
Vanscoy—1 car delayed 3 days; 1 car delayed 4 days.
Rosetown—1 car delayed 8 days.
Delisle—9 cars delayed 2 days; 3 cars delayed 3 days; 1 car delayed 4 days; 1 car delayed 5 days; 1 car delayed 8 days; 1 car delayed 17 days.
Zealandia—1 car delayed 3 days.
Speers—1 car delayed 2 days.
Hafford—7 cars delayed 12 days.
Forgar—1 car delayed 2 days.
Birdview—2 cars delayed 4 days; 1 car delayed 6 days; 2 cars delayed 7 days; 1 car delayed 9 days.
Girvin—1 car delayed 2 days.
Krydor—1 car delayed 3 days.
Laura—1 car delayed 4 days.
Dundurn—1 car delayed 3 days.
Strehlow—8 cars delayed 2 days; 3 cars delayed 3 days; 2 cars delayed 4 days; 3 cars delayed 6 days; 1 car delayed 12 days.

Haultain—2 cars delayed 2 days; 5 cars delayed 3 days; 1 car delayed 7 days.
Grasswood—2 cars delayed 2 days; 1 car delayed 5 days; 1 car delayed 7 days.
Saskatoon—12 cars delayed 3 days.
Elrose—1 car delayed 10 days; 1 car delayed 3 days.
Maymont—6 cars delayed 2 days; 3 cars delayed 3 days; 1 car delayed 4 days; 1 car delayed 7 days.
Findlater—2 cars delayed 3 days; 1 car delayed 4 days; 1 car delayed 6 days.
Dana—3 cars delayed 2 days.
Aberdeen—32 cars loaded over platform, 22 of these delayed 35 days over free loading.
Clarkboro—22 cars loaded over platform, 14 of these delayed 49 days over free loading.
Edam—1 car delayed 4 days; 1 car delayed 8 days.
Clyde—3 cars delayed 2 days.
Colinton—1 car delayed 4 days.
Lashburn—1 car delayed 8 days.
Minburn—1 car delayed 3 days.
Benton—1 car delayed 3 days.
Youngstown—1 car delayed 2 days.
Valley River—1 car delayed 18 days.
Gilbert Plains—3 cars delayed 2 days.
Togo—1 car delayed 6 days.
Veregin—3 cars delayed 3 days; 8 cars delayed 4 days; 2 cars delayed 5 days; 2 cars delayed 6 days; 5 cars delayed 7 days; 1 car delayed 8 days; 1 car delayed 9 days; 1 car delayed 10 days; 1 car delayed 13 days.
Mikado—6 cars delayed 2 days; 1 car delayed 3 days; 1 car delayed 6 days.
Canora—4 cars delayed 5 days.
Buchanan—2 cars delayed 2 days; 1 car delayed 3 days.
Invermay—1 car delayed 8 days.
Wadena—1 car delayed 3 days.
Kenville—1 car delayed 7 days.
Norquay—1 car delayed 5 days.
*Hawthorne—1 car delayed 13 days; 1 car delayed 32 days.
Briercrest—1 car delayed 2 days; 1 car delayed 5 days.
Mossbank—1 car delayed 7 days—case of car being ordered before grain cut.
*In the two cases at Hawthorne the same man created both delays.

The company points out that when cars are placed and a few bushels of grain put in, the company can do nothing but leave it there until the loading is completed. During the period of congestion last year the farmers largely abandoned platform loading and loaded through elevators in order to speed the movement. This is a question, however, on which the board can take no action one way or the other. The loading platform has served, and, of course, does serve, a very good end in providing the farmer with a measure of competition for the sale of his grain, which he otherwise, in many instances, would not get. The question is entirely one for him.

The company also claims that the other demands of the provinces have greatly increased, and that the freight deliveries into and out of prairie distributing centres are greatly in excess of last year, and that fair attention must be given to this traffic. Everything, however, ought to be done which can be done in order to facilitate the grain movement and each complaint has been taken up with the company to secure this end. The request has been made that the legislation of last

year, under which the board may require the company, when unable to provide facilities for the movement of grain, to furnish all facilities within its powers for the carriage of such grain to a point of interchange with another company or any terminal elevator, and requiring such other company to then complete the transportation, be put into effect. It is, of course, impossible to do this at present, for two reasons,—first, that this legislation, which was passed entirely to meet a greater emergency, only comes into operation after the close of navigation, so that the board has no jurisdiction at present to make any such order; and, secondly, for the obvious reason that the first duty of the other companies is to farmers on their lines, and that the grain on these other lines has not yet been marketed. The best results will be best obtained by the close co-operation of all interested. The railways can assist very much in seeing that cars are handled with the least possible delay, both to and from the wheat fields, and the producers can similarly assist in seeing that the cars are loaded with as little delay as possible. The board's Chief Operating Officer, Mr. Spencer, will leave today for the west with a view of further assisting the rapid movement as much as possible.

It must, of course, be recognized that car shortage is not confined to the Canadian Northern lines, nor to western territory. The complaint of car shortage in different directions is one more or less common. The Canadian Pacific, for example, has an absolute car shortage in connection with the elevator equipment. While the situation in Canada is not so acute as it is in the United States, nevertheless, the American Railway Association's figures are illustrative of general conditions. Its returns show that while at one period in 1908 there was a surplusage of over 413,000 cars, that the car surplus (which, of course, changes from time to time and becomes in certain districts a shortage), on Aug., 1916, only showed 9,762 idle cars, while there was an actual car shortage on Sept. 1 of 19,873, on Sept. 30 of 60,967, and on Nov. 1 the net car shortage was 108,010 cars. The empty car situation in Canada is aggravated by the fact that a large number of Canadian cars have not been returned by the United States to Canadian railways. The Canadian Pacific reports 24,000 cars off its system and the Canadian Northern 5,112 cars.

Conserving C.P.R. Freight Cars.—On account of the car shortage in the United States and the fact that the interchange rules are being generally disregarded there, the C.P.R. Western Lines management has issued instructions that C.P.R. cars are not to be loaded with grain for points in the U.S. The C.P.R. will, of course, supply any U.S. cars routing in the proper direction for such business.

Alaska Rates.—A Washington, D.C., press dispatch recently stated that the Interstate Commerce Commission had notified the Canadian Pacific Ry., Grand Trunk Pacific Coast Steamship Co. and Border Transportation Co. that they had been made additional parties to the investigation of the railway rates and practices in Alaska. Examiner Wilson conducted hearings at Cordova Nov. 11 and at Juneau Nov. 23, and will conclude at Seattle Dec. 4.

Canadian Railway Club.—J. S. Coffin, Jr., Canadian Sales Manager, Locomotive Pulverized Fuel Co., read a paper on pulverized fuel for locomotives on Nov. 14, in Montreal.

Canadian Pacific Ry. Construction, Betterments, Etc.

New Brunswick District.—A considerable amount of work has been done at the company's terminals at West St. John, N.B., during the past summer, making for the more expeditious handling of the winter freight business. The large piers erected in 1915 have been finally completed and many new tracks laid thereon. There is now accommodation at Sand Point for about 1,500 cars. The last of the new steamship berths has been completed, which means that it will be possible to handle 25 more steamships during the season than was possible last winter.

Quebec District.—The Montreal Board of Control has decided not to make any objection to the company erecting a wooden bridge across Notre Dame St., in place of one burned some time ago, but to reserve the right to ask for the erection of a permanent structure at some future time. The board is discussing a plan for widening the subway under the C.P.R. tracks on St. Denis St.

In order to keep pace with the increasing business the company is enlarging its yards at Smiths Falls, Ont., by adding eight new tracks to the east yard, increasing its capacity from 500 to 1,070 cars; and additional tracks in the west yard, increasing its capacity from 570 to 850 cars. A new cinder pit and additional repairing facilities are also being provided.

Manitoba District.—We are officially advised that three umbrella train platform roofs are being built at Winnipeg station, over the platforms between tracks 1 and 2, 3 and 4, and 5 and 6, their respective lengths being; No. 1, 566 ft. 7 in.; No. 2, 733 ft. 7 in.; No. 3, 877 ft. 10 in. They have the ordinary wooden roof, supported on steel pole structure. The roofs are of slow burning mill construction, 3 in. of timber, with 5 ply tar and gravel on top of it. While the clearance between the cars and the roofs will be ample, the roofs will afford adequate protection to the public. They are expected to be completed by Dec. 1.

Saskatchewan District.—Grant Hall, Vice President and General Manager, Western Lines, accompanied by General Superintendent Stevens and T. C. McNab, Resident Engineer, Moose Jaw, Sask., made a trip of inspection recently, starting from Assiniboia, on the Weyburn-Lethbridge line, through the territory between that line and the International Boundary, with a view to ascertaining the possibilities for railway construction there. The company is just completing the building of a branch from Moose Jaw to Assiniboia, the section being built extending from Vantage to the junction point. The residents of the district south of this line asked recently for railway connection and for a branch line from Aneroid, mileage 172 from Weyburn.

Alberta District.—The tracklaying on the extension of the line from Sterling, Alta., now in operation to Pakowki, mileage 75, easterly towards a connection with the western end of the line from Weyburn, Sask., at the Alberta-Saskatchewan boundary, was expected to have been completed to the Mayberries district by Nov. 30. Track had been laid to Orion on Oct. 30, and was reported completed into Manyberries, Nov. 14. Ballasting is also being done.

British Columbia District.—It is expected that some time during this month a conference will be held between the

Vancouver City Council and Grant Hall, Vice President and General Manager, Western Lines, with respect to the construction of a tunnel beneath the city. A deputation from the city council waited on F. W. Peters, General Superintendent, British Columbia District, Nov. 4, and placed the council's views before him. The matter was under consideration in 1913, when plans for a tunnel were submitted to the Railways Department, Ottawa. The suggestion is that a tunnel be constructed, starting at the inlet bluff at Burrard St., and coming out near the drill hall on Beatty St. A single track tunnel was estimated to cost about \$700,000, and a double track tunnel about \$1,000,000. Mr. Peters is reported to have informed the delegation that much of the congestion which the tunnel was originally projected to relieve had been done away with by the laying out of the new divisional yards at Coquitlam, that the company was also spending large sums of money on other improvements of its lines in Vancouver, but that the city's proposal would receive consideration.

Freight and Passenger Traffic Notes.

Vancouver, B.C., City Council has appointed Aldermen Gale and Mahon to draw up a plan for the co-operation of the city in the work of the Northern Pacific Coast Tourist Association, formed recently at Tacoma, Wash.

The Victoria, B.C., Board of Trade had a conference with J. W. Troup, Manager, B.C. Coast Service, C.P.R., on Nov. 9, for the purpose of developing an improved service between Vancouver Island and the Kootenay District. It was arranged that R. Marpole, General Executive Assistant, and H. W. Brodie, General Passenger Agent, would also meet the board to consider the matter further.

British Columbia trade reports are quoted as showing that the C.P.R. during September and October took 5,650 empty cars to points in British Columbia to carry freight to eastern points, of which 1,639 were to carry fruits and vegetables from the Okanagan Valley. Traffic on the Canadian Northern Ry. during the same months is said to have averaged 48 cars of freight a day from Port Mann, and over 70 cars a day from other points in the Fraser River Valley.

G.T.R. officials at Hamilton, Ont., report that there has been a large falling off of baskets of produce carried by passengers on the trains reaching Hamilton on market days and a corresponding increase in the number of suit cases checked as baggage. The company says the facilities for checking baggage were devised to cover personal effects only, and not market produce, and are taking steps to make the country travellers take care of their own produce or to pay express charges on it.

The G.T.R. management informed the Mayor of Hamilton, Nov. 1, that it would not provide the passenger service asked for on its line between Hamilton and Burlington Beach. The City Solicitor is looking into the whole situation from the legal standpoint, and the Mayor is reported to have said that if the company will not give a proper service, the city will take steps to recover as much as possible of the money voted as bonuses to the companies which now are part of the G.T.R. system.

Railway Finance, Meetings, Etc.

Algoma Central & Hudson Bay Ry.—It was announced recently that the receivership of the A.C. & H.B.R. was to be discharged Nov. 30. The railway made default in its bond interest, Dec. 1, 1914, and, shortly after, the Algoma Central Terminals Co. defaulted. The latter company's only source of revenue was the A.C. & H.B.R., which held its property under lease, paying an amount sufficient to cover administration expenses, taxes and bond interest, the bonds of both companies being guaranteed by the Lake Superior Corporation, which, so far, has been unable to fulfil its undertaking. Joint receivers were appointed in Feb., 1915, for the railway company, and in May, 1915, for the terminals company. To protect the rights of the bondholders of each company, an agreement was arrived at and ratified by Parliament, by which a bondholders' committee was appointed, and which is now in practical control. The revenues of both companies are paid to the committee and distributed according to the agreement. On the discharge of the receivership, certain expenses will cease and the bondholders' committee will be freed from certain formalities which a receivership imposes, but the arrangement does not absolve the Lake Superior Corporation from its obligation as guarantor of the bonds. Vivian Harcourt and T. J. Kennedy were the joint receivers appointed, the latter, however, died Aug. 29.

Central Ry. of Canada.—A general meeting of bondholders was called to be held in Montreal, Nov. 30, to consider the scheme of arrangement deposited by the directors in the Exchequer Court of Canada, to consider the company's position, and to appoint a committee to assist the directors and the trustees in preserving bondholders' interests. The company has about £850,000 of 5% bonds outstanding, in Canada, New York, Paris, and London. Interest is in arrear from Oct. 1, 1913. A London, Eng., paper says: "Apparently 58 miles of railway have been completed, of which 38 miles are leased to the G.T.R., and 380 miles were under construction, when, early in 1914, all work was suspended, pending new financial arrangements." A general contract was let for the entire line it was proposed to build between Montreal and Midland, but the only two sections which were ever brought to a construction stage were a 38 mile section from Hawkesbury to South Indian, Ont., and a 15 mile section from Ste. Agathe des Monts to Francetown, Que., and the only track laid was on a small piece from Hawkesbury westerly for 2.50 miles in 1912. Location plans were authorized early in 1913 for a piece of line from mileage 0 to 7, and revised location plans from mileage 5 to 16 in Quebec, and a subsidy contract was entered into with the Dominion Government for the construction of a line from Ste. Agathe des Monts to Howard Tp., Que., 15 miles. Early in 1913, the general contractors, C. J. Wills & Co., London, Eng., commenced proceedings against the company, claiming \$230,000 for 20 miles of line which they claimed to have built, and since then no actual construction has been done.

Temiscouata Ry.—Net earnings for July, \$4,471; for August, \$6,031; aggregate for two months ended Aug. 31, \$10,502.

White Pass & Yukon Route.—Gross earnings from Jan. 1 to Oct. 14, \$1,779,406, against \$1,434,855 for same period, 1915.

Transportation Appointments Throughout Canada.

Allan Line Steamship Co.—See under C.P.R.

Canadian Government Railways.—R. COLCLOUGH, heretofore Superintendent, District 1, Intercolonial Division, Levis, Que., has been appointed Superintendent, District 1, Transcontinental Division, vice J. E. Morazain transferred. Office, Quebec, Que.

J. E. MORAZAIN, heretofore Superintendent, District 1, Transcontinental Division, Quebec, Que., has been appointed Superintendent, District 1, Intercolonial Division, vice R. Colclough transferred. Office, Levis, Que.

W. A. COWAN, A.M.Can.Soc.C.E., heretofore Division Engineer, Transcontinental Division, Ont., has been appointed acting General Superintendent, Transcontinental Division, during the absence of F. P. Brady, on account of ill health. Office, Cochrane, Ont.

A. V. REDMOND has been appointed acting Division Engineer, Transcontinental Division. Office, Cochrane, Ont.

M. W. JENNINGS has been appointed acting Resident Engineer, District 2, Transcontinental Division. Office, Cochrane, Ont.

JOHN BIRSE, whose appointment as District Master Mechanic, District 3, Transcontinental Division, was announced in our last issue, has his office at Fort William, Ont., and not at Transcona, Man.

Canadian Northern Ry.—WILLIAM PHILLIPS, heretofore European Railway and Steamship Manager, London, Eng., has been appointed Freight Traffic Manager, Lines East of Port Arthur, Ont. Office, Toronto.

GUY TOMBS, heretofore General Freight Agent, Lines east of, and including Ottawa, Ont., has been appointed General Freight Agent, Lines East of Port Arthur, Ont. Office, Montreal.

M. A. THOMSON, heretofore City Freight Agent, Ottawa, has been appointed District Freight Agent, with territory east of North Bay, Ont., to L'Orignal, Ont., inclusive, and south to Brockville, Ont., inclusive. Office, Ottawa, Ont.

D. CROMBIE has been appointed General Superintendent, Ontario Division, which position was held by A. J. Hills until recently. Office, Toronto. The position of Superintendent of Transportation, heretofore held by Mr. Crombie, is abolished.

E. CRAWFORD, heretofore chief clerk to Superintendent of Transportation, Eastern Lines, has been appointed Superintendent of Car Service, lines east of Port Arthur, reporting to General Manager. Office, Toronto. This is a new position.

W. M. JACKLIN, heretofore Supervisor of Roadway, Port Arthur, Ont., has been appointed Inspector of Maintenance of Way, lines east of Port Arthur, reporting to General Manager. Office, Toronto. This is a new position.

E. T. AGATE, Assistant Superintendent, Lake Superior District, Capreol, Ont., having resigned, the position has been abolished.

E. W. DELANO, heretofore in Engineering Department, Bangor & Aroostook Ry., has been appointed Division Engineer, Lake Superior District, C.N.R. Office, Capreol, Ont.

GEORGE STEPHEN, heretofore Assistant Freight Traffic Manager, has been appointed Freight Traffic Manager, lines west of and including Port Arthur, Ont.,

and Duluth, Minn. Office, Winnipeg.

A. M. DAFOE has been appointed Inspector of Transportation, Winnipeg, vice H. R. Arthur transferred.

J. C. O'DONNELL, heretofore Superintendent, District 3, Western Division, Edmonton, Alta., has been appointed Superintendent, Districts 2 and 3, Central Division, vice P. J. Flynn resigned to enter another company's services. Office, Winnipeg.

C. WATTERS, heretofore in Stores Department, Brandon, Man., has been appointed Storekeeper, Dauphin, Man., vice J. H. Morgan transferred.

C. D. GLASS, heretofore Assistant Yardmaster, Port Arthur, Ont., has been appointed Trainmaster, Radville, Man., vice G. A. Cunliffe promoted.

J. E. BERRY, heretofore Yardmaster, Regina, Sask., has been appointed Yardmaster, Saskatoon, Sask.

C. R. STOKES has been appointed Car Foreman, North Regina, Sask.



C. Forrester
Superintendent, London Division, Ontario Lines,
Grand Trunk Railway.

G. MORTIMER has been appointed Locomotive Foreman, Blue River, Sask.

J. H. CRAIG, heretofore air brake tester, Edmonton, Alta., has been appointed Car Foreman, Tollerton, Alta., vice G. S. Clarke transferred.

G. S. CLARKE, heretofore Car Foreman, Tollerton, Alta., has been appointed Car Foreman, Dauphin, Man.

J. H. MORGAN, heretofore Storekeeper, Dauphin, Man., has been appointed Storekeeper, Port Mann., B.C.

H. R. ARTHUR, heretofore Inspector of Transportation, Winnipeg, has been appointed Terminal Inspector, Vancouver, B.C.

Canadian Pacific Ry.—J. S. DENNIS, Assistant to President, in charge of Natural Resources Department, has moved his office from Calgary, Alta., to Montreal.

J. H. BOYLE, heretofore Superintendent, Farnham Division, Quebec District, Farnham, has been appointed General

Superintendent, Quebec District, vice Allan Purvis, temporarily transferred to the Ontario District. Office, Montreal.

W. H. NEAL, heretofore Assistant Superintendent, Montreal Terminals Division, Quebec District, Outremont, Que., has been appointed acting Superintendent Car Service, Eastern Lines, vice H. J. Humphrey transferred. Office, Montreal.

H. J. HUMPHREY, heretofore Superintendent of Car Service, Eastern Lines, Montreal, has been appointed Superintendent, Farnham Division, Quebec District, vice J. H. Boyle transferred. Office, Farnham.

L. J. SKELLEY, heretofore chief traffic supervisor, Montreal Terminals, has been appointed Assistant Superintendent, Montreal Terminals Division, Quebec District, vice W. M. Neal transferred. Office, Outremont, Que.

R. W. SCOTT, heretofore Assistant Superintendent, Sudbury Division, Algoma District, Sudbury, has been appointed Assistant Superintendent, Trenton Division, Ontario District, vice L. G. Rogers, temporarily acting as Superintendent of that division. Office, Trenton.

ALLAN PURVIS, heretofore General Superintendent, Quebec District, Montreal, has been appointed General Superintendent, Ontario District, replacing J. T. Arundel during his absence on account of illness. Office, Toronto.

D. O. WOOD, General Freight Agent for Ontario, Allan Line Steamship Co., is also taking over the duties of Assistant Export and Import Freight Agent, C.P.R., Toronto, vice W. C. Duncan, who is being transferred to Montreal. Mr. Wood is removing his office and staff from the Allan Line office, 95 King St. West, to the C.P.R. Building, King and Yonge Sts., Toronto.

K. D. JOSEPH, heretofore Trainmaster, District 1, Ontario Division, Havelock, has been appointed acting Assistant Superintendent, Bruce Division, Ontario District, vice W. E. McGill, transferred. Office, Toronto.

W. E. MCGILL, heretofore Assistant Superintendent, Bruce Division, Ontario District, Toronto, has been appointed Assistant Superintendent, Sudbury Division, Algoma District, vice R. W. Scott transferred. Office, Sudbury, Ont.

G. J. FOX, heretofore Trainmaster, Portage Division, Manitoba District, Winnipeg, has been appointed Superintendent, Schreiber Division, Algoma District, vice F. W. Cooper resigned. Office, Schreiber, Ont.

J. TOTTON, heretofore electrician, North Transcona, Man., has been appointed Resident Electrician, Fort William, Ont., vice J. McLaughlin transferred.

R. G. HOLMES, heretofore Chief of Tariff Bureau, Winnipeg, has been appointed Assistant General Freight Agent, Western Lines. Office, Winnipeg.

W. E. ARNOLD has been appointed Chief of Tariff Bureau, Western Lines, vice R. G. Holmes promoted. Office, Winnipeg.

C. H. FOX, heretofore Assistant Division Engineer, Winnipeg, has been appointed Resident Engineer, Portage Division, Manitoba District, Winnipeg. His former position has been abolished.

G. YORK, heretofore Roadmaster, Souris Division, Manitoba District, Souris, has been appointed Roadmaster, Kenora Division, Manitoba District, Winnipeg.

J. McRAE, heretofore Roadmaster, Brandon Division, Manitoba District,

Brandon, has been appointed Roadmaster, Souris Division, Manitoba District, Souris, vice G. York transferred.

W. H. RUTHVEN, heretofore conductor, Kenora, Ont., has been appointed Trainmaster, Minnedosa, Man., vice — Fryers, transferred.

C. T. STANGER, heretofore Travelling Freight Agent, Saskatoon, Sask., has been appointed acting District Freight Agent there, vice — Cushman, who enlisted for active service with the 6th University Company, P.P.C.L.I.

P. L. NAISMITH, Manager, Department of Natural Resources, Calgary, Alta., has been appointed to the direct management of the department there, owing to the removal of J. S. Dennis, Assistant to President, to Montreal.

ALBERT MAGUIRE, heretofore chief clerk to Superintendent, Revelstoke, B.C., has been appointed Paymaster, Calgary, Alta., vice G. H. Carter.

T. LEES, heretofore Assistant Division Engineer, Calgary, Alta., has been appointed Resident Engineer, Calgary, Alta., vice R. C. Harris transferred to Edmonton, Alta.

H. H. FITZSIMMONS, heretofore conductor, Frank, Alta., has been appointed Night Yardmaster, Lethbridge, Alta., vice J. D. Murray transferred.

C. G. WASHBON, heretofore Trainmaster, Brandon, Man., has been appointed Resident Engineer, Medicine Hat, Alta.

A. MASSEY has been appointed Bridge and Building Foreman, Edmonton, Alta., vice H. Marshall.

D. MURRAY, heretofore Night Yardmaster, Lethbridge, Alta., has been appointed Night Yardmaster, Revelstoke, B.C.

J. McLAUGHLIN, heretofore Resident Electrician, Fort William, Ont., has been appointed Resident Electrician, Vancouver, B.C., vice R. Chambers, resigned.

Dominion Steel Corporation.—J. R. McISAAC, heretofore Traffic Manager, Dominion Coal Co., has been appointed General Traffic and Transportation Manager, Dominion Steel Corporation, including Dominion Coal Co., and Dominion Iron & Steel Co. Office, Sydney, N.S.

Dominion Atlantic Ry.—F. L. COREY has been appointed Trainmaster and Chief Dispatcher, vice R. B. Brown, who has been granted extended leave of absence owing to ill health. Office, Kentville, N.S.

Grand Trunk Ry.—ROSS McLENNAN, heretofore Chief Dispatcher, London, Ont., has been appointed Trainmaster, Districts 20 and 21, Ontario Lines, vice R. H. Fish, promoted. Office, Brantford, Ont.

C. FORRESTER, heretofore Superintendent, Stratford Division, comprising Districts 15, 22 and 23, Ontario Lines, Stratford, has been appointed Superintendent, London Division, comprising Districts 17, 18, 20, 21 and 24, Ontario Lines, vice W. R. Davidson, transferred. Office, London, Ont.

R. H. FISH, heretofore Trainmaster, Districts 20 and 21, Ontario Lines, Brantford, has been appointed Superintendent, Stratford Division, comprising Districts 17, 18, 20, 21 and 24, Ontario Lines, vice C. Forrester, transferred. Office, Stratford, Ont.

A. S. SHARP, heretofore Chief Dispatcher, Brantford, Ont., has been appointed Chief Dispatcher, London, Ont., vice Ross McLennan, promoted.

J. R. BRENT, heretofore dispatcher, London, Ont., has been appointed night chief dispatcher, London, Ont., vice W. B. Doherty, promoted.

W. B. DOHERTY, heretofore night chief dispatcher, London, Ont., has been

appointed Chief Dispatcher, Stratford, Ont.

W. R. DAVIDSON, heretofore Superintendent, London Division, comprising Districts 17, 18, 20, 21 and 24, Ontario Lines, London, has been appointed Superintendent, Detroit Division, comprising Durand Terminals, Districts 27, 28 and 29, and Pontiac, Oxford & Northern Ry., vice J. Caldwell. Office, Detroit, Mich.

F. B. ZERCHER, formerly Master Car Builder, Eastern Lines, C.P.R., Montreal, has been appointed Master Car Builder, Western Lines, G.T.R., vice A. Copony, resigned. Office, Elsdon, Ill.

The following station agents have been appointed: Windsor Mills, Que., C. A. Beaubien; Cornwall, Jct., Ont., S. P. Whyte; Hoards, Ont., W. B. Emmons; Hespeler, Ont., J. M. Fairweather; Edgington, Ont., F. A. Hawkshaw.

Grand Trunk Pacific Ry.—The following station agents have been appointed:—Young, Sask., M. L. Myers; Unity, Sask., G. L. Berry; Lewvan, Sask., L. Connolly; Lawson, Sask., E. D. Card; Ryley, Alta.,



K. D. Joseph,
Acting Assistant Superintendent, Bruce Division,
Ontario District, Canadian Pacific Railway.

R. L. Peckenhaugh; New Norway, Alta., D. J. Harnett; Ferintosh, Alta., H. West; Trochu, Alta., C. L. Kusler; New Hazelton, B.C., B. Catterall.

Lehigh Valley Rd.—P. J. FLYNN, heretofore Superintendent, Districts 2 and 3, Central Division, Canadian Northern Ry., Winnipeg, has been appointed Superintendent, Buffalo Division, L.V.R., vice C. T. O'Neal, promoted. Office, South Bethlehem, Pa.

Prince Edward Island Ry.—T. B. GRADY, heretofore station agent and operator, Summerside, P.E.I., has been appointed Superintendent, vice H. McEwen, who has been granted extended leave of absence prior to his retirement after about 42 years of faithful service. Office, Charlottetown, P.E.I.

Toronto, Hamilton & Buffalo Navigation Co.—R. L. LATHAM, Chief Engineer, Toronto, Hamilton & Buffalo Ry., has also been appointed Vice President, T.H. & B.N.Co., in charge of maintenance. Office, Hamilton, Ont.

Reported Purchase of Spokane International Railway by C.P.R.

A Spokane, Wash., press dispatch of Nov. 14 said "The Spokane-International Ry. has been sold to the Canadian Pacific Ry. and the Minneapolis, St. Paul & Sault Ste. Marie Ry. D. C. Corbin, President and builder of the Spokane-International, upon his return from New York yesterday, announced that negotiations between himself and his associates and Baron Shaughnessy, President, C.P.R., had been completed. The price was not made public. Mr. Corbin will continue as President of the Spokane-International, being relieved from some of his duties."

Enquiry of the C.P.R. management has failed to elicit any information as to the reported purchase, one of the officials writing:—"There is nothing whatever to be said regarding the press report referred to, which, to say the least, is premature." Our experience is that when a report is spoken of as "premature," it may generally be considered as having pretty good foundation.

The Spokane-International Ry. extends from Spokane, Wash., 140.8 miles to the International Boundary Line at Eastport, Idaho, where it connects with the C.P.R. at Kingsgate, Alta. It also has two small branches, 22.9 and 11.6 miles respectively. A through passenger and freight service is run between St. Paul and Minneapolis, Minn., via the Minneapolis, St. Paul & Sault Ste. Marie Ry. to Portal, Sask., thence via C.P.R. by way of Moose Jaw, Dunmore Jct. and Curzon Jct., to Kingsgate, Alta., and thence via Spokane-International Ry. to Spokane. The Spokane-International Ry. has 14 locomotives, 9 passenger cars and 244 freight and miscellaneous cars.

Weekly Barging of a Locomotive.—E. J. Miller contributed the following to the Railway Magazine recently:—"The C.P.R.'s British Columbia District has on one of its lines a curious piece of working. Running down to the Kootenay Lake are several lines of railway, one of which has, at present, no physical connection with any other line of the company. This particular length of railway has a mixed train running on one day of the week only. To enable the train to be run a locomotive is put on a barge and taken to the lakeside terminus by steamboat from the nearest section of the C.P.R.—and after working the train is returned by the same means. The operation involves two hours' journey on Kootenay Lake, and to transport a locomotive on a lake for the express purpose of working a train service is perhaps unique in railway operation. It would be evidently unremunerative to let the locomotive be idle for the six days to save the transit on the lake. We may add that the Lardeau Subdivision is the one referred to."

British Columbia Institute of Civil Engineers.—A number of civil engineers in British Columbia have organized under the above title and propose to apply to the Legislature for charter giving the society legal status and making it exclusively a provincial organization to which civil engineers and land surveyors may belong. It is to be independent of the provincial branches of the Canadian Society of Civil Engineers. Following are the officers, etc.:—Chairman, E. N. Horsey; Secretary Treasurer, L. Macrae; Under Secretary, F. M. Preston; Committee, Messrs. Stokes, Devey, Noakes, Mitchell, Lambert and Todd. The headquarters are in Victoria.

Canadian Railway AND Marine World

ESTABLISHED 1898

Devoted to Steam and Electric Railway,
Marine, Express, Telegraph, and Railway and Canal
Contractors' Interests.

Official Organ of various Canadian Transportation
Associations.

Published on the first of each month.

ACTON BURROWS, LIMITED - Proprietors,
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C.E.
Managing Director and Editor-in-Chief.

AUBREY ACTON BURROWS - Secretary and
Business Manager.

Associate Editors
JOHN KEIR and DONALD F. KEIR

Canadian Business Representative,
W. H. HEWITT, 70 Bond Street, Toronto

United States Business Representative,
A. FENTON WALKER, 143 Liberty St., New York

Authorized by the Postmaster General for Canada,
for transmission as second class matter.

Entered as second class matter, July 25, 1913, at the
Postoffice at Buffalo, N.Y., under the Act of Congress
of March 3, 1879.

SUBSCRIPTION PRICE, including postage any-
where, \$2 a year.

SINGLE COPIES, 20 cents each, including postage.

The best and safest way to remit is by express money
order. Where one cannot be obtained, a post office
money order, or bank draft, payable at par in Toronto,
may be sent. Cheques or drafts not payable at par in
Toronto cannot be accepted. Remittances should be
made payable to Canadian Railway and Marine World.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by
the 10th of the month preceding the date of publication.

TORONTO, CANADA, DECEMBER, 1916.

PRINCIPAL CONTENTS.

Appointments, Transportation	493
Birthdays of Transportation Men	479
Board of Railway Commissioners,—	
Orders by, Summaries of	480
Traffic orders	497
Canadian Government Railways, Snow	
Ploughs	479
Canadian Northern Ry., Construction	490
Canadian Pacific Ry., Construction	492
Roll of Honor	481
Car Supply for Western Grain	491
Electric Railway Department	499 to 501
British Columbia Electric Ry. and the Jit-	
neys	501
Finance, Meetings, Etc.	504
London & Port Stanley Ry., Cars	499
Operating results	500
Moose Jaw Electric Ry. Wages	503
Notes	504
Oshawa Ry., Electric Locomotive	500
Personal	503
Projects, Construction, Etc.	502
Public Utilities and the Public	503
Sandwich, Windsor & Amherstburg Ry.	
Wages	501
Express Companies, Among the	498
Freight and Passenger Traffic Notes	482
Government versus Private Ownership of	
Railways	473
Grain in Store at Terminal Elevators	496
Great Northern Ry. Report	478
Intercolonial Ry., St. John Elevator	478
Lake Superior Corporation's Subsidiary Trans-	
portation Companies	477
Mainly About Railway People	486
Marine Department	505 to 512
Government Vessel Building at Sorel	505
Personal	509
Sault Ste. Marie Canals Traffic	509
Shipbuilding in Canada, Customs Draw-	
back	507
The Minister of Marine on	509
Shipping Statistics	510
Toronto, Hamilton & Buffalo Navigation	
Co.'s Car Ferry	506
Quebec Central Ry. Report	480
Railway Development	484
Railway Earnings	495
Railway Finance, Meetings, Etc.	492
Railway Mechanical Methods and Devices	482
Railway Rolling Stock Notes	485
Rates, Import Freight, Application for In-	
creases	495
Tariffs, Joint, Cancellation Forbidden	496
Telegraph, Telephone and Cable Matters	498
Toronto Railway Viaduct	485

Application by Railways for Higher Import Freight Rates.

Sir Henry Drayton, Chief Railways Commissioner, gave the following judgment, Nov. 6, which was concurred in by the Assistant Chief Commissioner, D'Arcy Scott, and Commissioner McLean:—"The companies desired to materially increase their import rates, which were on a relatively low basis, but which were all rates made by the companies themselves and not imposed by the board. Treated as individual rates, they undoubtedly are low. The proposed increases were suspended by order 24440. The case has been heard and has been standing some time for judgment.

Importers claim that with high ocean rates, the burden on their traffic is already unduly heavy. Undoubtedly ocean rates are very high; but, as a matter of principle, a high ocean rate affords of itself absolutely no reason why the railways companies should be compelled, for the purpose of reducing as much as possible the traffic disability engendered by the high ocean rate, to carry imports at a probably low and unremunerative basis. On the other hand, there is no question as to the fact of high ocean rates and grave resulting difficulties for the importer.

In the Eastern Rates Case, the general rate structure was dealt with, and the whole question of railway finances and requirements of the different lines was given most careful consideration by the board. Such increases as were reasonable were authorized,—these increases in some instances being substantial. The application now made deals with a general rate schedule, and the effect of it cannot properly be measured aside from the effect of the Eastern Rates Case. The full effect of the increases there authorized is not yet apparent. Some of the higher tariffs authorized have not, indeed, been yet put into effect. The condition of the railways, while certainly not all that might be desired, is, nevertheless, much better than it was 18 months ago; and, in view of the assistance already given, no hardship will be worked against the railways in determining that no action should be taken in this case until the effect of the Eastern Rates Case judgment can be clearly demonstrated. Theoretical demonstration really amounts to nothing. The actual traffic returns alone can show what, under the new conditions as developed, the railway situation will be. I am of the opinion that the board should at the present, therefore, take no action in this application.

Railway Mechanical Conventions.—The executive committees of the American Railway Master Mechanics' Association and the Master Car Builders' Association have decided to hold the annual conventions at Atlantic City, N.J., the first named from June 13 to 16, and the latter from June 18 to 21. Strong arguments were advanced in favor of Chicago, the Chamber of Commerce offering the exclusive use of the municipal pier for the occasion.

Passenger Rate Meetings.—Meetings will be held at the Chateau Frontenac, Quebec, as follows:—Niagara Frontier Summer Rate Committee, Jan. 9, 10 and 11; Great Lakes and St. Lawrence River Rate Committee, Jan. 11; International Water Lines Passenger Association, either Jan. 10 or 11, definite date not being yet announced.

Canadian Northern Railway Earn- ings, Etc.

Gross earnings, working expenses, net earnings, increases, compared with those of 1915-16, from July 1, 1916:

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$3,834,200	\$2,636,800	\$1,197,400	\$ 711,000
Aug.	3,684,900	2,612,900	1,072,000	614,300
	\$7,519,100	\$5,249,700	\$2,269,400	\$1,325,300
Incr	\$3,573,800	\$2,248,500	\$1,325,300	

Approximate earnings for Sept., \$3,187,900; Oct., \$3,716,800; 3 weeks ended Nov. 21, \$2,563,100; against, \$2,757,000 for Sept., \$3,678,500 for Oct., and \$2,396,200 for 3 weeks ended Nov. 21, 1915.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1915-16, from July 1, 1916:

	Gross Earnings	Expenses	Net Earnings	Increase
July	\$12,247,440.39	\$8,230,348.66	\$4,017,091.73	\$1,216,688.61
Aug.	13,570,467.31	7,802,680.46	5,467,786.85	2,025,472.13
Sept.	12,134,159.96	7,004,400.80	5,129,759.16	384,458.52

\$37,652,067.66 \$23,037,429.92 \$14,614,637.74 \$3,626,719.26
Inc. \$10,682,075.22 \$7,055,455.96 \$3,626,610.26

Approximate earnings for Oct., \$13,132,000, against \$13,311,000 for Oct., 1915.

Grand Trunk Railway Earnings.

Following are the earnings and expenses for the G.T.R., including the Canada Atlantic Ry., the G.T.W.R. and D.H.G. & M.R., for September, compared with those for September, 1915:—

Grand Trunk Railway.			
	1916.	1915.	
Earnings ..	\$4,617,000	\$3,667,800	
Expenses ..	3,099,000	2,501,100	
Net earnings	\$1,518,000	\$1,176,700	
Grand Trunk Western Railway.			
	1916.	1915.	
Earnings ..	\$ 744,200	\$ 669,900	
Expenses ..	615,300	445,200	
Net earnings	\$ 128,900	\$ 224,700	
Detroit, Grand Haven & Milwaukee Ry.			
	1916.	1915.	
Earnings ..	\$ 275,600	\$ 257,300	
Expenses ..	296,600	192,150	
Net earnings	\$ 21,000—	\$ 65,150	

Approximate earnings for Oct., \$5,651,321, and for 3 weeks ended Nov. 21, \$3,731,151, against \$4,666,691 for Oct., and \$2,894,364 for 3 weeks ended Nov. 21, 1915.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1 to Oct. 31.—

	1916.	1915.	Increase.
G.T.R.	\$39,127,270	\$33,045,502	\$6,081,768
G.T.W.R.	7,781,671	6,241,222	1,540,449
D.G.H. & M.R.	2,761,787	2,272,021	489,766
	\$49,670,728	\$41,558,745	\$8,111,983

Grand Trunk Pacific Railway Earn- ings.

The approximate earnings for the Prairie Section, 916 miles, for Oct., were \$566,503, against \$973,581; and from July 1 to Oct. 31, \$1,643,008, against \$1,858,557 for same period 1915.

Rogers Pass Tunnel Suit.—Argument in Foley, Welch & Stewart's appeal against the assessment of damages at \$576,155.99 in the suit brought by McIlwee & Son was begun in the British Columbia Court of Appeal, Nov. 8. A condition of the granting of permission to appeal was that Foley, Welch & Stewart should deposit in the court \$600,000 to cover judgment and costs.

Attempt to Remedy Car Shortage.—The American Railway Association has adopted a per diem charge, ranging from 45c to \$1.25, for each freight car which any one road shall withhold from another, and imposes a penalty on any road which violates the association's rules relating to car shortage.

Cancellation of Joint Tariffs Forbidden by Board of Railway Commissioners.

The Chief Railways Commissioner issued the following memorandum, Nov. 11, which was concurred in by Commissioner McLean:—Mr. Hardwell, the board's Chief Traffic Officer, has had the question of joint rates up with the railway companies for some time past. He reports that both the Grand Trunk and Canadian Pacific Railways have filed a large number of new joint tariffs, many of which are free from objection; but, he also reports that both these railway companies in tariffs which they have filed are cancelling joint rates without substituting any new joint rates for the rates cancelled.

Under the act, the duty is thrown on companies of filing joint tariffs to cover transportation in cases where the movement over two or more companies is necessary in order to establish a continuous route and through billing. It is to be noticed that the companies are practically only cancelling joint tariffs without submitting new ones in so far as connections with the Canadian Northern System are concerned. Joint rates must be given by both the Grand Trunk and Canadian Pacific Railways to Canadian Northern points. In like manner, the Canadian Northern has cancelled joint tariffs applicable to points on the systems of the other two lines. The same duty, of course, rests on the Canadian Northern—it must maintain joint tariffs between its line and proper points on the other two systems.

An order will go disallowing all notices of cancellation of joint freight tariffs which have not been superseded by other joint freight tariffs duly filed with the board and applicable between the same points and to the same classes of traffic. This order should not be applicable to joint rates which may have been necessary under the former system of railway construction, but which have by reason of present construction become unnecessary. In other words, no joint rate, under the act, is required by the act for a movement covered by the rates of a single carrier by an existing reasonable and practicable route between the same points, and applicable to the same classes of traffic, or by the rates over a new joint route, which is also reasonable and practicable. For example, a shipment from Picton, Ont., to Cobalt, Ont., formerly moved over the Central Ontario to connection with the Grand Trunk or Canadian Pacific, and thence to North Bay, where connection was made with the Timiskaming & Northern Ontario, running into Cobalt, necessitating a joint rate in which at least three carriers participated and two transfers. Today, the Central Ontario, being part of the Canadian Northern System, the Canadian Northern itself can carry the traffic from Picton and make a direct connection with the Timiskaming & Northern Ontario. A joint tariff, in this instance, is only necessary as between the Canadian Northern and the Timiskaming & Northern Ontario Railways, and the action of the Canadian Northern in cancelling a tariff in which the intermediate haul is enjoyed by either the Grand Trunk or Canadian Pacific, is justified.

The cancellations are become effective on Dec. 1. No cancellation will be allowed unless a substituted tariff then takes effect, covering the same service, either by reason of a single haul or by a new reasonable joint traffic route. No formal

order need today go, and opportunity will be given the different companies to show which of the cancellations are in conformity with the principles above stated. The matter will be set down for hearing at Ottawa, Nov. 21, when any cancellation, the effect of which may be in doubt, can be discussed.

The Chief Commissioner gave the following judgment, Nov. 22, which was concurred in by the Assistant Chief Commissioner, D'Arcy Scott, and Commissioner McLean:—A memorandum was issued by the board on Nov. 00, taking cognizance of a large number of cancellations of joint freight rates filed by the Grand Trunk, Canadian Pacific and Canadian Northern Railways. The effect on traffic of the different cancellations was that the traffic henceforth would move at the sum of the locals, involving considerably higher rates. The board intimated that the action was objectionable and would not be allowed, and the question was set down for hearing at the sittings at Ottawa on Nov. 21, so that the different cancellations could be discussed and those ascertained which were objectionable.

A large number of cancellations were shown at the hearing to have been filed. Many movements are affected. As intimated at the hearing, joint rates and services must be maintained. While rates based on the sum of the locals would work a discrimination as against the traffic affected, yet the joint rates which supply in the future in like manner should be joint rates predicated upon the increases already authorized by the board in the Eastern Rates Case. No other increases should be allowed. The different companies, instead of being galled to do business on the sum of the locals, should be ordered to file with the board, not later than Nov. 27, to become effective Dec. 1, supplements to the joint class freight tariffs now in effect, providing rates which must not exceed those at

present in effect by more than the maximum of 2c per 100 lbs., in the 1st class. In so far as other classes are concerned, the rates must be proportioned to the 1st class rates as increased by such a maximum, in accordance with the standard maximum mileage tariff approved by the board for the use of the companies, with a result, for example, that the increases in so far as rates applicable to 5th class commodities are concerned, cannot be increased over a maximum of 1c per 100 lbs.

Order 25656, issued in connection with this matter, is given on another page under "Traffic Orders by the Board of Railway Commissioners."

Express Traffic Association of Canada.

At the Association's semi-annual meeting at Toronto, Nov. 21 and 22, John Pullen, President of the Canadian Express Co., Montreal, was elected Chairman, succeeding W. H. Burr, Traffic Manager, Dominion Express Co., whose resignation has been before the association for some months.

The articles of organization were amended and plans adopted for increasing the scope of the association's work, which will require the services of a secretary, who will devote his entire time to association matters. C. Ham, who has been chief clerk in the Dominion Express Co.'s Traffic Department for the past six years, has been appointed Secretary of the association. He was formerly connected in the Intercolonial Ry. Traffic Department and also in the Board of Railway Commissioners and the C.P.R. service at different times.

The Fort William Elevator Co. has been authorized to increase its capital stock from \$500,000 to \$1,000,000.

Grain in Store at Terminal Elevators, Interior Terminal Elevators and at Public Elevators in the East.

Week ending Nov. 11, 1916.	Wheat.	Oats.	Barley.	Flax.	Totals.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
Port William—					
C.P.R.	1,219,516	478,136	106,950		1,804,602
Consolidated Elevator Co.	943,962	200,472	49,106	85,484	1,279,024
Empire Elevator Co.	664,465	288,428	58,272	115,993	1,127,158
Ogilvie Flour Mills Co.	911,875	209,955	63,470		1,185,300
Western Terminal Elevator Co.	1,073,195	244,046	31,086	96,651	1,444,978
G. T. Pacific	1,386,425	899,947	76,951	51,436	2,414,759
Grain Growers' Grain Co.	1,234,738	593,846	101,309		1,929,893
Fort William Elevator Co.	651,753	452,550	32,733	13,157	1,150,193
Eastern Terminal Elevator Co.	510,136	181,674	13,704		705,514
Port Arthur—					
Port Arthur Elevator Co.	2,009,094	1,125,975	276,692	84,635	3,497,296
D. Horn & Co.	232,414	79,729	41,512	92,472	446,127
Dominion Government Elevator	731,380	305,565	72,756	73,047	1,232,748
Thunder Bay Elevator	666,625	289,150	69,850	32,257	1,057,882
Total terminal elevators	12,286,478	5,349,473	994,391	645,132	19,275,474
Calgary Dom. Govt. Elev.	148,163	32,640	2,621	86	183,510
Saskatoon Dom. Govt. Elev.	42,829	11,295	856	453	55,433
Moose Jaw Dom. Govt. Elev.	256,672	53,944	8,992	2,705	322,313
Total interior terminal elevators	447,664	97,879	12,469	3,244	561,256
Midland—					
Aberdeen Elevator Co.	307,679	1,341			309,020
Midland Elevator Co.	29,961	493,858			523,819
Tiffin, G.T.P.	1,085,514	317,744	127,175		1,430,433
Port McNicol	1,643,991	736,216	40,973		2,241,180
Goderich Elevator and Transit Co.	393,604	535,255		7,628	936,847
Kingston—					
Commercial Elevator Co.	10,327	69,771			80,098
Port Colborne	549,312	941,448			1,490,760
Montreal—					
Harbor Commissioners no. 1	911,298	2,104,989	211,217	5,985	3,233,489
Harbor Commissioners no. 2	545,000	1,072,131	139,671		1,756,802
Montreal Warehousing Co.	466,906	1,732,733	32,242	24,948	2,256,829
Quebec Harbor Commissioners	26,205	184,217		*12,304	222,726
West St. John, N.B.	126,129	644,403	69,497		843,029
Total public elevators	6,098,926	8,834,106	620,775	*12,304 88,561	15,604,672
Total quantity in store	18,833,068	14,281,458	1,627,635	*12,304 686,937	35,441,402
*Corn.					

Traffic Orders by the Board of Railway Commissioners.

Stop-off Charges on Canned Goods.

25527. Oct. 13.—Re complaint of Dominion Cannery, Ltd., of Hamilton, Ont., against proposed increase in stop-off charges on canned goods, in carloads, from \$3 to \$5 a car. Upon hearing the complaint at Toronto, Ont., the complainants, the Canadian Manufacturers' Association, the Canadian Freight Association, the Grand Trunk and the Canadian Northern Railways, and the Wabash and the Michigan Central Railroads being represented, it is ordered that the said proposed increase in the charge for stopping cars containing part carloads of canned goods in transit for completion of loads be disallowed.

Great Northern Ry. Freight Tariffs.

25564 and 25565. Oct. 25. Granting applications of Great Northern Ry., under section 327 of the Railway Act, for approval of its Standard Freight Tariffs C.R.C. nos. 1244 and 1251, showing rates between stations on lines in British Columbia.

Transfer Track at Moose Jaw.

25569. Oct. 28. Re application of Canadian Northern Ry., under sections 227 and 237 of the Railway Act, for authority to construct a transfer track between its railway and the C.P.R. at Moose Jaw, Sask., as shown on plan dated Winnipeg, June 27, 1916. Upon hearing the application at Moose Jaw, July 12, 1916, the applicant company, the C.P.R., the City of Moose Jaw, the Village of Avonlea, and the Boards of Trade of Moose Jaw, Rosetown, Radville, and Forward being represented; and upon the report of an engineer of the Board, it is ordered that the Canadian Northern be authorized and directed to construct an interchange track with the C.P.R. at Moose Jaw, as shown on the said plan; the work to be completed by Dec. 15, 1916. That the Canadian Northern be authorized to cross the Moose Jaw Electric Ry. tracks on Tenth Ave., as shown on the plan; the crossing to be protected by a half-interlocking plant; derails to be placed on the electric railway and home signals on the Canadian Northern Ry.; and that the derails be interlocked with the signals; detail plans to be filed for the approval of an engineer of the Board, within two weeks from the date of this order. That the Canadian Northern be authorized to construct the said transfer track over Main St. and Tenth and Eleventh Aves., and along Home St., Moose Jaw, as shown on the plan; the crossing to be constructed in accordance with the Board's standard regulations affecting highway crossings, as amended May 4, 1910.

Interchange of Traffic at Brantford.

25570. Oct. 27. Re an application of Dominion Steel Products Co., Ltd., for an order directing the Toronto, Hamilton and Buffalo, the Grand Trunk, and the Lake Erie and Northern Railway Companies to afford proper facilities for receiving, forwarding and delivering of traffic belonging to the applicant company, and for exchange of traffic over the said railways; and that the railway companies provide due switching privileges over their respective lines and interchange of switching for the applicant company's purpose and the petition of certain manufacturers and shippers of Brantford pertaining to interswitching between the railways at Brantford, Ont. Upon hearing the application at Brantford, Sept. 28, 1916, the applicant com-

pany, the railway companies, and local manufacturers being represented, and upon the report of the Board's Chief Traffic Officer, the Lake Erie & Northern Ry. consenting: It is ordered that the L. E. & N. R. be authorized to construct an interchange track for receiving, forwarding, and delivering traffic between its railway and the Toronto, Hamilton & Buffalo and Grand Trunk Railways at Brantford, plans showing the proposed interchange tracks to be submitted for the approval of an engineer of the Board; and the cost of constructing the tracks to be borne and paid by the L. E. & N. R. That where the traffic is between Brantford and a shipping point or destination common to the G.T.R. and the L. E. & N. R., or to the Toronto, Hamilton & Buffalo Ry. and the L. E. & N. R., or to both the G.T.R. and the Toronto, Hamilton & Buffalo Ry., and the L. E. & N. R., where interswitching facilities are provided, the company upon whose line, including private sidings tributary thereto, the traffic is loaded, shall be entitled to the line haul and to the privileges of effecting the required delivery on the line of the other company by means of interswitching at destination; provided that the said company can afford facilities and privileges equal to those of the competing carrier at no greater charge.

Halifax & Southwestern Ry. Rates.

25585. Oct. 30. Re complaint of C. A. Bowlby and others, of Port Medway, N.S., alleging excessive freight rates charged by Halifax & Southwestern Ry. from Halifax to Medway station. Upon hearing the complaint at Port Medway, July 5, 1916, the complainants and the railway company being represented, it is ordered that the complaint be dismissed.

Charges for Heated Refrigerator Cars.

General Order 173. Oct. 26. Re (railway) companies tariffs showing charges for use of heated refrigerator cars; and orders 24680 and 24994, dated Jan. 27 and May 22, 1916, respectively, suspending the said tariffs; also order 25251, Aug. 5, 1916, rescinding order 24994 in so far as it affected tariffs for local movements between points west of Lake Superior, subject to the provisions therein contained. Upon hearing the matter at Ottawa, Toronto, Winnipeg, Saskatoon, Edmonton, Calgary, Regina, and Winnipeg on February 8 and 22, June 12, 14 and 15, July 10, 13 and 14, 1916, respectively, in the presence of representatives of the Boards of Trade of Montreal, Toronto, Hamilton, Winnipeg, and Saskatoon, the Calgary Brewing Co., the Canadian Manufacturers' Association, the Ontario Fruit Growers' Association, the Canadian Pacific, Canadian Northern, and Grand Trunk Pacific Railway Companies and the Michigan Central and New York Central Railroad Companies, and upon the report of the Chief Traffic Officer of the Board: It is ordered that order 24680, Jan. 27, 1916, in so far as it affects local movements between points east of and including Westfort, Ont., be rescinded, provided that the clause in the tariffs thereby suspended restricting the number of destinations of less-than-carload shipments be omitted, and that the clause requiring loading in cars in destination order by shippers be revised so as to apply to shipments handled through the carriers' freight warehouse also.

That orders 24680 and 24994, dated Jan. 27 and May 22, 1916, respectively, in so far as they affect through ship-

ments from and to points east of Port Arthur to and from points west of Westfort, be rescinded; provided that the following subdivision of the territory west of Westfort, and the following maximum tolls for heat in addition to the freight rates from or to the territory west of and including Montreal and Lachute, be substituted for those shown in the tariffs, thereby suspended, and that the differences over these maximum tolls do not exceed from or to the territory south and east of Montreal and Lachute the differences expressed in the said suspended tariffs.

Group 1.—West of Westfort to and including Kenora and Rainy River, \$10 a car.

Group 2.—West of group 1 to and including Winnipeg and Emerson, \$11 a car.

Group 3.—Remainder of Manitoba, \$13 a car.

Group 4.—West of group 3 to and including Viceroy, Moose Jaw, Saskatoon, and Prince Albert, \$15 a car.

Group 5.—Province of Saskatchewan west of group 4, \$16 a car.

Group 6.—West of group 5 to and including the C.P.R. Macleod-Calgary-Edmonton line, \$18 a car.

Group 7.—North of Edmonton and west of group 6 to Penticton, Kamloops, and Prince George, \$22 a car.

Group 8.—West of Group 7 to Vancouver and Prince Rupert, \$25 a car.

That general order 152, Nov. 2, 1915, authorizing certain tolls for the use of refrigerator cars for the carriage of vegetables in carloads, be rescinded.

Transfer Tracks at Prince Albert.

25603. Nov. 6. Re application of Grand Trunk Pacific Branch Lines Co., under sections 227 and 237 of the Railway Act, for authority to construct, maintain and operate a connection and transfer track between its Prince Albert Branch and the Canadian Northern Ry. in Prince Albert, Sask., upon the consent of the Canadian Northern Ry., and the report and recommendation of the Board's Chief Engineer, it is ordered that the application be granted.

25604. Nov. 6. Re application of Grand Trunk Pacific Branch Lines Co., under section 237 of the Railway Act, for authority to construct its Prince Albert Branch and the connection and transfer track between that branch and the Canadian Northern Ry., across Sixth Ave. East, in Prince Albert, Sask. Upon the report and recommendation of the Board's Chief Engineer, no objection having been offered by the City of Prince Albert to the granting of the application, it is ordered that the applicant company be authorized, at its own expense, to construct and maintain its Prince Albert Branch and connection and transfer track between that branch and the Canadian Northern Ry., across Sixth Ave. East, Prince Albert, as shown on said plan and profile on file with the Board, and in accordance with the Board's Standard Regulations Affecting Highway Crossings, as amended May 4, 1910.

Interchange Track at Aurora.

25615. Nov. 3. Joint order by Board of Railway Commissioners and Ontario Railway and Municipal Board. Re application of Town of Aurora, Ont., under subsec. 3 of sec. 228 of the Railway Act, for an order requiring that the lines and tracks of the Grand Trunk and the Toronto & York Radial Railways be connected so as to admit of the transfer of locomotives and trains from the lines or tracks of one such railway to those of another and the receiving, forwarding, delivering and interswitching of traffic between such railways. Upon hearing the application at Toronto, Oct. 6, in the presence of counsel for and representa-

tives of the applicant, the Grand Trunk and the Toronto & York Radial Railways, the Canadian Manufacturers' Association, the City of Toronto and Thos. Urquhart appearing in person, and upon the reports of the Chief Engineer and the Chief Operating Officer of the Dominion and an engineer of the Ontario Railway and Municipal Board, it is ordered that the applicant be authorized, at its own expense, to construct an interchange track between the Grand Trunk and the Toronto & York Radial Railways at Aurora, in the Grand Trunk yards, with a connecting track as shown on the line marked "Estimate no. 1," on the plan filed by the applicant.

Dominion Express Co.'s Fish Tariff.

25616. Re Supplement 3 to Dominion Express Co.'s Special Fresh and Frozen Fish Tariff, C.R.C. 4434, and the applications of Armstrong Trading Co., of Portage la Prairie, Man.; Canadian Fisheries Association, of Montreal, and W. J. Guest Fish Co., of Winnipeg, for an order disallowing the said tariff. Upon reading what is filed in support of the applications, and the reports of the Board's Chief Traffic Officer, and upon its appearing that the cancellation of the rates on fresh and frozen fish provided for in the said supplement was unlawful to the extent that the supplement was not published and filed at Selkirk, Man., 30 days previously to the date on which it was intended to take effect, as required by sec. 328 of the Railway Act, as amended, it is ordered that the said notice of cancellation be disallowed.

Esquimalt & Nanaimo Railway Tariffs.

25641. Nov. 16. Re application of Esquimalt & Nanaimo Ry., under sec. 11 of the Acts 7-8 Edward VII., chap. 61, for the approval of a bylaw, passed Oct. 11, 1916, authorizing C. E. E. Ussher, Passenger Traffic Manager, and C. E. McPherson, Assistant Passenger Traffic Manager, to prepare and issue tariffs of tolls to be charged for the carriage of passenger traffic upon the railways owned or operated by the company, or any portion thereof. It is ordered that the said bylaw be approved; and that order 5856, Dec. 15, 1908, approving of the bylaw passed Dec. 4, 1908, appointing L. D. Chetham, District Passenger Agent of the company, and authorizing him to prepare and issue tariffs of the tolls to be charged, be rescinded.

Algoma Central & Hudson Bay Ry. Pulpwood Rates.

25644. Nov. 17. Re complaint of Lake Superior Paper Co., of Sault Ste. Marie, Ont., against the alleged excessive and unreasonable freight rates charged by Algoma Central & Hudson Bay Ry. on pulpwood, in carloads, for distances of 17 5 to 300 miles, as published in C.R.C. no. 343 and C.R.C. no. 345, it is ordered that the complaint be dismissed.

Chatham, Wallaceburg & Lake Erie Railway Passenger Rates.

25653. The application of Major G. T. McKeough for an order directing the Chatham, Wallaceburg & Lake Erie Ry. to put in force, between Chatham and Cedar Springs station, Ont., a passenger rate applicable to persons carrying on their business or practising their professions in Chatham, but residing in those portions of the Townships of Raleigh and Harwich served by the railway (the said rate to be available also for members of such person's families), which said rate shall not exceed 25c for one round trip ticket when such tickets are purchased in book form as commutation tickets, it is ordered that the application be dismissed.

Joint Class Freight Tariffs.

25656. Nov. 23. Re proposed withdrawal by railway companies, on Nov. 30, of joint class freight tariffs in Eastern Canada which have not already been lawfully superseded by new joint tariffs upon the same description of traffic between the same points. Upon hearing the matter at Ottawa, Nov. 21, 1916, and upon its appearing that the proposed withdrawal of joint class freight tariffs without the substitution of other joint class freight tariffs is in contravention of sec. 338 of the Railway Act, it is ordered that the Grand Trunk, the Canadian Pacific, and the Canadian Northern Railways, file with the board not later than Nov. 27, to become effective Dec. 1, 1916, supplements to the joint class freight tariffs now in effect, and which are not being superseded by new joint tariffs already published and filed, providing rates which shall not exceed those at present in effect by more than 2c per 100 lbs. in the 1st class, the remaining classes of the Canadian Freight Classification to be proportioned to the 1st class rates so increased in accordance with the Standard Maximum Mileage tariff approved by the board for the use of the said companies.

The judgments, etc., in this matter are given fully on another page under "Cancellation of Joint Tariffs Forbidden by Board of Railway Commissioners."

Telegraph, Telephone and Cable Matters.

Lloyd Cadle has been appointed assistant manager, Winnipeg office, Great North Western Telegraph Co., and W. A. Whyte has been appointed manager of the office at Brandon, Man.

A meeting of C.P.R. telegraph agents and managers in British Columbia was held at Vancouver, Nov. 13 and 14, for exchange of ideas and discussion as to the further efficiency of the telegraph service, R. N. Young, Superintendent of Telegraphs, British Columbia District, was chairman.

W. T. Robinson, agent, C.P.R. Telegraphs, Ottawa, Ont., died there of hemorrhage, Oct. 30, aged 56. He was born at Cornwall, Ont., and served with the Great North Western Telegraph Co. at Montreal, and the Western Union Telegraph Co. at Chicago, Ill., prior to 1886, when he entered C.P.R. Telegraphs service at Montreal, and was transferred to Ottawa in 1902.

The Great North Western Telegraph Co. has opened offices at Chandler, Margo, Ridpath and Sturgis, Sask., and Alliance, Alta., and has closed its offices at Valcarter Camp, Que.; Barriefield Camp, Bobcaygeon, Camp Borden, Clifton House, Niagara Falls, Coldwater, Helderleigh, Holland Landing, Kemptville, Paisley, Port Sandfield, Tobermory and Warkworth, Ont. The name of the office at Sellwood Jct., Ont., has been changed to Milnet.

Among the Express Companies.

K. Copeman has been appointed route agent, Dominion Ex. Co., Campbellton, N.B.

P. H. Findlay has been appointed cashier, Dominion Ex. Co., North Bay, Ont., vice R. Glover, promoted.

S. G. Easton has been appointed agent, Dominion Ex. Co., Red Deer, Alta., vice H. W. Kinzett, transferred.

The Canadian Northern Ex. Co. has opened offices at Carmel, Chandler, For-

gan, Hardy, Margo, Ridpath and Sturgis, Sask.

James McLay, heretofore agent, Dominion Ex. Co., Portage la Prairie, Man., has been appointed agent at Swift Current, Sask.

C. E. Ford, heretofore route agent, Dominion Ex. Co., has been appointed agent at Edmonton, Alta., vice A. W. Johnston, resigned.

R. Glover, heretofore cashier, Dominion Ex. Co., North Bay, Ont., has been appointed agent at Orangeville, Ont., vice A. Shain, resigned.

The Dominion Ex. Co. has opened offices at Port Dover, Ont.; Fleet, Alta., and West Summerland, B.C., and has closed its offices at Oxford Lake and Blue Sea, Que., and Poplar and Tappen, B.C.

The Board of Railway Commissioners has disallowed the Dominion Ex. Co.'s notice of cancellation of rates on fresh and frozen fish covered by supplement 3 to its tariff C.R.C. 4434, on complaints from fish shippers in Montreal, Winnipeg and Portage la Prairie.

It is announced from Edmonton, Alta., that the Alberta Government is taking a friendly action against the Dominion Ex. Co. to settle the question as to the amount of intoxicating liquor which an express company may handle under the recently enacted prohibitory laws. The Provincial act provides that one quart of spirits and two gallons of malt liquor may be imported for private use, and if more than this is found on any premises it is to be taken as prima facie evidence that it is being held for illegal use. It is claimed that express companies have no option in the matter, but that they must accept goods as offered for transportation, and the Government holds that the act which limits the quantity for private use, also limits the carrying rights of express companies. The action is being taken on a specific case against the Dominion Ex. Co. for delivering to a private citizen in Calgary a quantity of liquor in excess of the legal one quart of spirits and two gallons of malt liquor.

The St. Paul, Minn. Union Station buildings were condemned by the State Fire Marshal recently and ordered to be removed within six months. The order was issued on the ground that the buildings are dangerous to human life and surrounding property. Plans for the construction of a new station by the St. Paul Union Depot Co. have not yet been agreed to by all the roads concerned. The plans for a new station first prepared have been objected to by the President of the Chicago Great Western Rd. on the ground that the plan of operation of the track system would be prohibitively expensive.

Greater Winnipeg Water District Land Settlement.—In connection with the construction of the new water supply aqueduct for Winnipeg a railway was built from St. Boniface to Waugh, on the Shoal Lake inlet of Rainy Lake. The commissioners in charge, desiring to promote settlement along the line, an arrangement has been made with the Manitoba Government, under which three and a half townships have been acquired from the Dominion Government in the Birch River district, 72 miles from Winnipeg, and are being opened for immediate settlement. A land settlement office has been opened under the charge of E. W. Kopecki, and the government departments will co-operate in the work.

Electric Railway Department

Passenger Cars for London and Port Stanley Railway.

Some preliminary details of the three motor passenger cars which are being added to the London & Port Stanley Ry. equipment were given in Canadian Railway and Marine World for November. These cars will be, in most respects, duplicates of those already in service on the line, but in addition to being longer, there will be embodied a number of improvements, all making for increased convenience and efficiency. Following are the general dimensions of the car bodies:—

Length over all	71 ft. 7 ins.
Length over end vestibules	69 ft.
Length over end of car body	57 ft. 3 ins.
Width over all	9 ft. 10 ins.
Width over sheathing	9 ft. 6 ins.
Width over platform floor including trapdoors	9 ft. 6 ins.
Height from rail to top of roof (car light)	13 ft. 6 1/4 ins.
Height from under side of sills to top of roof	9 ft. 10 1/4 ins.
Height from top of rail to top of platform (car light)	4 ft. 3 1/4 ins.
Seating capacity of passengers	72

The weight of the car body, including heat equipment, seats, light foundations, brake, draft gear, including supports, ready for the installation of control equipment and air brakes, will be about 49,733 lb.; control equipment, 9,500 lb.; air brake equipment, 2,220 lb.; 4 motors complete, 16,000 lb.; 2 trucks, 7 ft. wheel base with 36 in. steel wheels and 6 in. axle with 5 x 9 in. journals, 25,006 lb., making the total approximate weight of the car complete, 102,459 lb.

The equipment, which will be supplied to the car builders by the Hydro Electric Power Commission of Ontario, which is handling the matter for the London Railway Commission, will, for each car, consist of:—4 G.E. 225B 1,500 volt motors, 1 type E, G.E. 1,500 volt control apparatus, 1 c.p. 29A. G.E. air compressor, including complete straight and automatic air equipment, double end, not including pipes and fittings; 2 G.E. pantographs complete, with main fuse in top of roof and insulation, not including brackets and suspensions; 2 headlights, 1 set of complete cables for motors and control, but not air equipment; 1 set of 1,500 volt electric heaters, but not including conduit cables and brackets; 2 trucks complete with wheels, axles and brake beams, to connect up with brake rod under car body furnished by the builders; 1 air signal system, not including piping; 36 seats, 24 finished in plush and 12 in fabrikoid; 1 complete storage battery.

The entire bottom frame of the car is to be made of structural steel shapes and plates, centre and side sills to be continuous, floor and side frames to include cross beams designed to transfer floor load to the side trusses. The floor framing will be braced diagonally between the cross beams, and the end and vestibule framing will have special provision against the effects of a collision. The corner and side posts will be of channel construction, and intermediate posts of T iron, side sheathing, including roof, of steel plate, braced and fastened to the bottom sills and side plates by rivets. The inside of the car will be of solid quarter sawed Mexican mahogany inlaid finish. The flooring of the main body and vestibule will be of yellow pine 3/4 by 3 1/4 in. double flooring for the whole car, and between each floor there will be two layers of waterproof felt paper. The lavatories will have rub-

ber tiling on the floors, white with blue lines, smooth finish. The platform will be on the same level as the car floor, and enclosed with stationary round vestibules sheathed outside with 1-16 in. sheet steel, and inside with wooden panels of ash. Each vestibule will have two drop windows and swinging end door with 26 in. opening, and two side swinging doors each with 29 in. opening. The step opening will be enclosed with single swing doors arranged to swing against the end of the car body, and the openings between the edge of the platform and vestibule doors will be fitted with trapdoors of metal with extension threshold. Triple steps of the steam railway car pattern, made of steel, fitted with anti-slip metal treads and brass finishing strips, after the Pullman design, will be supplied. The vestibule doors will be of mahogany, panelled in the lower portion and glazed in the upper. The roof will be of steel plate 1-16 in. thick, rivetted to the carlines, all joints to be welded or soldered to make a tight joint, and the whole roof will be smooth finish. Twenty automatic ventilators will be built in the roof, 10 on each side. Window fixtures will be finished in bronze, and each sash equipped with rubber weather strip all round, window frames of mahogany with 1/4 in. plate glass laid in rubber; the upper oval windows and the lavatory windows will be of opalescent cathedral glass, the latter being after the Pullman design. The cars will be provided at each end with one spring buffer complete, and with two air sanders. A steam locomotive pilot will be provided at each end of the cars, so arranged as not to interfere with the radial draft rigging. Each car will be equipped with two lavatories, complete with all up to date fittings.

In deciding on the specification details of these cars, the desire was to obtain as light a car as possible, consistent with absolute safety. The original approximate weight for the cars was 104,729 lb., but careful calculation and refinement of design, enabled the engineers to adjust the specifications and reduce the weight to 102,459 lb. The body weight of the car per foot length works out at 710.47, and the body and equipment weight per foot length is 1,463.7 lb. The average weight per car foot length for steam railway cars of similar length, complete with trucks, etc., is somewhere about 1,300 to 1,500 lb. The total dead load carried on the two side plates is 61,720 lb., and the live load 15,000, making a total of 76,720 lb. This load is divided as follows—on the centre span 55,000 lb., carried on the overhang 21,720 lb. The load carried on each beam at each end is 5,430 lb., the total load on each beam being 38,360 lb. The web is being stiffened against buckling, by the application of stiffeners at the ends and inner edges of bearing plates at all points of concentrated loads, and also at intermediate points, and not farther apart than the depth of the full web plate, with a minimum limit of 5 ft., the actual minimum distance between stiffeners being 2 ft. 10 in., and depth of web 3 ft. 0 1/2 in. The specifications adopted give maximum capacity of 3,671 moment of inertia, an excess on safe side of 1,509; 12,500 vertical shear, an excess of 11,100; stiffeners every 2 ft. 10 in.,

2 3/4 in. closer than required, and 0.00278 of span deflections, an excess over maximum demand of 0.00108 of span.

In construction generally, the details are the same as for the cars now in operation, all of which were fully described and illustrated in Canadian Railway and Marine World for Jan. 1915. The chief difference between those cars and the ones herein described, is in length, where an additional 10 ft. 7 in. is obtained. Among the improvements are, larger and more convenient lavatories, large water cooler with sanitary drinking cups, rubber tiling for flooring of lavatories, rubber matting over trapdoors, heavier fittings generally throughout the car, sliding doors leading from platform to main car body, spring buffers at each end of car, steps at both ends, larger doors of the sliding type over steps leading into the baggage compartment, two collapsible seats in the baggage compartment and trainman's locker, in addition to a few slight changes in design tending toward lower maintenance cost and general efficiency.

An order has been placed with the Jewett Car Co., Newark, Ohio, for two cars according to this specification, and the electrical equipment, which is practically the same as that supplied for the cars now in operation, has been ordered from the Canadian General Electric Co. Delivery of the cars is to be made by June 1.

The Ontario West Shore Railway Difficulty.

An engineer representing the Hydro Electric Power Commission of Ontario was reported, on Nov. 16, to be going over the old Ontario West Shore Ry. route from Goderich toward Kincardine, Ont. This is the railway partially built by a company, the controlling power in which was exercised by J. W. Moyes, Toronto, upon the proceeds of bonds guaranteed by the municipalities through which the line was to run. The municipalities are paying up on the bonds and have the uncompleted line as an asset. The object of the present survey is to ascertain the cost of completing the line and putting it in order for operation.

It is reported that the C.P.R. is interested in getting the line in operation and is prepared to offer a free right of way over the Maitland River bridge in return for freight shed privileges uptown. From the south bank of the Maitland River the route into Goderich would be along the river bank to the north end of Cambric Road.

Handling "Near Accidents."—In Buffalo, N.Y., conductors and motormen report license numbers of automobiles whose drivers are reckless, or who are responsible for "near accidents." The International Ry. safety committee communicates with the owner of such automobile, and if a second report is received against the same driver, the matter is taken up with the police department. It is expected that results mutually beneficial to both the railway company and auto owners will follow.

Three Rivers Traction Co's Lines and Equipment.

In the article under the above heading in Canadian Railway and Marine World for November there were three unfortunate errors. It was stated that with the opening of the Cap de la Madeleine extension the company would have in operation 42 miles of track. The omission of a decimal point between the 4 and 2, in the information supplied us, was responsible for the error. We have since been officially advised that the company's track mileages, incorporating extensions made from time to time since the original line was opened, are as follows: City belt line, 2.80 miles; Cap de la Madeleine subdivision, 3.85 miles; Wayagamack branch, 0.36 mile; total track mileage, 7.01. The Cap de la Madeleine subdivision and the Wayagamack branch, which starts from it, together make 4.21 miles.

The Cap de la Madeleine extension was spoken of as terminating near the Union Bay Co.'s large new paper and pulp plant. The Union Bag Co. is the owner of the plant referred to.

The additions to the company's rolling stock were spoken of as "rear-side" cars, instead of near-side.

London and Port Stanley Railway Operating Results.

A report prepared under the direction of the London, Ont., City Auditor gives the following figures for the first year of the L. & P. S. Ry's operation as an electric line by the London Railway Commission:—

Passenger earnings	\$112,173.49
Freight earnings	150,920.81
Miscellaneous earnings	11,964.02
Total gross earnings	\$281,058.32
Operating expenses	180,619.88
Net earnings	\$100,438.44
Taxes	\$ 6,962.64
Interest	40,786.29
Rental to city	20,000.00
Sinking fund	8,775.79

76,524.72

\$23,913.72

The commissioners donated \$1,300 to the British Red Cross Society and paid off \$4,139.58 sinking fund charges which accrued during the reconstruction of the line.

Safety First Prize Sentences.

In order to interest the Victoria school children in the safety first campaign, the British Columbia Electric Ry. offered prizes for the best sentence of 11 words arranged as an acrostic of safety first. Two prizes were offered, but owing to the number of competitors, the company added five more. The awards were made for the following sentences:—

"Street accidents follow every thoughtless youngster foolishly impeding street trams."

"Sense and foresight ensure the young from injury, reducing street tragedies."

"Strict attention, for every time you forget, it represents sudden tragedy."

"Sound advice. Fathers educate the young fellows in respecting street traffic."

"Safety always first explains that your force invariably remembers schoolboy thoughtlessness."

"Serious accidents frequently ensue through young folks ignoring rules stipulated therein."

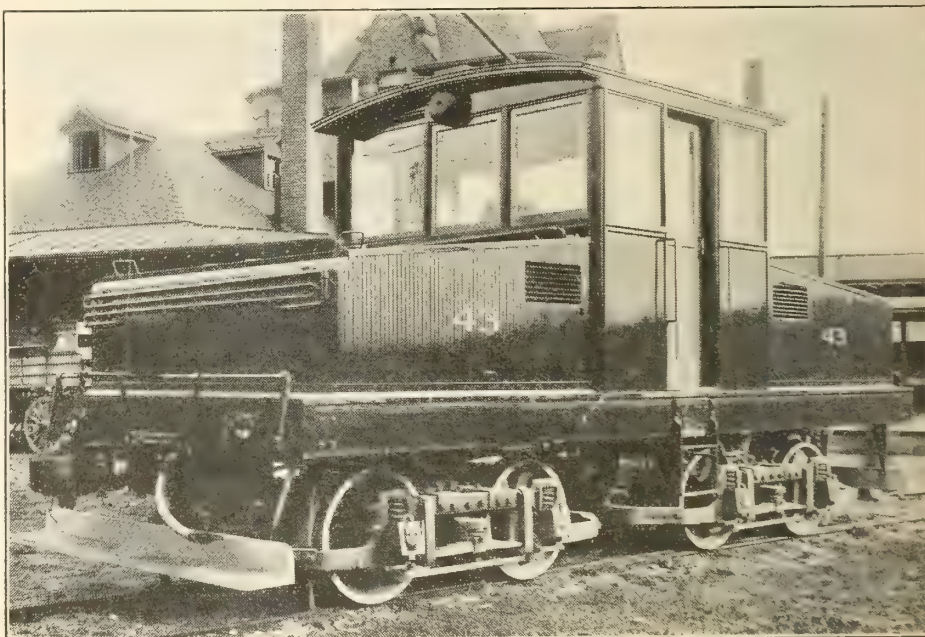
"Steer aisy, Flanigan! Else 'tis yer funeral I'm reporting sometime tomorrow."

Electric Locomotive for Oshawa Railway.

The Oshawa Ry., Oshawa, Ont., has added to its rolling stock a 25 ton switching locomotive, which is illustrated herewith. Its principal dimensions are:—

Length of body	23 ft.
Length over all, about	27 ft.
Truck centres	12 ft.
Wheel base of trucks	4½ ft.
Width over all	9 ft.
Length of cab	7 ft.

The underframe is built entirely of steel; the sills are 10 in. channels at 20 lb., with heavy angle diagonal braces rivetted to large gusset plates; the underframe is filled with concrete mixed with steel punchings, instead of stone, in which is imbedded old "T" rails, to give additional strength and traction weight. The cab is built of wood, as are also the



Oshawa Railway's Electric Locomotive.

sloping housings at the ends, which house the air compressor reservoirs at one end, and the rheostats at the other end.

The locomotive is equipped with a Westinghouse 101-B-2 quadruple motor equipment, with one L-4 controller arranged in either direction without the motorman changing his position. The air brake equipment consists of a Westinghouse No. 6-E-T double end equipment, with one independent and one automatic brake valve, placed near the controller, and all the small parts, such as governor, distributing valve, feed valve, reducing valve and equalizing reservoir placed in the cab, with all piping open and easy to get at. The two gauges are mounted on an iron bracket, which is bolted to the iron brake valve stand, which brings the gauges over the brake valves. The locomotive is mounted on 76-E trucks with 33 in. cast iron wheels; it is also equipped with Ohio Brass air sanders, poling sockets, also a special M-C-B coupler at each end, and one rotary gong mounted on one end of the cab. It was built by Ottawa Car Manufacturing Co., Ottawa, Ont.

The Three Rivers Traction Co. has received 2 single end and 1 double end single truck, one man p.a.y.e. cars from Ottawa Car Manufacturing Co.

The Hull Electric Co. will give a 15 minute service on the new loop line to be built in Hull, Que., immediately.

An Alien's Right to Sue as Tutor Questioned in Quebec.

The Court of Appeal, sitting in Montreal in October, heard the Montreal Tramway Co.'s appeal against a verdict in the Superior Court awarding \$2,000 to Peter McAllister as tutor of Francis McAllister, injured in a tramway accident. The latter was a student at Loyola College, and the accident occurred in front of the M.A.A.A. grounds at Westmount. Counsel for the company contended that the victim of the accident was born in Ithaca, N.Y., and still resided there at the time of the accident; that his tutor and father also was a United States subject, residing in Ithaca. The victim was a minor, under the Quebec law, being less than 21 years of age. Under the Quebec law, minors cannot sue before the courts

to recover damages resulting from personal injuries, and their proceedings must be entered in the name of a tutor appointed to them for that purpose. An alien, as in the present case, a United States subject, cannot be appointed a tutor under the Quebec laws, as this is considered a public function to which only British subjects can be appointed. The father of Francis McAllister having been appointed a tutor by a Quebec court, his appointment was totally illegal and could not be considered as having given him any status before the Quebec courts.

The respondent, through counsel, answered this by stating that the personal legal status of the victim of the accident was ruled by New York State laws, and even if the father of the victim had been illegally appointed tutor by a Quebec court, he had been appointed guardian and guardian ad litem by a New York court, and the Quebec Civil Code, acknowledged, at least, the latter status by article 6. Judgment was reserved.

The Montreal Board of Control, on Nov. 16, decided to consult with the city engineers upon the desirability of granting the Canadian Northern Ry.'s application for the stopping of street car traffic on Dorchester St. while a bridge is being built and the work done in connection with the building of the C.N.R. terminal station.

Sandwich, Windsor & Amherstburg Railway Employees Wages.

Canadian Railway and Marine World for November contained particulars of demands made by Sandwich, Windsor & Amherstburg Ry. employees, which were submitted to a board of investigation and conciliation under the Industrial Disputes Act, its members being the county judge of Essex as chairman, E. G. Henderson, of the Windsor Salt Co., representing the railway, and Magnus Sinclair, of Toronto, representing the men. As the result of the board's work, a new agreement was entered into between the company and the men, to be in force from Oct. 1, 1916, to Apr. 1, 1918. The following table shows the hourly wages paid up to Sept. 30, the wages asked by the men, and the wages agreed on by the arbitrators:

	Old.	Asked.	New.
First 6 months	25c	27 1/2c	28c
Second 6 months	26c	32 1/2c	29c
Second year	27c	35c	31c
After second year	28c	35c	32c

An additional allowance of 1c an hour, exclusive of overtime, is to be paid to all conductors and motormen in lieu of uniforms. Caps and badges will be supplied free by the company, and all men must be in suitable uniform, clean and tidy when on duty. The day's work for all conductors and motormen is from 9 to 10 hours, to be completed within 12 consecutive hours as far as possible. The runs are to be as nearly equally divided as possible between two crews, to be known as early and late runs, and when practical the present schedule shall be arranged to provide for this. Conductors and motormen will not be required to perform extra work in excess of the regular schedule of 10 hours work, except in cases of necessity, and for such extra work shall receive 4c an hour extra. Conductors and motormen training students shall be allowed 25c a day therefor while so engaged. Spare men must be at the barn for work at 5.45 a.m. and at 4 p.m. Those who fail to procure work shall be allowed one hour for such attendance, either morning or afternoon.

The other principal points in the agreement are summarized as follows: Should any difficulty arise out of the agreement or should any other matter arise which is not provided for in the agreement, the company's officers shall at all reasonable times here such representatives as the employees may nominate from their own number, regardless of the fact that they may be members of a committee or members of a division of the Amalgamated Association of Street Railway Employees of America. The company will not discriminate against any employee for being a member of the Amalgamated Association of Street & Electric Railway Employees of America, and any employees who are members of any committee of the employees, or are officers of any association of employees, or delegates to conventions of street railway men, shall be entitled to leave of absence to do committee work or attend conventions without losing any privilege. Any employee against whom charges may be received will be required to report when off duty to the Superintendent. His case will be considered by the proper officers and dealt with according to the company's rules, but any employee against whom a charge is made shall have the right to appeal to the General Manager or President, and may take with him any committee or delegation of his fellow employees and if upon investigation it is proved that there was not sufficient cause for his suspension or dis-

missal he shall be reinstated in his former position and paid at schedule rate for all time lost. All cars are to be cleaned, oiled, and equipped, and fires laid by barn men at Windsor barns prior to car men taking out cars for their runs. All cars are to be properly equipped with good brakes, fenders and modern sanders, as required by the Ontario Railway Act.

Magnus Sinclair, the men's representative, in signing the unanimous report of the board endorsing the agreement as entered into, reserved the right to make an additional report as to the question of recognition of the American Association of Street and Electric Railway Employees of America. In a lengthy report he said that on receipt of the men's demands as printed in Canadian Railway and Marine World for November, James Anderson, General Manager, stated that while the company would not recognize any organization of the employees, it had no objection to their belonging to any organization and that it would not discriminate against them therefor, but that it would not enter into an agreement that would compel the employees to join any union. He charged that two employees, L. Salive and F. Fields, had been dismissed by Mr. Anderson because they circulated a petition among their fellow employees asking for an increase in wages, but added that they were reinstated. Mr. Sinclair also contended that the Detroit United Ry., which owns and controls the Sandwich, Windsor & Amherstburg Ry., has agreements with the other four groups of its employees which are made with the local unions, and he protested that the Sandwich, Windsor & Amherstburg Ry. employees were being discriminated against.

The British Columbia Electric Railway and the Jitney Business.

The Vancouver City Council's application to the British Columbia Electric Ry. recently for a reduction in rates for domestic electric lighting in the city brought out some discussion on the jitney situation. The chairman of the special committee which had interviewed the company's management on the matter reported that the officials said it was impossible to give a lesser rate for power used for domestic lighting purposes as the company's annual interest on the bonded indebtedness, amounting to \$960,000, was compared with \$850,000 gross revenue received from June, 1915, to June, 1916, which showed a net loss of \$110,000. This General Manager Kidd assured them would be still further increased in the coming year in all likelihood, because the company's new agreement with its employees called for additional wages amounting to \$120,000.

Alderman Gale, supplementing the report, said the company's officers practically refused to reduce the rates unless the council would enact legislation regulating the jitney traffic along lines similar to that regulating corporations. The company was undoubtedly losing money every day in consequence of the jitney traffic.

Alderman Woodside said there was another aspect to the jitney traffic and that was the question of street maintenance. Jitneys were rapidly destroying the pavements especially at crossings.

Alderman Mahon said the jitney traffic was being operated at a loss of revenue to the city. The B.C.E. Ry. paid a percentage of its revenue to the city and, according to his calculations, if it had not been for the jitney traffic the percentage

receivable by the city would have increased from the 5% for 1915 to 6% in 1916. The loss of this 1% was a serious matter for the city.

As a result of the discussion a special committee, consisting of Aldermen Mahon, Gale, Kirk and McIntosh, was appointed to procure exhaustive data in respect to the jitney traffic, what benefits the city was actually deriving therefrom and any other matter which the investigation might bring forth. The subject matter of the report will be brought before the city council upon a motion, notice of which was given, to amend the jitney bylaw. The special committee met the jitney men, Nov. 9, to discuss the matter, officials of the B.C.E. Ry. being asked to be present.

The company's attitude on the jitney situation is expressed in a letter from G. Kidd, General manager, read to the city council recently, in connection with the second tracking of Hastings St. East. He said: "I regret to inform you that the attitude adopted by the municipal authorities in refusing to adequately control the jitney traffic in the same way as my company is controlled under acts passed by the Provincial Legislature and under its various agreements with the city and surrounding municipalities, has prejudiced our credit to such an extent that it is now altogether impossible for us to consider any question involving further expenditure on our street railway system.

"The attitude of my company in this connection is the same as that adopted by all street railway companies on the continent, and is fully recognized by public service commissions and other authorities which have inquired into the jitney traffic. In support of this statement I enclose a print of the decision of the Up-State Public Service Commissions of New York, which prohibited jitneys from operating along substantially the same routes as street cars in Rochester. The following extracts from the decision would apply in Vancouver as well as in Rochester:

"We are of opinion that the electric railway must for many years be regarded as the backbone of any dependable transportation system in such a city. To arrest the development of its electric railway would be to injure greatly the city's growth and future prospects. In our opinion no dependable form of transportation, good alike in winter and summer, has yet been devised to take the place of what this city would lose if further development of its electric railway was to be discouraged and interfered with by the state. Protection is being extended it (street railway system), now because we feel that on the whole the existing street railway system of this city, viewed not as a mere money-making machine, operated for the benefit of its stockholders, but as a public agency, is distinctly worth saving in the interests of the people."

"In other words, the commission referred to realizes that the public cannot have an adequate street car service and unregulated jitneys existing side by side. The public must choose which service they prefer and if they decide to favor the jitneys by releasing them from obligations which they impose on the tramway company, then they must sooner or later realize that all development work by the tramway company must cease."

The Hull, Que., city council, on Nov. 9, authorized the remission of the second business tax of \$1,000 imposed for the first time this year, on the Hull Electric Co.

Electric Railway Projects, Construction, Betterments, Etc.

Brantford and Hamilton Ry.—We are officially advised that the extension from Market St., the present terminus of the company's line in Brantford, to the Lake Erie & Northern Ry station is 1,500 ft. This extension is now being built upon the company's own right of way. E. P. Coleman, Hamilton, Ont., is General Manager. (Nov., pg. 460.)

Brantford Municipal Ry.—We are officially advised that the extension of the track on Morrall St., in the Holmedale district, Brantford, Ont., for 1,100 ft. is in progress. (Oct., pg. 425.)

British Columbia Electric Ry.—A letter from the company was read at a meeting of the Vancouver City Council, Oct. 24, declining to comply with the council's request of Oct. 7, to construct a second track on Hastings St. East, from Renfrew St. to the city boundary. Notwithstanding this the council's Railway and Bridges Committee decided, Nov. 2, to ask the city council to renew the request.

A good deal of track repair work has been done during the autumn on the Fraser Valley line. Road crossings have been repaired, and on long stretches of the track new ties have been put in and additional quantities of ballast spread. (Nov., pg. 460.)

Calgary Municipal Ry.—We are officially advised that half a mile of single track is being built to connect with the north section of the city over the new Centre St. bridge. The opening of this route will save a mile ride between the two outside sections of the city as compared with the present route via West Calgary. For this purpose the city has purchased 30 tons of 80 lb. rails from the City of Lethbridge. T. H. McCauley is General Superintendent, Calgary, Alta. (Oct., pg. 425.)

Edmonton Radial Ry. We are officially advised that there is no truth in a recent press report that the city council was about to expend \$75,000 upon extensions. All the extension work contemplated is an 1,800 ft. piece of track to Elm Park, the estimated cost being \$2,500, and for which most of the material is in stock. A. G. Harrison is City Commissioner. (Nov., pg. 460.)

Hull Electric Co.—We are officially advised that the improvements, second track work and extensions which it is proposed to carry out in Hull, Que., are as follows: A second track on Montcalm St. and Chelsea Road; a loop on Chelsea Road, Mountain Road, Second Ave. and Montcalm Ave. The length of second track to be laid is 8,660 ft., and of loop line, 4,800 ft. The city council, on May 9, authorized the signing of the contract covering these alterations. G. Gordon Gale is General Manager. (Oct., pg. 425.)

Halifax Electric Tramway Co.—In an address before the Halifax Commercial Club recently, H. R. Mallison, of Montreal, Secretary to the President, H.E.T. Co., stated that exclusive of the proposed hydro electric power development at Gaspereaux, N.S., the company was spending \$1,500,000 upon the improvement of the gas, electricity and tramway plants in the city. The steam plant for the production of electric power was being doubled, so that when the hydro electric power plant was in operation there would be ample reserve to prevent any interruption of Gaspereaux plant.

The company's tramway lines had been spread out in various parts of the city

wherever business was available and in some cases lines had been built over territory which, under ordinary circumstances, would be considered unprofitable. Certain improvements in the service had been inaugurated during the past year and others were in contemplation. The general conditions of service might be materially improved. Owing to changed conditions in the city the lines as originally laid out do not prove to be the most convenient and direct routes for serving the population. The conditions in the city were still changing, largely owing to the construction of the new ocean terminals for the Intercolonial Ry. As a preliminary step towards the general rearrangement of the lines application had been made to the city council for permission to remove the present single track curves on Hollis, George Granville and Buckingham Sts. This would cost a considerable amount, but was necessary in the general interests of the public. Other work in this direction was in contemplation, but as the plans had not yet been approved by the directors, he was not in a position to say anything about them. (April, pg. 156.)

Montreal Tramways Co.—The discussion of the proposed new franchise for the company is still being carried on by the Board of Control. Questions dealing with the service, such as the frequency and speed of cars on the several lines; the fares and conditions connected therewith; the number of passengers to be carried per car, and of extensions of lines have been discussed and certain preliminary understandings reached. The question of the extension of lines was under discussion Nov. 9. The board decided in favor of the following extensions which were among those recommended by G. R. MacLeod, the city's engineer in charge of railway matters:—Atwater Ave., across the G.T.R. tracks and the Lachine Canal to Centre St.; Charlevoix St., from Centre St. to Wellington St.; from Van Horne Ave. via Park Ave., Beaumont and Brenner Sts. to Abraham Ave.; Davidson St., from Ontario St. to Notre Dame St.; Dickson St., from Notre Dame St. to Boyce St. The company objected to the first named extension on the ground of its having to be constructed across four G.T.R. tracks, and it was suggested that the Board of Railway Commissioners would order the necessary safety devices to be installed or that an arrangement might be made to carry the street railway tracks across the steam railway by a bridge. The widening of Dickson St. to 66 ft. was suggested, the company to give the land through one of its controlled concerns which owns it. Other extensions were discussed but no decision reached in regard to them. It was resolved that the city and other public bodies should unite in approaching the Dominion Government to secure aid towards the construction of certain tunnels necessary in connection with the extension plans, which are estimated to cost \$2,300,000. These are to be located at Wellington St., estimated to cost \$1,300,000, and at Charlevoix on Atwater Ave., estimated cost, \$1,000,000. (Nov., pg. 460.)

It is reported that the company will erect an overhead bridge on Fortification Lane, Montreal. (Nov., pg. 464.)

Oshawa Ry.—We are officially advised that the contract for building the new heating chamber at the company's plant, Oshawa, Ont., has been let to R. Wallace

for \$1,400, and that the contract for the heating plant has been let to G. T. Lander, Oshawa, for \$1,600. H. W. Cooper is Manager, Gananoque, Ont.

Ottawa Electric Ry.—Petitions are being extensively signed asking the municipalities interested to arrange with the company to extend its line to Notre Dame Cemetery. The matter came before the Eastview Town Council some time ago, when the company informed that body it would not extend the line until it had an extension of its franchise.

Port Arthur Civic Ry.—We are officially advised that it is contemplated to resurface the tracks on Cumberland St., from McVicar St. to Arthur St., and to replace the present rail joints with 100 lb. joints. M. M. Inglis is Manager, Port Arthur, Ont. (Aug., pg. 338.)

Saskatoon Municipal Ry.—The new bridge at Twenty-fifth St., Saskatoon, built by the Saskatchewan Government, the city paying one-third of the cost, was opened for traffic Oct. 31. A double track for electric railway operation is laid over the bridge, but it is not intended to put up the overhead wires for the running of cars until the spring.

Sudbury-Copper Cliff Suburban Electric Ry.—The Board of Railway Commissioners had before it at Ottawa, Nov. 7, the company's application for an order apportioning the cost of straightening the Nelson St. bridge, Sudbury, Ont., and authorizing the company to operate its electric railway over it. (Oct., pg. 425.)

Toronto Suburban Ry.—We are officially advised that construction on the extension from Lambton to Guelph, Ont., is practically finished, there remaining only two sidings and a Y at Guelph to put in. The material has been ordered for all of the overhead work, and the stringing of the wire was commenced at the Guelph end Nov. 3. It is the company's intention to take power from the Toronto & Niagara Power Co. at Islington, where a substation is to be built. This substation, for which the greater part of the material has been delivered, will be of galvanized iron with concrete floor. Some of the cars, which are being built at Preston, Ont., are expected to be delivered early in December. It is expected that everything will be ready so as to permit the operation of the line to Guelph early in Jan., 1917.

Transcona, Man.—At a meeting of the St. Boniface, Man., City Council, Nov. 14, it was stated that the Winnipeg Electric Ry. was negotiating with the Transcona Town Council in regard to building an electric railway to serve that town.

Work is Reported to Have Been Started at Calabogie, Ont., upon the development of an electric power plant at the foot of Lake Calabogie, an expansion of the Madawaska River. It is expected to develop 5,000 h.p., and to transmit the power either wholly or partly to Renfrew, a distance of 20 miles. Mr. J. O'Brien is the principal promoter of the new plant.

Toronto Civic Ry. Wages.—On Oct. 1 the wages were advanced as follows:—Conductors and motormen increased from 27¼c to 30c for week days and from 31¼c to 34c for Sundays. Car repairers and shedmen increased from 27¼ to 30c for week days and from 30¼c to 32½c for Sundays. No difference in pay is made on account of length of service.

Moose Jaw Electric Railway Employees Wages.

On application by the Moose Jaw Electric Ry. conductors and motormen, members of the Amalgamated Association of Street & Electric Railway Employees of America, Division 614, a board of investigation and conciliation under the Industrial Disputes Act was appointed by the Minister of Labor recently. The men's complaints were in regard to wages, hours of labor, working conditions and nonrecognition of the union. The wages paid up to Dec. 16, 1914, were as follows per hour: 1st 6 months 27½c, 2nd 6 months 30c, 2nd year 32½c, 3rd year and after 35c. From that date the company reduced the wages 10%, stating that the reduction was due altogether to conditions which were prevalent throughout the country and that as soon as times changed for the better the reduction would be removed. In February, 1915, a further reduction of 5% was made, making a total reduction of 15%. The company contended that conditions had not improved sufficiently to warrant it in fully restoring the rates paid prior to Dec. 16, 1914, but on July 21, 1916, issued a bulletin stating that the rates from July 16 would be: 1st 6 months 26c, 2nd 6 months 26½c, 2nd year 27½c, 3rd year 30c. The men not being satisfied, the company on Aug. 31 offered the following rates: 1st 6 months 26c, 2nd 6 months 26½c, 2nd year 28½c, 3rd year 31c. The men refused this offer and applied for a board of investigation, etc., at one of the meetings of which the men's representative suggested the following rates as a compromise: 1st 6 months 26c, 2nd 6 months 27c, 2nd year 29c, 3rd year 32c. The company, through its Superintendent, expressed its willingness to pay 5c an hour extra on legal holidays. The matter was then submitted to the men at a meeting, when they repudiated their representative's offer of a compromise and decided to leave the matter to the board. The board being unable to agree, the chairman, J. H. Wellington, and the men's representative, Jas. Somerville, presented a majority report embracing a draft agreement fixing the wages up to August, 1917, as follows: 1st 6 months 26c, 2nd 6 months 27c, 2nd year 29c, 3rd year 32c.

The agreement embodied in the board's report was drafted to be made between the company and the Amalgamated Association of Street and Electric Railway Employees of America, as representing the men affected by it. It also provided that 9 hours should constitute a day's work and should be observed as far as operating conditions would permit. Five cents an hour to be paid for statutory holidays. Conductors and motormen to be allowed 15 minutes for reporting time prior to taking cars out and 15 minutes additional time for pulling away cars taken out of the service. Seats to be supplied by the company on all cars for conductors' and motormen's use when on duty, except in restricted areas. Conductors to be advanced \$30 for purchase of tickets and for change, and to have badges entitling them to transportation at all times over all lines. Other provisions were that the company had no objection to an employee being a member of the Amalgamated Association of Street and Electric Railway Employees of America, and would not discriminate against him therefor. The company to recognize a committee of the men in discussing any grievances of employees. Any employee suspended or dismissed to be reinstated if on investigation it be shown that he was not guilty

of the cause alleged.

The third member of the board, Jas. Thomson, representing the company, presented a minority report, in which, after stating that all the company's receipts were being paid out for operation, and that no dividends had been paid for two years, he contended that the company's offer of 26c, 26½c, 28½c and 31c, according to length of service, was exceedingly fair, and that he could not agree to recommend any higher rate. The conductors and motormen agreed to accept the board's majority report, but the company stated that the same was unacceptable in many respects.

Regina Municipal Railway Earnings.

Earnings, expenses, etc., for September and October, and for 10 months ended Oct. 31:—

	Sept.	Oct.	Jan. 1 to Oct. 31, '16.
Gross earnings	\$14,742.46	\$17,890.99	\$169,728.96
Expenses	13,737.96	13,232.98	156,575.50
Net earnings	1,004.50	2,658.01	13,153.46
Capital charges . . .	8,022.96	8,022.95	80,229.60
Deficit	6,977.15	5,364.94	68,159.48
Exp. per car mile without power . . .	13c	14.03c	15.31c
Exp. per car mile with power . . .	18.04c	19.49c	20.48c
Power per k.w.h. . .	1.41c	1.41c	1.73c
Power per k.w.h. per car mile . . .	5.03c	5.47c	5.18c
Platform wages per car hour . . .	70.59c	71.27c	72.16c
Exp. percentage without capital charges			85.14%
Exp. percentage with capital charges			129.98%

The Relationship of Public Utilities to the Public.

In an address before the Halifax Commercial Club, Oct. 26, H. R. Mallison, of Montreal, Secretary to the President, Halifax Electric Tramway Co., said among other things:—

"The relations between a public utility and the general public, particularly when that public utility operates both tramway, electric light and gas services, is one that is full of complications of all sorts. There is no doubt that the relations between the public utility and the general public are never very pleasant or favorable ones, for the reason that the public utility makes too generous an effort to please all its clients; while on the other hand, the general public seems to think that the public utility simply takes away their money, pays no wages or other expenses, and gives the public nothing in return.

"Under present day practice, the owners of public utilities have really very little to say with regard to the conduct of their business, and the general public has a great deal to say as to how the utility shall conduct itself: what it shall do and how much it shall charge for its services rendered. This situation arises through the operation of the public utilities commissions, and the every action of the public utility, whether it be the class and amount of service rendered, the price it shall charge for the services rendered, what revenue, if any, the owners of the property shall receive on their investment, how much capital they shall issue upon their properties, and how they shall expend that capital, is all subject to the will of the people of the community, through the rules and regulations laid down by the public utilities commissions.

"Considering these conditions it should be seen that the general public,

instead of continually obstructing the progress of the public utility in any city, should, for their own best interests, aid the utility to conduct its business as economically and as satisfactorily as possible."

Mainly About Electric Railway People.

Lieutenant Governor McKeen, of Nova Scotia, who died at Halifax, Nov. 13, was formerly President, Halifax Electric Tramway Co.

W. D. Reid, Traffic Manager, and F. Phillips, Master Mechanic, Port Arthur Civic Ry., have been appointed examiners of motormen.

W. N. Myles, who was Manager of the Hamilton & Dundas Ry. some years ago, died in St. Joseph's Hospital, Hamilton, Ont., Nov. 2, aged 69, after an illness of several weeks.

Lt. Col. G. C. Royce, General Manager, Toronto Suburban Ry., is to command another battalion of the Queen's Own Rifles, Toronto, which is to be organized for overseas service.

Thomas Ahearn, President, Ottawa Electric Ry., is said to hold the record for the fastest run by motor between Ottawa and New York, viz.: 458 miles in 13 hrs. 20 min.

W. T. Woodroffe, formerly Superintendent, Edmonton Municipal Ry., and prior to that in the British Columbia Electric Ry. Co.'s service, whose death was reported in our last issue, enlisted in the 51st Battalion at Edmonton, Alta., as a private in the autumn of 1915. The battalion was broken up in England and the men drafted into various other battalions on active service, during which Mr. Woodroffe received two stripes. It is believed that he was in the 29th Battalion of Edmonton when he fell.

J. P. McKenzie, Assistant Superintendent and Electrical Engineer, Saskatoon Municipal Ry., left Saskatoon, Sask., Nov. 8, 1916, for St. Johns, Que., having been appointed a lieutenant in the Canadian Engineers, C.E.F. He was appointed Master Mechanic when the Saskatoon Municipal Ry. started operating in Dec., 1912, and was promoted to Assistant Superintendent and Electrical Engineer in Jan., 1916. H. Swail has been appointed Assistant Superintendent (Transportation), and A. Gardiner, Secretary. A. M. Murray, heretofore Foreman of Barn, has been appointed Master Mechanic and Engineer in charge of Overhead.

Safety Equipment, Windsor, Essex & Lake Shore Rapid Ry.—The Board of Railway Commissioners issued order 25613, Nov. 3, directing the Windsor, Essex & Lake Shore Rapid Ry. to equip its 6,600 volt motor cars and locomotives with pneumatic or other suitable pantagraph controlling devices, so that employees may, from within the interiors of the cars and locomotives, lower and release, or raise the pantagraphs. These devices are to be installed within six months, and beginning with Apr. 15, 1917, the remainder of the motor cars and locomotives are to be equipped with the device, a period not exceeding two months being allowed in each case for the equipment of each car and each locomotive.

The Sandwich, Windsor & Amherstburg Ry. has ordered 2 single end, double truck cars, equipped with air brakes, to be built in Cleveland, Ohio.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry., and allied companies:—

	Sept.'16	Sept.'15	July 31 to Sept.30,'16	July 31 to Sept.30,'15
Gross . . .	\$540,440	\$517,022	\$1,629,026	\$1,534,871
Expenses 477,389		477,206	1,428,641	1,448,479
Net . . .	63,051	39,816	200,385	86,392

During October, 2,194,594 passengers were carried on the Vancouver city and suburban lines, a decrease of 55,956, as compared with Oct., 1915. The percentage paid to the city for traffic on the city lines was \$3,816.25, making an aggregate paid the city for 10 months ended Oct. 31, of \$29,878.60. The mileage run on the Vancouver system for October was 565,610, compared with 562,969 for Oct., 1915.

Cape Breton Electric Co.:—

	Sept. 1916	Sept. 1915	12 mths. to Sept.30, 1916	12 mths. to Sept.30, 1915
Gross \$33,804.16		\$33,639.17	\$385,443.87	\$344,372.41
Exp's 18,189.45		18,183.93	225,937.48	207,269.74
Net 15,614.71		15,455.24	159,506.39	137,102.67

Hamilton St. Ry.—Total earnings for nine months ended Sept. 30, \$522,922, against \$410,963 for same period, 1915. City percentage for 1916 period, \$41,833, against \$32,877 for 1915 period.

Lake Erie & Northern Ry.—At a meeting of the Brantford, Ont., City Council, Oct. 30, it was reported that the \$30,000 agreed to be paid by the company for the part of the right of way of the old Grand Valley Ry. from Paris to Galt, would be paid over to the City Treasurer at an early date.

London St. Ry.:—

	Sept. 1916	Sept. 1915
Gross earnings	\$39,925.54	\$38,791.55
Expenses	23,287.02	23,192.87
Net earnings	16,638.52	15,598.68

Port Arthur Electric Ry.—Passenger traffic statistics for nine months ended Sept. 30:—

	Three months ended Mar. 30	Three months ended June 30	Three months ended Sept. 30
Passengers	465,219	549,034	744,828
Transfers	49,916	59,558	146,530
Workmen's t'kts 89,377		123,891	173,068
School children. 5,228		5,587	6,072

Sherbrooke Railway & Power Co.:—

	Aug. 1916	Aug. 1915	July 1 to Aug. 31, 1916	July 1 to Aug. 31, 1915
Gross \$14,910.47		\$10,720.68	\$29,021.26	\$23,279.75
Expenses 7,010.41		5,860.43	13,320.89	11,543.19
Net .. 7,900.06		4,860.25	15,700.37	11,736.56

Toronto Railway:—

	1916	City percentage	1915	City percentage
Jan.	\$473,784	\$68,847	\$471,226	\$70,486
Feb.	470,704	70,614	440,313	66,047
Mar.	518,555	97,237	488,468	93,141
Apr.	496,172	99,234	467,701	93,540
May	500,516	100,103	468,953	93,790
June	467,086	93,417	450,582	90,116
July	469,845	93,969	449,108	89,821
August ...	474,824	94,964	447,968	89,593
Sept.	506,621	40,530	489,574	39,166
Oct.	487,954	39,036	461,682	36,934

\$4,866,061 \$797,951 \$4,635,575 \$762,634

Toronto Ry., Toronto & York Radial Ry., and allied companies:—

	Sept.'16	Sept.'15	Jan. 31 to Sept.30,'16	Jan. 31 to Sept.30,'15
Gross . . .	\$913,535	\$804,902	\$8,005,764	\$7,150,605
Expenses 452,979		354,995	4,087,653	3,635,042
Net . . .	460,556	449,907	3,918,111	3,515,563

It is announced that W. A. Reid & Co., New York, have purchased and resold \$1,250,000 gold notes bearing interest at 6%, \$500,000 maturing Dec. 1, 1917, and the balance Dec. 1, 1918.

Toronto & York Radial Ry.—The Mayor of Toronto stated to the Board of Control recently that he had had a conference with Sir Adam Beck regarding the proposed purchase of the Toronto & York Radial Ry., Metropolitan Division, by the Hydro Electric Power Commission

of Ontario, in accordance with the council's resolution of Dec., 1915, and was informed that negotiations are proceeding and are still pending, and are part of the general hydro radial programme which has been more or less delayed because of the war and the financial situation, but that satisfactory progress is being made.

Winnipeg Electric Ry.:—

	Sept.'16	Sept.'15	Jan. 31 to Sept.30,'16	Jan. 31 to Sept.30,'15
Gross . . .	\$267,497	\$261,982	\$2,461,454	\$2,513,449
Expenses 179,644		185,256	1,582,571	1,666,849
Net . . .	87,853	76,726	878,883	846,600

Electric Railway Notes.

The Vancouver Trades and Labor Council has asked the Vancouver City Council to compel the British Columbia Electric Ry. to place heaters in all new street cars.

The assessment placed upon the Montreal Tramway Co.'s plant, etc., for city taxation during the past year was \$5,519,455, made up of land, \$2,361,160; buildings and plant, \$1,955,025; plant on streets, \$1,203,270.

The military authorities are discussing with the Regina, Sask., City Council an arrangement whereby soldiers in uniform quartered in the city during the winter will be carried at reduced fares on the Regina Municipal Ry.

The Quebec Ry., Light & Power Co. is building in its shops at Ste. Anne de Beaupre, 2 double truck cars of the p.a.y.e. type, 40 ft. long over all, for city service. They will be numbered 654 and 655, and will be equipped with S.W.B. double trucks and T.M.C. steel tired wheels, Westinghouse 101-B-2 quadruple motor equipment and Westinghouse S.M.E. air brakes.

The Lake Erie & Northern Ry. obtained an order in an Ontario court, Nov. 13, appointing arbitrators to fix the compensation to be paid by the City of Brantford for lands taken on Jubilee Terrace. The Parks Board of the city council asks \$15,000, and the company offers \$1. Judge Hardy will act as arbitrator for the city; A. E. Watts, K.C., for the company, and Judge Snider, Hamilton, will be Chairman.

In order to relieve congestion of traffic at the corner of Hastings and Main Sts., Vancouver, the British Columbia Electric Ry. has placed an extra conductor there between 4.30 and 6.30 p.m. on week days and between 12.30 and 1.30 p.m. on Saturdays, to collect fares and see people at the front end of the cars while the regular conductor does the same at the rear end. This gets the cars filled more quickly and dispatched faster.

The Board of Railway Commissioners has dismissed an application by Major G. T. McKeough for an order directing the Chatham, Wallaceburg & Lake Erie Ry. to give to persons carrying on business or professions in Chatham, Ont., but living in portions of Raleigh and Harwich Tps., served by the railway, and also to their families, a rate not to exceed 25c for a round trip ticket when such tickets are bought in book form as commutation tickets.

In connection with the 13 double truck, double end operation cars which are under construction for the Toronto Civic Ry. by the Preston Car & Coach Co., all the contracts for equipment were placed at the same time as that for the bodies, except those for gears and pinions and air brake equipment. These have since been placed, for the gears and pinions, with

Allen General Supplies, Ltd., at \$121.60 a car set; and for the air brake equipment, with Canadian Westinghouse Co., at \$365.60 a car set. In quoting the average price per car, at the time of placing the contracts, at \$8,620.50, the gears and pinions were estimated at \$108.98 a car set, and the air brake equipment at \$350 a car set.

Calgary Municipal Ry. Earnings.

Following are the earnings, expenses, etc., for September, compared with those for Sept., 1915, and aggregate for 9 months ended Sept. 30, 1916 and 1915:—

	1916.	1915.
Total revenue	\$48,486.32	\$41,972.30
Operating expenses	29,246.43	29,779.18
Net earnings	19,239.89	12,193.12
Fixed charges	16,910.26	16,187.94
Surplus	2,329.63	—
Deficit	—	3,994.82
Mileage	220,772	209,265
Passengers carried	1,116,575	990,875
Revenue per car mile	21.962c.	20.056c.
Expenses per car mile	13.44c.	14.23c.
Expenses per car hour	\$1.32	\$1.52
Power per car mile	3.364c.	3.474c.
Average fare	4.278c.	4.093c.
Operating expenses to revenue	67.4%	70.8%

	9 months to Sept. 30, 1916.	9 months to Sept. 30, 1915.
Total revenue	\$446,325.96	\$409,723.85
Operating expenses	266,652.91	272,324.13
Fixed charges	163,367.37	146,351.13
Surplus	16,305.68	—
Deficit	—	8,951.41

The Jitney Situation in Vancouver.—The Vancouver Social Service Council has been taking up the question of the jitney service recently and has begun an active crusade for more effective regulation upon moral grounds. It asks particularly for the prevention of overcrowding and for the internal lighting of all cars. The public authorities in every place where jitneys are being operated are being invited to join in taking action to prevent the extension of immorality through the jitney traffic. The Vancouver police have been instructed to enforce the existing regulations more rigidly than in the past, and the whole question of the regulation of the traffic is under consideration by a subcommittee. The British Columbia Electric Ry. is objecting to the jitney traffic on the ground that it is an unfair competition. The Jitney League and the Jitney Protective Association, the two organizations of jitneymen, decided, Oct. 28, to amalgamate their forces for the better protection of their interests.

Buffalo Night Service.—The International Ry. Co., of Buffalo, N.Y., started an innovation recently, as far as owl car service is concerned, which will be a great benefit to patrons. On main lines a 30 min. service is maintained, and hourly service on other lines. In order that patrons may know when to expect a car at a certain point, arrangements have been made whereby a person may call up the dispatcher, who has before him the various schedules and arriving times at the transfer points. He is thus able to estimate the arriving time at any given point on any line.

Postmen's Transportation on Regina Municipal Ry.—Commencing Nov. 1, the Regina Municipal Ry. ceased to carry postmen except upon payment of regular fare. Under the former contract they were carried for \$25 a man per year, which the management found was giving the railway only a trifle over 1c a ride. The City Commissioner therefore asked \$50 a year, which the Post Office Department refused to give, offering \$35 instead.

Marine Department

Government Vessel Building at Sorel.

Following are particulars of vessels which have been built this year, or are being built at the Dominion Government's shipbuilding yard at Sorel, Que., of which W. S. Jackson is Superintendent:—

Coal Barge No. 6 has the following general dimensions:—Length between perpendiculars 165 ft.; length over all 172 ft.; breadth moulded 32 ft.; depth

perpendiculars 77 ft.; length over all 85 ft.; breadth moulded 18 ft.; depth moulded 7 ft.; deadweight 21 tons; speed 9½ miles. She is composite built, having steel framework, with planking of rock elm below waterline and B.C. fir above, with keel, stem and sternpost of white oak, and is to be used by the Naval Service Department for inspection of the oyster fisheries, with headquarters at

in. Steam steering engine and steam windlass are fitted and electric light is fitted throughout. One mast, with derrick to lift 3,000 lb. is fitted. Good accommodation for staff, captain, officers and crew are provided. The deckhouse on main and upper decks are of steel. She was launched in August and will be completed and tried before the winter.

The **Argenteuil** has the following gen-



C.G.S. Berthier

moulded 13 ft.; deadweight 750 tons; speed 11½ miles.

The barge is of steel throughout, with 5 watertight bulkheads. There is a double bottom under engines and a large forepeak tank for trimming purposes.

The barge will be used for coaling the St. Lawrence Ship Channel dredges which work below Quebec. She is fitted with a Brownhoist steam crane and clam of 54 cu. ft. capacity, the crane being also arranged with blocks to lift up to 6 tons,

Charlottetown, P.E.I. The machinery consists of a set of compound surface condensing engines, having cylinders 10 and 20x12 in., supplied with steam from a Scotch boiler 8½ ft. diam. by 8¼ ft. long, with a working pressure of 120 lb. per sq. in. There is also a steam steering gear, and a 2 barrel steam winch of 1 ton capacity, for handling the oyster trawls tins, is placed below deck but is controlled from the wheelhouse. This vessel is already in service.

eral dimensions:—Length between perpendiculars 94 ft.; length over all 101 ft. 5 in.; breadth moulded 21 ft.; depth moulded 8 ft.; deadweight 40 tons; speed (estimated) 9 miles. She is built of steel throughout with bottom and bilge plating protected by B.C. fir sheathing, as she will work in shallow and rocky waters. There are three watertight bulkheads and a forepeak tank for trimming purposes. She is for the use of the Marine Department for buoy service on Lake St.



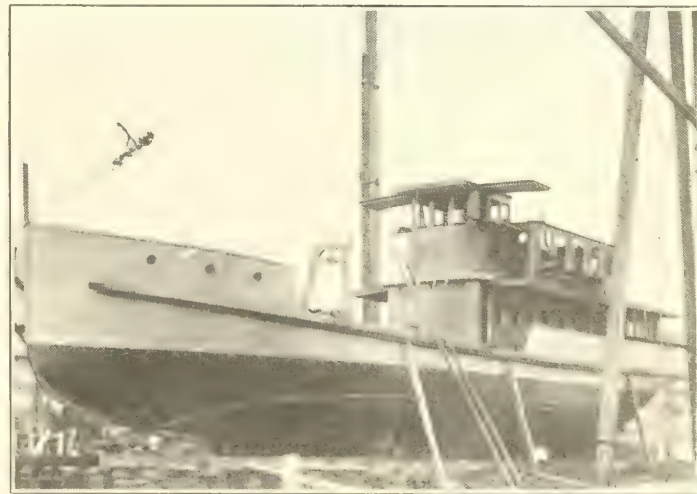
C.G.S. Ostrea

so that the barge can be used in the buoy service in the spring and autumn.

The barge has been built fully up to Lloyd's highest class to enable her to go to sea, if necessary, and is fitted with compound surface condensing engines having cylinders 20 and 42x24 in. stroke, supplied with steam from a Scotch boiler 15 ft. diam. by 11 ft. long, working pressure 130 lb. Steam steering gear and steam windlass are fitted. This barge was completed and put in service in the early summer.

The **Ostrea** has the following general dimensions:—Length between perpen-

The **Berthier** has the following general dimensions:—Length between perpendiculars 120 ft.; length over all 128 ft.; breadth moulded 24 ft.; depth moulded 12½ ft.; coal capacity 45 tons; speed (estimated) 12 miles. She is of steel throughout, with 5 watertight bulkheads, and is for the staff engineers of the St. Lawrence Ship Channel below Quebec. She is propelled by twin screws, having 2 sets of compound surface condensing engines, having cylinders 14 and 28x18 in. stroke, supplied with steam from a Scotch boiler 15 ft. diam. by 11 ft. long, at a working pressure of 130 lb. per sq.



C.G.S. Argenteuil

Louis, Ottawa River, etc., and replaces the **Maisonneuve** and derrick scow. The machinery consists of single screw jet condensing engines having cylinders 10 and 20 x 16 in. stroke, supplied with steam from a Scotch boiler 9½ in. diam. x 10 ft. long, at a working pressure of 130 lb. per sq. in. Steam steering gear, steam windlass and electric light are fitted, also a steam winch with mast and derrick capable of handling buoys up to 4 tons weight. There is good accommodation for staff, captain, officers and crew. She was launched in October and will be ready for service in the spring.

Toronto, Hamilton and Buffalo Navigation Co's Car Ferry Maitland No. 1.

As announced in our last issue, the Toronto, Hamilton & Buffalo Navigation Co., a subsidiary of the Toronto, Hamilton & Buffalo Ry., has commenced a car ferry service between Port Maitland, Ont., and Ashtabula, Ohio, thus forming a connection between the T.H. & B.R., C.P.R. and other Canadian lines, and the New York Central and other lines in the U.S.

The dimensions of the car ferry Maitland No. 1, are: Length over all 350 ft.; length on keel 338 ft.; breadth moulded 56 ft.; depth at side to main deck 20½ ft.; height between main deck and shelter deck 17 ft. 7 in.; gross tonnage, 2,757.

She is of steel throughout, of the shelter deck type, with 4 tracks on the main deck for cars. The shelter deck has steel deck houses for the accommodation of the officers and crew. The pilot houses are located fore and aft, and the bridge on the top of the forward deck house and

complete with valves and pipes; 1 double funnel for each pair of boilers, and 2 ash guns in boiler room.

The propelling machinery consists of 2 vertical triple expansion engines with cylinders 19½, 31 and 52 in. diam. x 36 in. stroke, arranged with the h.p. cylinder in the centre, supplied with steam by 4 single ended Scotch boilers, each 13 ft. 2 in. x 11½ ft., at 175 lb. working pressure.

There is accommodation on the vessel for 30 cars arranged on 4 tracks on the main deck, and the working speed is 12 statute miles an hour. Capacity, 2,000 net tons dead weight on a mean draught of 14 ft. The run between Port Maitland and Ashtabula is 91 miles, and ordinarily three round trips are made in 48 hours. The car ferry was built by the Great Lakes Engineering Works, Detroit, Mich.



Toronto, Hamilton and Buffalo Navigation Co's Car Ferry Maitland No. 1.

also on the top of the forward pilot house. The hull is divided into compartments by 7 watertight transverse bulkheads, one in way of each coal bunker. Four single ended Scotch boilers are placed amidships with one thwartship fire hold and a wing coal bunker on each side in way of boiler room. The triple expansion engines are in a compartment next abaft the boiler room.

The following items are included in the general equipment of the vessel:—1 steam fire pump in engine room connected to a 2 in. pipe extending the whole length of the vessel on each side; 1 steam sanitary pump in engine room; 1 two-cylinder hand deck pump in engine room; a complete electric light installation, consisting of two 15 kw. direct connected generating sets; complete wireless telegraph installation; a refrigerator in the after deck house, fitted with drinking water coil set; 2 sets of engine room telegraphs for each engine; steering telegraph from top of pilot house to after end of shelter deck; 2 sectional propellers 12 ft. diam.; 1 air pump 30 x 18 in., simplex type; 1 cold water pump, independent duplex, 6 x 4 x 6 in., standard marine type; 1 bilge pump, independent duplex, 7 and 10 x 10 in.; 2 boiler feed pumps, independent simplex, 12 and 7 x 12 in.; 1 fire pump, outside centre packed positive valve type, 12 and 8 x 12 in.; 4 purifiers

Stranding of the s.s. Indutiomare.

An investigation into the causes of the stranding of the Belgian s.s. Indutiomare on White Horse rock, Magdalen Islands, Aug. 19, was held at Halifax, N.S., Oct. 13, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. A. J. Morrison and Lieut.-Commander C. Adam, R.N.R., as nautical assessors. The court found that through over confidence in the action of his compass, the master, Henry Matthews, decided to proceed under hazy weather at full speed, which was not considered immoderate in this instance, and after running a certain distance and seeing land on his starboard bow, which he expected to find on his port bow, instead of stopping his vessel or retracing the distance he had come, in order to take the course originally intended, he proceeded after taking some cross bearings which proved either to be hastily or negligently done, as they did not coincide. It was of opinion that the errors of the compass were incorrectly deducted from the observations, and found that his deviation is marked west when it should have been east, which may account for the application being wrongly made. The court expressed the opinion that in attempting to pass a couple of miles from Deadman's Island and steering a course for North Cape,

P.E.I., and making Deadman's Island as a point of departure afterwards to steer for Cape North, Cape Breton, the master was making rather close sailing for a stranger in these waters, and a peculiar method of choosing a point of departure in selecting such a place as Deadman's Island. If he had studied the sailing directions he would have found an irregularity of tides and lack of anchoring grounds, and he should have avoided that part of the land to a greater extent than he did. It therefore found that he did not exercise the judgment which is looked for in a master. As the court has no jurisdiction over a foreign certificate, a copy of the court's finding, with the evidence, has been transmitted to the Belgian Government so that it may deal with the matter as it thinks fit.

Reported Rearrangement of North Atlantic Shipping Companies.

A Glasgow, Scotland, press dispatch states that important negotiations are taking place with a view to a large development in the shipping service between Great Britain and Canada. It is stated that there will be a regrouping of the companies, affecting the Canadian Pacific, Allan, Canadian Northern and Cunard Lines. The information contained in the dispatch is somewhat belated, as some of the movements in the so-called regrouping have already been made. The C.P.R. has had control of the Allan Line for a considerable period, and the two lines are being managed by Canadian Pacific Ocean Services, Ltd., until the trend of international events makes it advisable, in the directors' opinion, to make other arrangements. The White Star and Dominion Lines, which, according to the dispatch, are to form a group in the rumored rearrangements, have been operating to Canada as one concern for several years as the White Star-Dominion Line. The third group mentioned includes the Cunard, Anchor, Canadian Northern and Donaldson Lines. So far as these are concerned, the Cunard Line has absorbed Canadian Northern Steamships, Ltd., and has obtained, at least, controlling interests in the Anchor and Donaldson Lines. Therefore the promised sensational developments may as well be put down to a news agency's intelligent anticipation of past events.

Vancouver Dry Dock.—The Amalgamated Engineering and Dry Dock Co., which was organized before the war, but which was prevented by the financial situation from proceeding with its plans, is reported to have announced that within a few weeks it will commence the construction of its proposed dry dock and ship-building plant. It is stated that financing has been arranged in the East, and that work will be proceeded with on the site near the Wallace Shipyards, North Vancouver, B.C., almost immediately. In 1914 the company applied to the Dominion Government for aid under the act granting aid to dry dock building and an order in council was passed indicating the Governments willingness, provided the undertaking was financed, to subsidize a dock of the following dimensions:—Length from caisson stop to head wall, 1,150 ft.; width of entrance, 110 ft.; depth over sill at extreme high water spring tides, 41 ft.; depth over sill at low water spring tides, 24.25 ft. The estimated cost of the dock is \$5,458,418.37, and the subsidy mentioned in the order in council is 4% per annum for 35 years.

Customs Drawback for Shipbuilding in Canada.

For some years past it has been evident that the Canadian shipbuilders of the Dominion have been placed at a disadvantage in competing with shipbuilders in other parts of the world, and efforts have been made from time to time to induce various governments to encourage the building of vessels within the Dominion, by the payment of a subsidy on a tonnage basis, or in some other manner, but without success. Canadian purchasers generally preferred to place their orders for new vessels in Great Britain, where the cost of production was considerably lower, and better financing arrangements could be made. Apart from the higher cost of labor in local yards, the builder was further hampered by the heavy duty he was compelled to pay on the materials which he imported, and it was mainly to this item that he looked for relief. Numerous deputations have been received by the present Government and its predecessor, and recently it was intimated that the Government intended taking steps to enquire into the situation. This was rendered imperative by the conditions created by the war. It is a practical impossibility to obtain deliveries of vessels from British shipyards, as when they are not already engaged on Admiralty work, they are heavily booked with other orders. The wastage of vessels in war service, in which a number of Canadian vessels are engaged, has made it necessary that a considerable number of new ones be built without delay, and this applies to other countries, which, although neutral, have suffered heavy losses through the illegal sinking of their vessels by the enemy. Of late, Norway has been, perhaps, the heaviest loser in this respect, and British shipbuilders being practically closed so far as new orders are concerned, orders have to be placed elsewhere, and numerous offers have been made to Canadian builders, and some orders placed. There is a restriction on the exportation of Canadian, or Canadian built vessels to foreign countries, but under the circumstances existing the necessary permission has been granted.

An order in council has been passed providing for the granting of a drawback of customs duty on articles used in the construction of vessels built in Canada, dating from Nov. 1, as follows: A drawback not exceeding 99% of the customs duty paid, may be granted and paid by the Minister of Customs on materials used in the original construction of ships and vessels measuring over 500 tons gross tonnage, built in Canada, when such ships or vessels are authorized by order in council to be exported for registry outside of Canada, or are British registered in Canada and are constructed so as to obtain a class in Lloyd's, Bureau Veritas, British Corporation, or other recognized classification satisfactory to the Minister of Customs; provided that the drawback payable under this section shall be in lieu of any drawback based on a specific rate per registered ton. The claimant for drawback must be the builder of the ship or vessel. Drawback shall be paid only on ships or vessels which have within themselves the power of independent navigation, either by means of sails, steam or other motive power. The payment of the drawback shall be subject to the following conditions: The quantity of materials used and the amount of duty paid thereon shall be ascertained; the claimant for drawback shall be required to make a declaration to the effect that he

is the builder and the claimant for drawback, that the vessel was built in Canada and is an entirely new vessel, and giving details of classification; there shall be furnished by the claimant a certificate from the Registrar of Shipping, certifying the main details of construction; the claim for drawback shall be verified under oath before a collector of customs or justice of the peace, to the satisfaction of the Minister of Customs, in such form as he shall prescribe, and the Minister may also require in any case the production of such further evidence, in addition to the usual averments, as he deems necessary to establish the bona fides of the claim; all applications for payment of drawback shall be placed before the Customs Department, with evidence as above mentioned complete, within six months from the date of registration or launching of the ship or vessel upon which the claim is made, otherwise the same shall be rejected. It has also been arranged that vessels which are being built under this order in council, may, upon application of the builders, be built under the supervision of a customs officer, who will carry the responsibility connected with the imported material used in the construction, and under these circumstances it will not be necessary to pay the duty over, as was formerly done.

A study of the terms of the order in council, taken in conjunction with drawbacks previously allowed on material imported for re-export, and of the drawback based on the specific rate of \$1.12 per registered ton, brings out the fact that the benefit under the new order is not so apparent as at first sight. There has always been allowed a drawback of 99% on all materials imported and re-exported, and this applied to vessels of any tonnage, while in the new order the drawback is confined to vessels of over 500 tons gross. Again the drawback is only payable on ships or vessels which have within themselves the power of independent navigation. This eliminates dredges from the vessels on which drawback is payable. Therefore the only actual benefit to be derived from the new order is that drawback will be paid on vessels of over 500 gross tons, having within themselves the power of independent navigation and built for British registration in Canada, and that vessels may be built for registry outside Canada. No drawback will be payable on vessels of less than 500 gross tons, nor on vessels without the independent power of navigation, such as dredges, and the drawback on vessels built for British registry in Canada, based on the specific rate of \$1.12 a registered ton, is eliminated.

The Western Dry Dock and Shipbuilding Co.'s plant at Port Arthur, Ont., which has, since its inception, been practically under U.S. control, has passed into the hands of James Whalen, Port Arthur, who has been President since its organization, and John Burnham, Chicago, Ill., and will in future be under the former's direct management. It is announced that plans for additional berths for increasing the company's output are under consideration, and it is hoped that shortly it will be possible to undertake the construction of four vessels at a time. Mr. Whalen is reported to have stated that it is intended to maintain a permanent organization, and should contracts at any time not be sufficient, it is the intention to build on company's account.

A Welcome Test.

The Interstate Commerce Commission has included the C.P.R. and the Grand Trunk Pacific Coast Steamship Co. in the probe instituted by Delegate James Wickersham, of Alaska, for political effect. The probe covers Alaska rates by water and rail and in itself is hardly worth detailing as the contention is so well known. The U.S. lines, parties to the suit, are amenable to the Interstate Commerce Commission, but the great test, and one that is most warmly welcomed, is the effort of the Commission to include the Canadian steamships in the process of strangulation which the Commission is supposed to conduct under its unlimited powers. From a purely legal and diplomatic viewpoint, the two Canadian steamship companies can, and they certainly should, ignore the Commission's summons. Every law governing maritime commerce is distinctly at variance with an attempt by a U.S. railway regulating body, created and operated upon political lines, to interfere with a foreign steamship. Without any assumption or suggestion that the Canadian lines are guilty or not guilty of error or irregularity, the question resolves itself into one whereby a foreign steamship company, operating between Canadian and U.S. ports, is or is not subject to the heckling laws of a Commission created for the purpose of regulating interior railroad rates within one nation. That the Interstate Commerce Commission has no authority to regulate U.S. steamships in the coastwise trade will undoubtedly be finally passed upon. The point at issue is that the Commission has made the Canadian steamship lines parties to this probe and these Canadian steamship lines have it in their power not only to refuse to obey the summons but can laugh at the Commission and thus administer a well deserved rebuff to this meddlesome body. All they have to do is to file their reply with the British Ambassador at Washington, D.C. Every transportation man is delighted at the turn of affairs, for it is a well known fact that the Canadian lines control a large portion of the South-eastern Alaska business owing to the superior class of vessels operated, and it is a foregone conclusion that they are going to continue such operations without fear of interference from the notoriously inefficient and politically governed Interstate Commerce Commission.—Railway and Marine News, Seattle, Wash.

Nationality of Radiotelegraph Operators.—The following has been added to the Dominion Radiotelegraph Regulations:—88. (a) No person shall be permitted to attend examination for any class of certificate of proficiency in radiotelegraph (1) who is not a British subject; (2) who has at any time been of enemy nationality; (3) whose parents were not of British nationality at the time of his birth; (4) whose parents have at any time been of enemy nationality; (b) Candidates for examination for first class certificates of proficiency must be not less than 18 years of age; (c) This regulation shall take effect Oct. 15, 1916, and shall remain in force until the cessation of hostilities, unless sooner repealed.

Vancouver Dry Docks, Ltd., has been incorporated under the British Columbia Companies Act, with \$100,000 authorized capital, and office at Vancouver, to own and operate docks, wharves, warehouses, elevators, steam and other vessels, dry docks, etc.

British Columbia Legislation to Encourage Shipbuilding.

In addition to the aid to shipbuilding by customs drawback, provided by the Dominion Government, the British Columbia Government has, by the British Columbia Shipping Act, described as an act respecting shipping and to make provision for aid to the shipbuilding industry in British Columbia, granted aid in regard to ships and vessels built within the province for service within and to and from ports in the province and outside ports. This bill constitutes a Shipping Credit Commission, consisting of a superintendent and two other directors, with the power of an incorporated company, which may own and operate vessels of all kinds, as well as build and deal in them generally. The superintendent and one director are nominated by the Lieutenant Governor in Council, and the third director is the Deputy Minister of Finance. The Commission is empowered to make loans subject to the provisions of the act and to deal with the necessary collateral securities, and must keep a register of loans. The loans made shall be on vessels built and registered in the province, and made on the written application of the borrower in prescribed form setting forth clearly the purpose for which the loan is required. No loan shall be granted for an amount exceeding 55% of the ascertained value of the vessel, or of the shares offered as security, and the loan may be made in instalments. A commissioner may not deal with any application for a loan by any person with whom he is within the third degree of consanguinity, or who is a partner, or a debtor under a mortgage to any association of which the commissioner may be a director or member.

The following provisions shall be carried out in respect to vessels built under the aforementioned loans:— the plan and specification of the ship shall be approved by the commission, and the ship shall be so built as to obtain a class in Lloyd's or Bureau Veritas, white labor only shall be employed in the construction, and in the subsequent operation and maintenance; such rates of wages as the commission may decide to be a fair wage rate shall be paid; the Superintendent of the commission or such other person as may be approved by the commission shall be the managing owner of the ship until the loan is fully repaid; the ship shall not be sold or transferred except with the commission's consent for five years from the date of the loan and its cargo carrying capacity shall be utilized to the full extent on each voyage outward, and shall be operated continuously to the commission's satisfaction; every charter shall be subject to the commission's approval during the currency of the loan, and the rates of freight on British Columbia shipments shall never exceed the actual rates paid on similar shipments at even dates in the States of Washington and California, and the commission shall have power to ascertain and certify such rates; all insurance and risks during construction shall be made loss payable to the commission as its interest may appear and exist, and such insurance shall be carried in any amount which the commission may deem necessary; the contract with the commission shall contain a provision whereby 1% of the gross earnings of the ship during the currency of the loan shall be paid to a reserve fund of the commission as a payment from the shipping industry ben-

efitted by this act towards governmental risk, cost and expense of passing this act and carrying it into effect. Each loan made by the commission is to bear 6% interest, payable half yearly, and the principal is repayable in five equal annual instalments; provided that should 50% of the net earnings of the ship for any year exceed the annual instalment of principal and interest, then the borrower shall repay a further sum so that the amount paid each year in reduction of the loan shall never be less than 50% of the net earnings of the ship, and never less than 20% of the original amount of the loan, without reference to earnings. In case of default by the borrower, or if the commission considers that the loan or any portion of it shall have been used for any other purpose than that for which it was made, the commission may refuse to pay any unpaid portion of the loan, and one month after demand by registered letter for the repayment of the loan made, may take possession of the whole or any part of the security, and dispose of same by public or private sale, applying the proceeds in payment in the first instance of money advanced under the loan agreement. Any loss which may arise from such sale to be debited to the reserve fund before mentioned.

In aid of the shipbuilding industry, the Government will pay to the owner of each ship, up to a number not exceeding 20, built and launched in the province after the passing of the act, a subsidy in 10 annual instalments, each so computed as to bring the net earnings of the ship up to 15% of the actual cost as certified by the commission in respect of the year whereof payment is made, but so that the subsidy paid in any one year shall never exceed an amount equal to \$5 a ton dead-weight capacity, with provision for a safe freeboard. The first of such instalments shall be paid in respect of the first year after the declaration of peace in the present war, and annually thereafter until the full subsidy is paid. The bona fide user of the ship in the British Columbia trade for outward borne cargoes shall return to some B.C. port for reloading, with liberty to carry return cargo to any port along the generally practicable line of such return. The subsidy shall only be payable to the owner who actually paid for the construction of the ship, or to his assigns who actually operate the ship, and not to any middleman or promoter; it shall not be liable or subject to assignment, attachment, garnishment or any process of execution; and in the event of there being conflicting claims to payment of the subsidy, the decision of the commission shall be absolutely final and binding without appeal.

The act also provides that the commission may, with the sanction of the Lieutenant Governor in Council, enter into contracts for the establishment of shipbuilding, repairing and docking plants in the province on the condition that in respect of such plants securities may be issued not exceeding 55% of the actual cost as certified by the commission, and the due payment of such securities both as to principal and interest not exceeding 6% per annum shall in the first instance be undertaken by the person or company establishing the plant, and shall be unconditionally guaranteed by the Provincial Government, the securities guaranteed constituting a first charge on the

plant and lands.

Advantage has already been taken of this act, chiefly by the Canada West Coast Navigation Co., which has placed orders for the construction of 8 auxiliary powered schooner type vessels for the lumber trade. Six of these vessels are under construction at North Vancouver and 2 at Victoria. Details of these have already been given in Canadian Railway and Marine World.

Dominion Government Dredge for the St. Lawrence Ship Channel.

A large dredge for service in the St. Lawrence ship channel below Quebec was launched at Maisonneuve, Montreal, Nov. 19, and was christened Dredge No. 16 by Mrs. Hazen, wife of the Minister of Marine and Fisheries. The vessel is the largest of its kind in Canada, and will be capable of dredging and discharging into steam hopper barges on either side, or into its own hopper, 1,500 tons of material an hour when working at a depth of 57 ft. The principal dimensions are as follows:

Length between perpendiculars	284 ft.
Length over all	292 ft.
Depth moulded	20½ ft.
Mean draught with hoppers full	16½ ft.
Dredging depth	57 ft.
Angle of bucket ladder	45 degrees
Angle of discharge chutes	25 degrees
Capacity of hoppers	30,000 cub. ft.
Dredging capacity per hour	1,500 tons

The completion of the dredge was delayed somewhat on account of war requirements, but everything will be in readiness for its operation in the ship channel in the coming spring. It was built by Canadian Vickers, Ltd. A full description of the dredge and its equipment was given in Canadian Railway and Marine World for September.

Lock Gate Accidents on the Welland Canal.

The s.s. J. H. Shrigley, with a cargo of coal from Erie, Pa., for Toronto, carried away both foot gates of lock 7 on the Welland Canal, Nov. 5, and caused considerable damage to the surrounding country. It is stated that the vessel entered the lock at excessive speed, and that there was a confusion of signals between the bridge and the engine room. The head gates were saved by the lock tenders, who made them fast with cables. The damage was estimated at \$7,000, and the vessel was detained at Port Dalhousie pending an arrangement for settlement. The break was repaired and navigation resumed Nov. 6.

A second accident occurred Nov. 21, when the s.s. Lehigh, upbound, light, was entering lock 1 at Port Dalhousie. It is stated that her engine centred before the speed could be checked, and she rammed the head gates, both of which were carried away. The damage, which is estimated at \$4,000, was repaired by 10 a.m. Nov. 22 and locking was resumed.

Kendall Bros., Ltd., has been incorporated under the Dominion Companies Act, with \$50,000 authorized capital and office at Montreal, to own and operate facilities of every kind, for the transportation of merchandise, etc., by land, air or water.

The Norwegian s.s. Thorjerd, built by the Western Dry Dock & Shipbuilding Co., Port Arthur, passed through the canals, Nov. 21, on her way to the seaboard via the St. Lawrence. She is to be operated between New York and the West Indies.

The Minister of Marine on Canadian Shipbuilding.

Hon. J. D. Hazen, Minister of Marine, in speaking at Montreal, Nov. 19, after the launching of Dominion Government Dredge No. 16, said that some of the guests present would remember the time when the securing of a 14 ft. channel between Montreal and the sea was regarded as an impossible task, but that had been secured. The Marine Department was working on the task of making a 35 ft. channel from Montreal to the sea, and was not only accomplishing that task, with great success, but was widening and straightening the channel as well. He referred with gratification to the manner in which navigation was being maintained between Quebec and Montreal with hardly an accident, the vessel plying the channel as safely as in any part of the world, due partly to the excellent pilots and partly to the fact that the Dominion Parliament had never begrudged money to make it the most perfectly buoyed and lighted waterway in the world. The new dredge was ordered and built to remove the only obstacle below Quebec to having as safe a waterway to the Atlantic as was possible, and he would be both surprised and disappointed if it did not bring about a reduction in the insurance rates now charged on vessels employed on this route, and their cargoes.

He referred to the ice-breaker built for the Dominion Government recently, but sold to the Russian Government to keep the port of Archangel open as long as possible. The Earl Grey and the Minto had also been sent by the Canadian Government as a contribution towards helping Russia in the war. He told of the dire prophecies of ruin indulged in when the Canadian Vickers plant was first established, and gave a short resume of the great aid given not only to Canadian shipping, but to the British Government by the company.

He gave some important statements regarding the establishment during the war of shipbuilding in Canada on a permanent and profitable basis. In addition to the plants, splendidly equipped for the construction of steel ships, in New Glasgow, Montreal, Kingston, Toronto,

Collingwood, Port Arthur and Vancouver, there are several points, but more particularly in Nova Scotia, a considerable number of yards where the building of wooden vessels was being successfully and extensively carried on. In the Maritime Provinces this is a revival of an ancient industry, but it has also been undertaken in a practical manner at Vancouver, where many auxiliary schooners of a large size are being built for the timber trade between that province and Australia and the Orient. The Wallace Shipyards and J. Coughlan & Son, of Vancouver, have also recently concluded contracts for building several large steel freighters. A number of contracts for Norwegian interests have also been undertaken by Canadian companies, with the assistance of the Government, to supply the wastage by submarines and mines.

He reminded his hearers how the Canadian Government had been obliged, on account of the war, to prohibit the export of Canadian ships without the Government's consent. In order to provide for a large employment now and pave the way for permanent shipbuilding after the war, permission had been granted for the export of ships to be constructed as follows: J. Coughlan & Sons, Vancouver, 3 large steel freighters, with carrying capacity of more than 8,000 tons, at \$1,200,000 each; the Wallace Shipyards, of Vancouver, 4 large steel freighters; the Western Dry Dock Co., of Port Arthur, 3 full canal size steel freighters; Thor Iron Works, Toronto, 2 full canal size steel freighters; Polson Iron Works, Toronto, 2 steel freighters, 3,000 tons capacity, and 2 more of 4,250 tons; Canadian Vickers, Ltd., of Montreal, 2 steel freighters of 7,000 tons, and the Nova Scotia Steel Co., of New Glasgow, N.S., 3 freighters. One of the conditions on which permits were given to construct these vessels was that during the war they should not engage in any enemy trade, and another was that no demand should be made on Great Britain for materials, machinery or labor to build them.

"The immediate effect of the construction of these ships," said the Minister,

"will be the distribution of a large amount of money among the people, but the better and more enduring effect will come to us after the war is concluded, in the shape of a great industry established on a firm and permanent basis. If in this connection I have any note in the way of regret to sound, it is that our own people do not appear to engage in the profitable enterprise of building, owning and operating ships to as great an extent as in my judgment they should do."

He pointed out the immense amount of ocean shipping which will be needed after the war, when all the nations will engage in the race for world trade. The nation with the largest amount of available shipping will have a distinct advantage. That explains the anxiety of the Norwegians to get as many ships as possible, and it explains as well why there were built in United States yards in the first 10 months of the year vessels aggregating a tonnage of 405,894 tons. However, Great Britain had at the end of September 469 steel merchant ships, of a tonnage aggregating 1,789,054 tons, under construction and well advanced towards completion. Germany has done next to nothing since the commencement of the war, and Great Britain's supremacy is therefore, in no way menaced. That does not absolve Canadians, however, from doing their best to add to the mercantile marine of Canada to the fullest extent.

Mainly About Marine People.

Capt. Charles Babb, a well-known lake navigator, died at Goderich, Ont., Nov. 7.

Charles Smith, K.C., has been appointed Secretary, Quebec Harbor Commission.

W. G. Ross, Chairman, Montreal Harbor Commissioners, spent a short holiday at Pinehurst, North Carolina, during November.

Hiram Calvin, of the Calvin Co., Ltd., forwarders, etc., Kingston, Ont., and Mrs. and Miss Hilda Calvin, expect to leave for England shortly.

J. W. Norcross, Vice President and Managing Director, Canada Steamship Lines, Ltd., Montreal, has been elected a director of the Sterling Bank of Canada.

Capt. H. N. McMaster, heretofore Assistant to Marine Superintendent, Montreal Transportation Co., Kingston, Ont., has been appointed Marine Superintendent there, vice Capt. R. Fraser, retired.

Capt. Robert Fraser, Marine Superintendent, Montreal Transportation Co., Kingston, Ont., has resigned on account of ill health, and has gone to Long Beach, Cal., where he intends residing in the future.

R. L. Latham, Chief Engineer, Toronto, Hamilton & Buffalo Ry., has also been appointed Vice President, Toronto, Hamilton & Buffalo Navigation Co., in charge of maintenance. Office at Hamilton, Ont.

J. W. Norcross, Vice President and Managing Director, F. S. Isard, Comptroller, and C. A. Barnard, Director, Canada Steamship Lines, Ltd., returned to Canada about the middle of November, after a business trip to Europe.

Lt. Col. George Carruthers, son of James Carruthers, President, Canada Steamship Lines, Ltd., returned to Montreal recently from the front, where he was on service with the 5th Artillery Brigade. He is now raising a divisional ammunition column, with headquarters at Montreal.

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during October, 1916.

ARTICLES		CANADIAN CANAL	U. S. CANAL	TOTAL
Copper..... Eastbound	... Short tons		17,846	17,846
Grain .....	... Bushels	3,294,414	3,566,538	6,860,952
Building stone.....	... Short tons			
Flour .....	... Barrels	570,710	1,097,540	1,668,250
Iron ore.....	... Short tons	1,289,267	7,629,311	8,918,578
Pig iron.....			5,136	5,136
Lumber .....	... M. ft. b.m.	1,387	49,787	51,174
Wheat.....	... Bushels	9,475,885	8,968,948	18,444,833
General merchandise.....	... Short tons	2,541	56,468	59,009
Passengers .....	... Number	179	40	519
Coal, hard..... Westbound	... Short tons	7,000	272,350	279,350
Coal, soft		74,250	1,383,467	1,457,717
Flour .....	... Barrels		91	91
Grain .....	... Bushels		1,985	1,985
Manufactured iron.....	... Short tons	2,626	14,659	17,285
Iron ore.....	... Short tons			
Salt.....	... Barrels	3,500	107,128	110,628
General merchandise.....	... Short tons	50,854	143,533	194,387
Passengers .....	... Number	311	11	324
SUMMARY				
Vessel passages.....	Number	774	2,479	3,253
Registered tonnage.....	Net	1,480,741	7,915,223	9,395,964
Freight—Eastbound.....	Short tons	1,698,004	8,255,660	9,953,664
—Westbound.....		135,230	1,830,118	1,965,348
Total freight.....		1,833,234	10,085,778	11,919,012

Canadian Shipping Statistics.

The Deputy Minister of Marine, in his annual report for the financial year ended Mar. 31, states that the total number of vessels on the Canadian register at that date was 8,631, measuring 1,215,021 gross tons. In former years it was the custom to value the shipping at \$30 a net ton, and this figure, although an arbitrary one, having regard to averages, fairly represented approximate real values. At present values are abnormal and actual sales are common at prices ranging from \$75 a ton deadweight capacity, to \$100. The large number of British vessels withdrawn from commercial trade since the war commenced accounts almost altogether for the abnormal increase in freight rates and the consequent value of ships.

Throughout the year there has been much discussion in the press and by various public bodies as to the expediency of taking such steps as would ensure the early development of a purely Canadian mercantile marine, not only for the inland and coasting trade, but for foreign trade as well. In the development of any scheme that may be adopted for this purpose, it is to be hoped that, so far at least as foreign trade is concerned, it will be taken for granted that the day of the small carrier has gone by. It will be generally admitted that, conditions being normal, the construction of vessels for the foreign trade, of a gross tonnage of less than 3,000, should be discouraged, and it will be conceded that the most economical and therefore the most efficient vessel is one with a carrying capacity ranging from 7,000 to 10,000 tons.

The total tonnage transferred from the Canadian register during the period under review was 25,834, covering 42 vessels, divided as follows:

	Number.	Gross Tons.
United Kingdom	2	8,069
Newfoundland	12	4,338
Barbadoes	9	2,845
New Zealand	1	1,496
Shanghai	1	4,216
United States	14	4,780
Russia	1	

The number and tonnage of vessels according to provinces on the Canadian register for the year ended Dec. 31, 1915, was as follows:—

	Sailing vessels			Steamships		
	Number	Gross tons	Net tons	Number	Gross tons	Net tons
Ontario	609	114,209	107,090	1,502	331,087	205,881
Quebec	1,902	159,646	146,524	588	196,659	121,373
British Columbia	424	66,850	64,814	1,219	131,388	80,021
Nova Scotia	1,634	110,595	101,515	453	43,066	24,452
New Brunswick	811	36,021	34,896	257	33,283	21,323
Prince Edward Island	130	8,471	8,023	28	7,571	3,495
Manitoba	13	2,696	2,696	71	7,316	4,784
Yukon	1	556	556	10	2,715	1,739
Saskatchewan	1	145	145	4	660	385
Totals	4,625	491,428	465,859	4,132	753,745	463,453

Ports of registry are distributed as follows:—Ontario 38, Nova Scotia 21, New Brunswick 7, Quebec 6, British Columbia 4, Prince Edward Island, Manitoba, Saskatchewan and Yukon, 1 each.

New vessels built during the year, according to provinces:—

	Number.	Net Tons.
Quebec	49	7,790
Ontario	38	4,709
Nova Scotia	51	2,982
British Columbia	79	2,057
New Brunswick	22	1,114
Manitoba	5	156
Prince Edward Island	2	24
Totals	246	18,832

Of the 341 vessels removed from the register during the year, 14 were sold to foreigners (U.S.), 14 were wrecked, 21

stranded, 14 were lost, 215 broken up, reported out of existence, condemned, dismantled and abandoned, 1 abandoned at sea, 2 lost in collision, 7 foundered, 24 were burnt, 9 were transferred to Newfoundland, 6 to Barbadoes, 3 to Great Britain, 1 to New Zealand, and 1 to Turk's Island, 1 is posted as missing, 2 reported as registry no longer required, and 6 were sunk by Germans.

Stranding of the s.s. Kalibia.

An enquiry into the cause of the stranding of the Clyde Shipping Co.'s s.s. Kalibia, of Glasgow, Scotland, near Fox River, Gaspe County, on the south shore of the Gulf of St. Lawrence, Sept. 24, was held at Montreal, Oct. 5, before Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. C. Lapierre and F. Nash as nautical assessors. The court found that the master, John Stewart, was to a great extent misled through the disposition of two churches which were visible to him. Apparently there are three churches between Cape Rosier and the point where the vessel grounded, but the chart, which is an edition of 1890, gives the location of two churches only. This caused him to take cross bearing inaccurately. The vessel was running at full speed, which was maintained during fog, until the grounding, although the master had a doubt as to the accuracy of his bearings. He estimated the vessel to be about eight miles off land, and as his second observation did not coincide with his first, he went to the chart room to verify his position, leaving the vessel proceeding at full speed. The logs and records of observations were examined, and the court found that a method was observed throughout in conducting navigational functions and duties with regard to theory, and it stated with pleasure that it is seldom that observations and records are kept in such a methodical manner. Nevertheless, while credit is given the master for many things, that he has been in command for many years without an accident, serving only two firms, the court could not overlook the fact that the moment an element of doubt penetrated his mind, the only practical and careful way for him to have acted,

was to have stopped his vessel until he ascertained exactly the distance he was off land, and to have taken soundings which would have been a verification and would have freed him from any doubt. For failing to take a cast of the lead and for keeping his vessel full speed ahead, the court severely reprimanded him, but owing to his previous good record, did not deal with his certificate, although it cautioned him to act in a more prudent manner in future.

Regarding the officers, the court was not satisfied with the interest they displayed, and the knowledge of their responsibilities, but in view of the fact that the master seemed to guide the navigation of the vessel and was on the bridge,

they were not criticized, but were advised to become more interested in their duties, and instead of being on the bridge merely to obey orders, to recognize the fact that they can make themselves very useful to the master, if they study for themselves the existing conditions and assure themselves of the position of the vessel, referring to the chart, or taking observations if necessary, especially when banks of fog are seen in the distance, or more so when navigating in strange waters.

It was also pointed out that the vessel was navigated on a chart published in 1890, but as the master stated that he made enquiries from the authorities at Sydney for a chart of the St. Lawrence, and this was the only one obtainable, the court found no fault with him in that respect.

Atlantic and Pacific Ocean Marine.

We are officially advised that the name of the s.s. Hackness, which, as announced in our last issue, the C.P.R. has purchased from Pyman Bros., Wales, has been changed to Miniota.

The C.P.R. s.s. Lake Manitoba arrived in Montreal at the end of October, from Liverpool, for the first time since the outbreak of war, having been engaged in Admiralty work in the interval.

The s.s. Turret Cape, outward bound from Montreal for Manchester and Havre, with a cargo of steel, put in at St. John's, Nfld., Nov. 1, for slight engine repairs. She was detained a few days while they were carried out.

The British s.s. Seaton, which sailed from Montreal about the middle of October, and St. John's, Nfld., Oct. 20, is reported to have been sunk by the enemy. She was owned by the Seaton Steamship Co., West Hartlepool, Eng.

The Australian Government is stated to be operating about 35 cargo steamships, some of which have already been loaded at Montreal for Australian ports. In addition to these, five sailing vessels are being operated under Government control.

The s.s. Rappahannock, owned by Furness, Withy & Co., is reported to have been lost while en route from Halifax, N.S., to London, Eng., with a cargo of fruit and Red Cross supplies.

A number of Canadian survivors of the torpedoed s.s. Cabotia arrived at Quebec, Nov. 13, by the Allan Line s.s. Ionian. The Cabotia left Quebec, Oct. 10, with horses, and was torpedoed by a German submarine off the coast of Ireland, Oct. 20. Thirty out of a crew of 70 were saved.

The last sailings of ocean passenger vessels by the St. Lawrence route were announced to take place as follows: C.P.R. s.s. Metagama, Nov. 27; Allan Line s.s. Grampian, Nov. 25; Cunard Line s.s. Ausonia, Nov. 23; Anchor-Donaldson Line s.s. Athenia, Nov. 21; White Star-Dominion Line s.s. Northland, Nov. 19. Some cargo vessels will sail at later dates, as aids to navigation will not be removed until well into December, unless absolutely necessary.

All vessels are warned that they must not approach His Majesty's ships in Halifax harbor during the hours of darkness, within a distance of 200 yards, unless engaged on official business, when they must answer the challenge of the ship they are passing or proceeding to, otherwise they will lay themselves open to be fired upon. The Dartmouth Ferry Commission ferry boats are considered exempt from this order.

Maritime Provinces and Newfoundland.

A press dispatch states that the Nova Scotia Steel & Coal Co. has decided to build another steel steamship at its works at New Glasgow, N.S., about 25 per cent. larger than the one now under construction.

Mariners are warned that it may be necessary to extinguish certain lights and to discontinue or remove any aids to navigation on the east coast of Canada and on the coasts of Newfoundland without notice.

A Newfoundland press dispatch states that the French Government is negotiating with the Newfoundland Government, through the British Admiralty, for the release of the steamships *Portia* and *Prospero* from their local service, for use by the French Admiralty for war purposes.

Eastern Transport, Ltd., has been incorporated under the Nova Scotia Companies Act, with office at New Glasgow, N.S., to own and operate ferries between New Glasgow, Abercrombie, Pictou, Lyons Brook, Pictou Landing and Pictou Island. F. Fraser, S. M. Reltes and C. Ross, New Glasgow, are the incorporators.

Nova Scotia Shipping Co., Ltd., has been incorporated under the Nova Scotia Companies Act, with \$20,000 capital, and office at Halifax, to acquire the schooner *William Thomas Moore*, of Bridgetown, Barbados, and to own and operate steam and other vessels. W. J. Logan, H. C. DeWolf and B. H. Dunfield, Halifax, are the incorporators.

Publicover Shipping Co., Ltd., has been incorporated under the Nova Scotia Companies Act, with \$10,000 capital, and office at Liverpool, N.S., to acquire the schooner *James L. Publicover*, to own and operate steam and other vessels and to carry on a general fishing business. W. L. Hay, E. S. Marshall and S. M. Tartling, Liverpool, N.S., are the incorporators.

The Marine Department has issued a notice to mariners that *Sambro* lightship 15 has not been removed from her station at the *Sambro* outer bank near the Halifax harbor entrance, as erroneously stated in a previous notice. The sounding of the submarine bell from that lightship has been discontinued until further notice. The buoys which marked the war channel in the approach to Halifax, from *Neverfail* shoal to seaward, have been removed and discontinued.

Mariners are warned that the ports of Halifax, N.S., and St. John's, Nfld., are closed to all vessels from sunset to sunrise, until further notice. The narrows in the approach to St. John's are closed by a boom for the same period and a guard boat is in attendance. The following lights have been extinguished until further notice:—Cape St. Francis, Cape Spear, Bull Head, Ferryland, Bearcove Point, Fort Amherst and St. John's range lights, all in the neighborhood of St. John's harbor.

A New York press dispatch of Nov. 20, stated that the Canada Atlantic and Plant Line Steamship Co., which for many years has maintained a regular service between Halifax, Hawkesbury and Charlottetown, will discontinue its winter service at the end of the year, and may not resume sailings in the spring. It is also stated that officials admit that the steamships *Evangeline* and *Halifax* are for sale, a reserve price of \$600,000 being placed on the for-

mer. The s.s. *Halifax*, which was the only vessel on the route during the current year, will, it is said, undergo extensive repairs, unless sold.

The Department of Public Works received tenders to Dec. 1 for stone filling under the shed proposed to be built at pier 1, berth 16, West St. John, N.B.

The shipping companies operating at St. John, N.B., have increased the wages of the longshoremen to 37½c. an hour, as against the previous 35c., and a demand of the men for 40c. The new scale is effective at once and will continue in force until Dec. 1, 1919. The coal handlers demanded 55c. an hour and 65c. overtime, but have been granted an increase of 15c. an hour over the former rate, making the new rate 50c., and will work 10 hours a day instead of 9 as hitherto.

Province of Quebec Marine.

The Quebec Harbor Commissioners have purchased the s.s. *Juanita* in the United States, and have changed her name to *Courcelette*.

The Montreal, Valleyfield & Soulanges Navigation Co.'s s.s. *Hebron* was considerably damaged by fire at her moorings in the Lachine Canal, Montreal, Nov. 4. She is a small vessel and plied between Montreal and Cornwall.

Ontario and the Great Lakes.

The Farrar Transportation Co.'s s.s. *Collingwood*, which sustained some bottom damage when she grounded at Whitefish Point some time ago was repaired at Collingwood and resumed service Nov. 17.

Canada Steamship Lines' s.s. *Sir Trevor Dawson*, launched at Superior, Wis., recently, commenced her maiden trip, Nov. 20, when she loaded 11,000 tons of ore at the Missabe dock, and sailed for South Chicago.

The Imperial Oil Co.'s steamships *Iocolite*, *Royalite* and *Sarnolite* have been transferred from the Great Lakes to the Atlantic coast trade for the winter.

A pontoon lock gate lifter, built by M. Beatty & Sons, Ltd., Welland, passed from Lake Ontario by way of the Trent Valley Canal to Peterborough, Nov. 2. A description of this vessel was given in Canadian Railway and Marine World for Oct., 1914.

The Quebec & Levis Ferry Co.'s s.s. *John S. Thom*, which went aground near Waddington, above Cornwall, recently, and which was abandoned to the underwriters, is to remain there until the spring, on the recommendation of the local wrecking company.

The wreck of the barge *Rob Roy*, which was sunk some time ago in the Erie harbor approach, Lake Erie, is now no longer a menace to navigation. The upper works have been destroyed by storms, the mast and boom having been removed, and there is a least depth of 30 ft. over the wreck.

A resurvey of Penetanguishene harbor establishes the fact that the 300 ft. channel is in parts less than 20 ft. deep. During the past summer a channel with a least width of 100 ft. was completed with a least depth of 20 ft. In front of the esplanade a basin 500 ft. square with a tapered approach has the same depth.

The United States Lake Survey reports the levels of the Great Lakes in feet above mean sea level for October as follows:—Lake Superior, 603.72; Michigan

and Huron, 580.56; Erie, 571.90, and Ontario, 246.06. Compared with the average October levels for the past ten years. Superior was 1.12 ft. above, Michigan and Huron, 0.13 ft. above, Erie, 0.20 ft. below, and Ontario, 0.32 ft. above.

The Imperial Oil Co.'s s.s. *Imperial*, which was in collision with Canada Steamship Lines s.s. *Midland Prince*, Nov. 5, on Lake Superior, was taken into Sault Ste. Marie, whence she was taken in tow to Collingwood for overhaul and repairs.

The Rideau Canal has been closed for the winter and was emptied of water, Nov. 30. The tonnage passing through the canal this year was not so great as in 1915. Up to Oct. 31, there was a decrease in the vessel tonnage of 13,690 tons, as compared with the same period, 1915.

The s.s. *A. D. Davidson*, one of the steamships sold to the French Government recently by the Great Lakes & St. Lawrence Transportation Co., about which there was some litigation, is reported to have been lost at sea. She was considerably overdue, and one of her lifeboats has been washed ashore on the Cornish coast. She sailed from Montreal, Oct. 4, for Havre, France.

The steam tug *Thomas Freeland*, owned by J. Battle, Thorold, Ont., was destroyed by fire at the dock near lock 21, Welland Canal, Nov. 14. This tug, which was sunk in the Detroit River some time ago, was raised recently and repaired at Sarnia. She was built at Detroit, Mich., in 1888, and was formerly named *Fannie L. Baker*. Her dimensions were,—length 65 ft., breadth 16.5 ft., depth 6 ft.; tonnage, 54 gross, 33 register. She was equipped with engine of 10 n.h.p. driving a screw.

The Public Works Department has dredged the entrance to Port Hope harbor to a depth of 16 ft. below the zero of the gauge, which is 245 ft. above mean sea level. Beginning 200 ft. outside the breakwaters with a width of 175 ft., the dredging extends northward the full width between the breakwater piers to where the harbor widens and thence follows the east breakwater with a least width of 170 ft. to the channel between the east and central piers including the full width of that channel to a point 150 ft. inside the warehouse on the east pier.

The name of the s.s. *Caledonia*, which has been purchased from the Great Lakes Engineering Works, Detroit, Mich., by J. R. Smith, Fort William, has been changed to *Gale Staples*. She was built at Marine City, Mich., in 1888, and is of oak with diagonal strapping on the frames, with wooden boiler house, and was first named *W. B. Morley*. She is equipped with fore and aft compound engines with cylinders 24 and 44 in. diam. x 42 in. stroke, supplied with steam by two Scotch boilers, each 10 x 11 ft., at 130 lbs. under induced draught. The engines were made in 1883, and were removed from the s.s. *Kitty Forbes*. Her dimensions are,—length 227 ft., breadth 42 ft., depth 21 ft.; tonnage, 2,197 gross, 1,509 register.

The Reid Wrecking Co., Sarnia, is reported to have purchased the s.s. *Kongo* from the U.S. owners, and it is stated that she will be transferred to the Canadian register. She was built at West Bay City, Mich., in 1881, and is of oak, of the well deck type, with diagonal strapping on the frames, steel arches, wooden boiler house, and was formerly named *Meriden*. She was overhauled and large repairs undertaken in 1911. The propelling machinery consists of compound engines with cylinders 20 and 36 in. diam. by 30 in.

stroke, 450 i.h.p. at 100 r.p.m. and supplied with steam by a Scotch boiler 11 ft. 2 in. by 11 ft. 3 in., at 125 lbs. Her dimensions are,—length 215 ft., breadth 31 ft., depth 10 ft. 2 in.; tonnage, 672 gross, 482 register.

The steamship Algonquin and the motor ship Fordonia, are reported to have been sold to United States interests. The s.s. Algonquin was originally built for Thos. Marks & Co., Port Arthur, Ont., and then sold to the St. Lawrence & Chicago Steam Navigation Co., and was about three years ago sold to the Port Colborne and St. Lawrence Navigation Co., a subsidiary of the Maple Leaf Milling Co. She was again sold last year to A. B. McKay, who had her overhauled and then sold her to the Wasis Steamship Co., a subsidiary of the Nova Scotia Steel & Coal Co. The motor ship Fordonian was originally built for the Merchants Mutual Line Ltd., and later passed to Canada Steamship Lines Ltd. During the summer season she was operated under charter by the Quebec Steamship Co., a subsidiary of Canada Steamship Lines Ltd.

Manitoba, Saskatchewan and Alberta.

Navigation on the Athabasca River has been closed for the winter on account of ice conditions. One vessel ran about 16 miles up the river from Athabasca, Nov. 7, but had to return. The Athabasca ferry has been laid up for the winter.

Supplementary letters patent have been issued under the Dominion Companies Act, changing the name of the Winnipeg Steamship Co., Ltd., to Woodward & Co., Ltd., and cancelling the powers granted to the original company and substituting others. The new company has power to own and operate grain elevators, but has no power to own and operate steam or other vessels, as was granted in the original charter.

British Columbia and Pacific Coast.

The C.P.R. s.s. Princess Charlotte, which has been operating on the triangular service during the summer, has been withdrawn from service and laid up for the winter at Victoria. This service is being maintained by the s.s. Princess Adelaide and Princess Victoria.

The C.P.R. s.s. Princess Alice arrived at Vancouver, Nov. 6, after completing her last round trip to Alaska for the season. She is to be operated in the Gulf service for the winter. The s.s. Princess Sophia will be the only C.P.R. vessel running to Alaska during the winter on a fortnightly service to Skagway.

The Canadian Northern Ry. is operating its first car ferry barge between Port Mann and Gulf points. A second barge will be placed in service between Port Mann and Patricia Bay as soon as the dock at Patricia Bay is completed. Each of these barges has capacity for 9 cars. It is stated that a third barge is being built with capacity for 12 cars.

The Pacific Steamship Co., formed recently to take over the Pacific Coast Steamship Co. and the Pacific Alaska Navigation Co., has decided to maintain the steamships Governor and President on the service to Victoria and Vancouver, instead of replacing them with the steamships Queen and Umatilla, smaller and slower vessels.

The David Evans Shipping Co., Ltd. has been incorporated under the Dominion Companies Act, with \$25,000 authorized capital, and office at Vancouver, B.C.,

to own, manage and operate steam and other vessels, etc., and to carry on a general transportation and navigation business. T. W. B. London, M. H. Thorburn, W. B. Johnson, J. H. Lawson and R. W. Ginn, Vancouver, are the incorporators.

A company is reported to be in process of organization in Prince Rupert to build fishing vessels, three of which are to be taken in hand almost immediately. One of these will be 54 ft. long, equipped with engine of 50 h.p., one will be 44 ft. long, equipped with engine of 30 h.p., and the third will be a seine vessel. C. E. Bainter, an insurance broker, is stated to be actively interested in the scheme.

Transfer of Canadian Vessels Restricted.

The Dominion Government has issued the following regulations respecting the transfer of Canadian vessels to a foreign register:—The regulations enacted by order in council, Mar. 9, 1915, are extended to apply to mortgages of ships, including transfer of mortgages made after Aug. 10, 1916, as they apply to the transfer of ships, and shall apply to mortgages, including to transfers of mortgages, and transfers of ships to foreign controlled companies, made after Aug. 10, 1916, as it applies to transfers of ships to persons not qualified to own a British ship.

The expression "foreign controlled company" means any corporation where the majority of directors or persons occupying the positions of directors, by whatever name called, are not British subjects; where the majority of the voting power is in the hands of persons who are not British subjects, or who exercise their voting powers directly or indirectly on behalf of persons who are not British subjects; where the control is by any other means whatever in the hands of persons who are not British subjects; or where the executive is a foreign controlled company, or where the majority of the executive are appointed by a foreign controlled company.

A corporation shall not be deemed a British subject for the purposes of this section unless it is established in and subject to the laws of some part of His Majesty's Dominions, or of some British Protectorate, and has its principal place of business therein.

The Minister of Marine may require any person who is the owner or mortgagee of a British ship, or who applies to be registered as such, to furnish him with such particulars as may appear necessary to him for the purpose of ascertaining whether or not that person is, or is a trustee for, or otherwise represents a foreigner, or foreign controlled company, and in case of a corporation may require the secretary, or any other officer performing the duties of secretary, to furnish those particulars, and if any person fails to supply such particulars as it is in his power to give when required, or furnishes particulars which are false in any material particular, he shall be guilty of a misdemeanor.

After the passing of these regulations, where any person who is the owner or mortgagee of a British ship ceases to be a British subject, or becomes a foreign controlled company, that ship, or in case of a mortgagee of a ship, the interest of the mortgage, shall be subject to forfeiture, and the provisions of the Merchant Shipping Act relating to the forfeiture of ships shall apply thereto.

These regulations are declared to be in

force for the duration of the war and for three years thereafter.

Rumors About Government Shipping.

A press report from Montreal states that a well founded rumor in shipping circles has it that the initial step towards a Dominion owned mercantile fleet has been taken by the Government, which, according to the rumor, has granted aid to a recently formed shipbuilding company to build nine big freight carriers at a total cost of \$4,000,000. It is stated that these vessels are to be built for shipping Canadian lumber from the Pacific Coast, that plans and specifications of a U.S. vessel have been adopted, and that the Government has subsidized the Brown Auxiliary Lumber Vessel Co., which has a capital of \$5,000,000, to build nine vessels of this type. So far as can be ascertained, there is no truth in the statements as quoted, or at best it is a garbled version of information already published by Canadian Railway and Marine World. Canada West Coast Navigation Co., Ltd., has been incorporated in British Columbia, by a number of men associated with shipping in the east, and chiefly connected with Canada Steamship Lines, Ltd., together with H. W. Brown, who is General Manager of the company, and who was formerly connected with the Pittsburg Steamship Co. This new company has placed contracts for the construction of eight vessels of the bald headed schooner type, equipped with semi Diesel engines, designed by J. H. Price, St. Helens, Ore., who designed the ship City of Portland, specially mentioned in the rumor above quoted. These vessels are being built as a direct result of the British Columbia Shipping Act, which provides for the granting of aid under certain conditions, and there is no suggestion of any Dominion subsidy, except any allowances or customs drawback, which may come under the recently passed order in council, details of which are given on another page in this issue.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Dominion Wire Rope Co., Ltd., Montreal, has opened an office at 108 Mail Building, Toronto.

F. H. Hopkins & Co., railway and contractors' supplies, Montreal, have opened an office at 108 Mail Building, Toronto.

Dominion Iron & Steel Co.—J. P. McNaughton, General Sales Manager, has removed his headquarters from Sydney, N.S., to 112 St. James St., Montreal.

Foundry Products, Ltd., has been established in Calgary, Alta., to do a jobbing business in railway, general contractors, mine, heating and plumbing supplies, etc.

Dougall Varnish Co., Ltd.—W. R. Notman, Western Representative at Winnipeg, who was a lieutenant in charge of a machine gun section in one of the Winnipeg battalions, C.E.F., was killed in action, Oct. 25.

Canadian Steel Foundries Limited.—F. E. Smith, heretofore General Superintendent, has been appointed Operating Manager.

Canadian Car & Foundry Co. Ltd.—W. W. Butler, heretofore senior Vice President, has been elected Vice President and Managing Director. F. A. Skelton, heretofore Secretary-Treasurer, has been elected a vice president. W. S. Atwood, heretofore Chief Engineer and General Works Manager, has been appointed Operating Manager.

Canadian Westinghouse Co. has issued the following illustrated bulletins: Westinghouse 101-K railway motor, 30 kw., 40 h.p., 600 volt, split frame, for handling heavy loads at slow speed without a heavy draft of current on the power house or substation equipment; Westinghouse 323-V railway motor, 30 kw., 40 h.p., 600 volt, split frame commutating pole motor 25 kw., 33 h.p., 500 volts; and Westinghouse drum type controllers for electric railway service.

International Correspondence Schools, Scranton, Pa., has issued a "Manual of Information for Students" which is given to each student as he enrolls and before he is given any instruction papers. Its principal contents are introductory remarks, instruction papers and supplies, suggestions for correspondence, method of procedure, postal information, suggestions for study, important requirements for successful study, aid to students. It is very completely indexed.

Goldschmidt Thermit Co.—Wm. C. Cuntz, General Manager and a Director of the Goldschmidt Thermit Co., New York and Toronto, died Nov. 2, at Auburndale, Mass., where he was on a visit for the benefit of his health, which was impaired by an operation for appendicitis a year ago. He was born at Hoboken, N.J., in 1871, and was educated at Hoboken Academy and Stevens Institute of Technology, graduating from the latter in 1892, with the degree of mechanical engineer. He became connected with the Pennsylvania Steel Co., first with the bridge and construction department, which he represented as resident engineer in Boston, Mass., and as European resident engineer in London, Eng. He then served as Assistant General Manager of Sales in Philadelphia, and later as District Sales Manager at Steelton, Pa. In 1910 he was appointed by President Taft as a delegate to the International Railway Congress at Berne, Switzerland. In the same year he severed his connection with the Pennsylvania Steel Co. to become a director and General Manager of the Goldschmidt Thermit Co. in New York. Under his management the business of this company increased very greatly, and equal progress has been

made in the technical development of the Thermit process. His wide experience in the steel industry naturally caused him to take a particular interest in the manufacture of carbon-free metals, and it is largely due to his perseverance and initiative that these metals and alloys are coming into such general use. He was a member of the American Society of Civil Engineers and of some 20 other societies and clubs.

Chilled Iron Car Wheels.

At the Association of Manufacturers of Chilled Car Wheels' annual meeting in New York recently, G. W. Lyndon was re-elected President-Treasurer; J. A. Kilpatrick, President Albany Car Wheel Co., Albany, N.Y., was elected one of the vice presidents, and W. S. Atwood, Chief Engineer, Canadian Car and Foundry Co., Montreal, was elected a director. Following are extracts from the President's address:

The work of our Association during the past year has been based upon the recommendations made to the Master Car Builders Wheel Committee during 1914, at which time we not only outlined a plan of procedure for the improvement of the chilled iron car wheel, by which the safety element stood out prominently, but accompanied our recommendation with full data, pointing out the weaknesses of the present Master Car Builders' standards, and gave our reasons for recommended changes, based upon the knowledge acquired from service records and the lifelong experience of the manufacturers and service of the chilled iron wheel. Our recommendations were substantially as follows: (1) An increase in the weights of the 625 and 725 lb. M.C.B. (2) An 850 lb. wheel for cars of 140,000 lb. capacity; (3) A flange for the 850-lb. wheel for use under the 70-ton cars, with as much of an increase as would be acceptable to the American Railway Engineering Association.

Since our organization in 1909, we have steadfastly maintained that the varied service in the 60,000 lb. class of cars made it imperative that the weight of the wheel should either be increased to meet the maximum conditions of service, or that we should have two standards in this class. The variation in service arises from the variations in the light weight of the car in the 60,000 lb. capacity class, and as the standard of operation is to brake the cars 60% of their light weight, it must follow that any class of cars in which there is 100% variation in light weight (which is common in the 60,000 lb. class) cannot with safety carry the

same weight of wheel, and this is what the manufacturers have been required to do. The standard wheel specified for the 60,000 lb. class weighs 625 lb. and the light weights of the cars vary from 20,000 to 53,999 lb. Our Association recommended that the weight of the wheel be increased to 675 lbs, which would provide a standard wheel which would meet the maximum conditions of service as to load and brake, and in asking for an increase in weight of the two standards 625 and 725 M. C. B. wheels, we were not actuated by commercial considerations, but purely from the standpoint of safety. It is estimated that there are 2,500,000 chilled iron wheel renewals annually and if the weights should be increased 50 lb. each the additional metal to be purchased would approximate 62,500 tons, providing all the renewals required an increase, which is by no means the case, because many of the prominent railways in the country, representing over a fourth of all the cars in use, are already introducing advanced standards and are using wheels much heavier than the present M. C. B. standards. The heaviest 725 lb. M. C. B. standard chilled iron wheel for 50-ton cars is lighter than the rolled steel wheel, and there is no good reason why the chilled iron wheel should be so limited in weight, particularly when the increase involves the nominal expenditure of \$10 a ton, which is the difference between the scrap value of the old wheel, which is accepted in part payment for the new. The reduction in accident hazards would more than absorb the increased expense due to the nominal increase in weight.

Ever since the introduction of the 50-ton car, our association has recommended an increase in the metal of the flange at the gauging point. The American Railway Engineering Association has reported that the manufacturers could increase this flange width 3-16 in. without any change in the present flangeways of track. The M. C. B. Wheel Committee has reported in Convention "that there be no changes in the dimensions and contour of flanges of car wheels as adopted in 1909." The flange adopted in 1909 was an improvement over the M. C. B. design and through the recommendation of our association we succeeded in reducing its height from $\frac{1}{2}$ in. to 1 inch, which gave it greater strength. We know that we can make further improvements, and it needs no argument to prove that a stronger flange is required for the 70-ton cars than for the 30-ton cars.

Our association has made a very satisfactory arrangement with the University of Illinois, in which it is agreed: "That the University Experiment Station will undertake an investigation concerning the stresses and behavior of chilled iron car wheels." In submitting a draft of this arrangement to the President of the University of Illinois, Dean Goss made the following statement: "Progress in the art of railroading is continually developing new questions affecting the weight and contour of chilled iron car wheels. The importance of securing proper design and proper methods of manufacture for such wheels may be judged by the fact that there are now in operation in the U. S. approximately 20,000,000 freight car wheels, and the demand for renewals alone involves the manufacture of 2,500,000 chilled iron car wheels per year. With these facts in mind, the As-

Complete Hydraulic Equipment

For Railway and Shipbuilding Plants

Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc. Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast Iron Pipe, Hydrants, Valves and Fittings, etc.

R. D. WOOD & CO. Philadelphia, Pa.

sociation of Manufacturers of Chilled Iron Wheels has agreed to co-operate with the Engineering Experiment Station in a study of the questions fundamental to the design of such wheel. The co-operation proposed guarantees to the station the strongest possible assistance in the development of an investigation of great importance to the public weal."

All of the work of our association is constructive and our recommendations are based upon solid grounds, which must receive favorable consideration and while we have not as yet secured all the improvements outlined, we feel sure that we have demonstrated the reasonableness of our claims. The chilled iron wheel remains in the forefront, not only in this country but in Europe, where the old European standards are seriously menaced. No other type of wheel has ever made serious inroads on the chilled iron wheel and never will providing we are all alive to the increased demands of service. For two-thirds of a century the chilled iron car wheel has remained the standard for the nation's commerce.

Transportation Conventions in 1916-1917.

Dec. 5-7.—Railway Gardening Association, New Orleans, La.

Dec. 5-8.—American Society of Mechanical Engineers, New York, N.Y.

Dec. 12-13.—Association of Transportation and Car Accounting Officers, Atlanta, Ga.

1917.

January.—American Association of Demurrage Officers, New York, N.Y.

Jan. 16.—Railway Business Association, New York, N.Y.

Jan. 23-25.—American Wood Preservers Association, New York, N.Y.

Mar. 20-22.—American Railway Engineering Association, Chicago, Ill.

May.—Association of Railway Claim Agents, Louisville, Ky.

May 9-11.—Railway Development Association, Louisville, Ky.

May 14-17.—International Railway Fuel Association, Chicago, Ill.

May 30.—Association of American Railway Accounting Officers, Richmond, Va.

June.—American Association of Freight Agents, Denver, Col.

June.—American Railway Master Mechanics Association.

June.—Master Car Builders Association.

June 19.—Freight Claims Association, Banff, Alta.

August.—International Railroad Master Blacksmith's Association, Chicago, Ill.

September.—Railway Signal Association, Atlantic City, N.J.

Sept. 11.—Master Car and Locomotive Painters Association of the United States and Canada, Chicago, Ill.

Sept. 18-20.—Association of Railway Telegraph Superintendents, Washington, D.C.

Sept. 18-21.—Roadmasters and Maintenance of Way Association, Chicago, Ill.

October.—American Association of Dining Car Superintendents, San Francisco, Cal.

October.—Railway Real Estate Association, Duluth, Minn.

Oct. 16-18.—American Railway Bridge and Building Association, St. Paul, Minn.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated:

Canadian Car Service Bureau—W. J. Collins, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association—Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern lines)—G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western lines)—W. E. Campbell, 806 Boyd Block, Winnipeg.

Canadian Railway Club—J. Powell, St. Lambert, Que. Meetings at Montreal 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers—C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Associations—E. de la Hooke, London, Ont.



WIRES and CABLES for STEAM and ELECTRIC RAILWAYS



THE fact that most of the steam and electric railroads in this country are using our products and continue from year to year to send in their repeat orders, is the best indication of what users think of Northern Electric quality.

No manufacturer pays more painstaking attention to the wire and cable requirements of the railroads; and the manufacturing and shipping facilities of our new Montreal plant are unsurpassed.

Here are some of the lines we make:—

Railway Signal Wire, bare and rubber covered.

Rubber-Covered Wire for round houses and repair shops.

Asbestos Insulated Wire for Headlights.

Reinforced Weatherproof Cables and Armored Cables for use in car shops.

Magnet Wire for rewinding motors.

Car Wire for electric light, fan, annunciator, motor and control circuits.

Trolley Wire.

Bare Weatherproof and Paper Insulated Feeder Cables.

Bonding Cables.

Paper-insulated, Lead-covered Telephone Cables and Bare Wires for Train Dispatching.

Paper-insulated and Rubber-insulated Telegraph Cables.

Armored Cables for bridge installations.



Northern Electric Company
LIMITED

MONTREAL HALIFAX TORONTO WINNIPEG
REGINA CALGARY VANCOUVER

Dominion Marine Association—F. King, Counsel, Kingston, Ont.
 Eastern Canadian Passenger Association—G. H. Webster, 54 Beaver Hall Hill, Montreal.
 Engineers' Club of Montreal—R. W. H. Smith, 9 Beaver Hall Square, Montreal.
 Engineers' Club of Toronto—R. B. Wolsey, 94 King Street West, Toronto.
 Express Traffic Association of Canada—W. H. Burr, Chairman, Toronto.
 Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.
 Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.
 International Water Lines Passenger Association—M. R. Nelson, New York.
 Niagara Frontier Summer Rate Committee—James Morrison, Montreal.
 Nova Scotia Society of Engineers—A. R. McCleave, Halifax, N.S.
 Quebec Transportation Club—A. F. Dion, Quebec.
 Shipping Federation of Canada—Thos. Robb, Manager, 42 St. Sacramento Street, Montreal.
 Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.
 Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.
 Transportation Club of Vancouver—H. W. Schofield, 553 Granville St., Vancouver, B.C.
 Twin Cities Local Freight Agents' Association—E. J. Travers, Fort William, Ont.
 Western Canada Railway Club—Louis Kon, Box 1707 Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.
 Winnipeg Traffic Club—James Gehrey, Bannatyne Avenue, Winnipeg, Man.

CANADIAN PACIFIC RAILWAY CO.

Dividend Notice.

At a meeting of the Board of Directors held today a dividend of two and one-half per cent. on the Common Stock for the quarter ended 30th September last, being at the rate of seven per cent. per annum from revenue and three per cent. per annum from Special Income Account, was declared payable on 2nd January next, to Shareholders of record at 3 p.m. on 1st December next.

By order of the Board,
 W. R. BAKER,
 Secretary.

Montreal, 13th November, 1916.

HULL OF LAUNCH FOR SALE.—

Hull of Government launch at Sturgeon Falls, Ont. Address tenders for same, accompanied by \$10.00 accepted bank cheque, to R. C. Desrochers, Secretary, Public Works Department, Ottawa.

THE VICTORIA ROLLING STOCK & REALTY CO., OF ONTARIO, LIMITED.

Notice is hereby given that a dividend of four per cent. on the paid-up capital stock of the Company for the half-year ended Nov. 30th, 1916, has been declared payable Dec. 1st, 1916, to the shareholders on record as of the 30th of Nov., 1916.

By order of the Board.
 G. T. CHISHOLM, Secretary.
 Toronto, Nov. 20th, 1916.

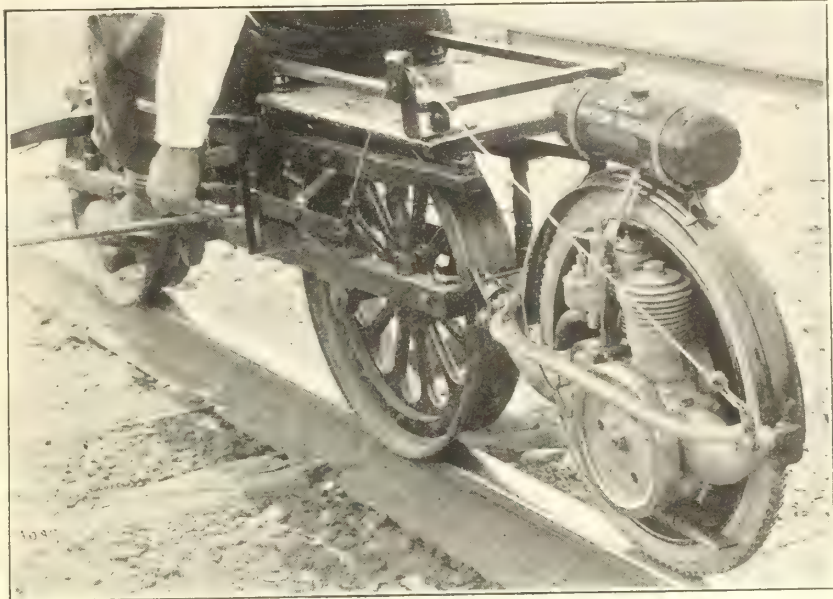
NOTICE.

The General Railway Signal Company of the United States of America, the owner of the exclusive rights to Canadian patents No. 92323, No. 93127, No. 96256, and No. 97758, issued to Young and Townsend, and covering methods of signaling electrified railways, wishes to call the attention of all possible users of the devices and systems covered by such patents to the facts that it is prepared to sell and furnish, at short notice, all such devices and to install such systems upon any railway in the Dominion of Canada.
 All inquiries regarding the above should be addressed to The General Railway Signal Company of Canada, Limited, Lachine, Province of Quebec, Canada.

GRIFFIN & BRINKERHOFF

P.O. Box 97, Windsor, Ont.

Canadian manufacturers of the Celebrated Wheel Truing Brake Shoe. Best Wheel Grinders in the World.



Let the Smith Motor Wheel Pump Your Speeder

Fastened on the rear of your car, it will give you a speed from 4 up to 20 miles per hour.

75 to 100 miles on a gallon of gasoline is regular every day service for this powerful little machine.

A flexible tube containing a strong wire extends from the motor to the handle bars giving absolute control at all times.

Sold at a reasonable price on monthly payment basis. Write for terms.

The Canadian Fairbanks-Morse Co., Limited

ST. JOHN, QUEBEC, MONTREAL, OTTAWA,
 TORONTO, WINDSOR, HAMILTON, WINNIPEG,
 SASKATOON, CALGARY, VANCOUVER,
 VICTORIA



Non-Sweating Railway Lamps

We manufacture
 SWITCH MARKER, CLASSIFICATION SEMAPHORE
 to R. S. A. Specification.

The Hiram L. Piper Company, Limited, Montreal

Our No. 31 Catalogue illustrates them all.

CANADIAN BRONZE LIMITED

Brass Wearing Parts for Locomotives. Journal Bearings for Freight and Passenger Service. BABBITTS. Miscellaneous Brass Castings for Railroads.

Works and Office: 69 Delorimier Avenue, MONTREAL, QUE.

Western Dry Dock and Shipbuilding Company, Limited

ANNOUNCEMENT

The plant of the Western Dry Dock and Shipbuilding Co., Limited, Port Arthur, Ont., which has hitherto been controlled by United States interests, has been purchased by James Whalen, Port Arthur, Ont., and John Burnham, Chicago, Ill., and will in future be operated under the direct management of the former.

It is the most modern and best equipped shipbuilding plant on the Great Lakes, including a solid concrete dry dock over 700 ft. long. Though only established a few years it has achieved signal success in the construction of lake vessels of the most modern type.

Additional berths are being installed to allow of the construction of four vessels at one time, and a permanent organization will be maintained at all times for vessel building, and also for building on owners' account should necessity arise.

BUILDERS OF THE

s.s. NORONIC

The finest passenger steamship and the
on the Great Lakes.

s.s. W. GRANT MORDEN

The largest bulk freighter in the
world.

Your Cars Demand the Best

When contracting for new cars, or repairing those in use, it will pay you to investigate the merits, and place a trial order for



REG. U. S. PAT. OFF.

It is made to stand hard service, and is neat and attractive. Years of experimentation have resulted in giving Railroad Men a material which is a most satisfactory and serviceable covering for car seats.

TRY FABRIKOID — IT PAYS.

Du Pont Fabrikoid Company

Canadian Factory, Toronto, Canada

Du Pont Building, Wilmington, Del.

Wendell & MacDuffie Co., Railroad Department Representatives, 61 Broadway, New York



"This cellar will be dry"

THERE will be no trouble here from dampness getting into this cellar wall. I am applying a coating that will keep it as tight as a drum. It is the best material I know of, and it is called—



**MARINE
CEMENT**

R. I. W. Marine Cement is applied from footings to grade level of brick, stone and concrete foundation walls. Very successfully used on the McKinley Memorial Monument at Canton, Ohio.

When wood flooring is to be laid over masonry concrete the sleepers and under side of the flooring should be coated with R. I. W. Trimbak, followed by R. I. W. Marine Cement over the concrete and sleepers before the flooring is laid.

Applied cold with a brush or swab.

Write for a copy of the Red Book from Dept. 56.

Manufactured in Canada by

**R. I. W. DAMP-RESISTING PAINT CO.
TOCH BROTHERS**

Gerrard St. and Carlaw Ave.
TORONTO, ONTARIO, CANADA

ESTABLISHED 1849.

BRADSTREET'S

Capital and Surplus, \$1,500,000.
Offices throughout the Civilized World.

Executive Offices:
NOS. 343 and 348 BROADWAY,
N.Y. CITY, U.S.A.

The Bradstreet Company gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchants, by the merchants, for the merchants. In procuring, verifying, and promulgating information, no effort is spared, and no reasonable expense considered too great that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished and are available only by reputable wholesale jobbing, and manufacturing concerns, and by responsible and worthy financial, fiduciary, and business corporations. Specific terms may be obtained by addressing the Company at any of its offices. Correspondence invited.

OFFICES IN CANADA:

Halifax, N.S.; Hamilton, Ont.; London, Ont.;
Montreal, Que.; Ottawa, Ont.; Quebec, Que.;
St. John, N.B.; Toronto, Ont.; Vancouver, B.C.;
Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man.;
Victoria, B.C.

THOS. C. IRVING,

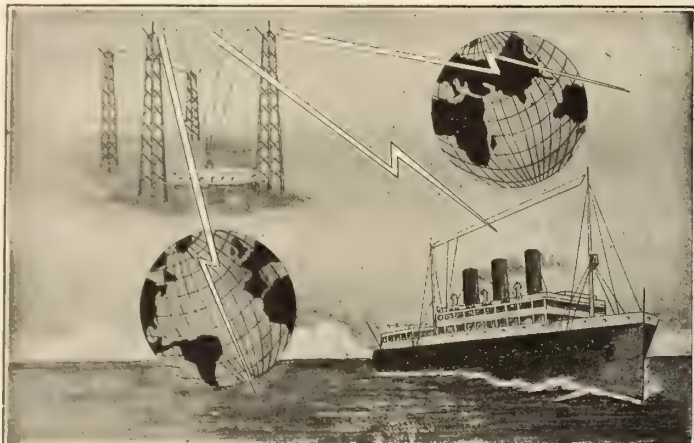
Gen. Man. Western Canada, Toronto.

**FOR TICKET CASES AND
COMMERCIAL FURNITURE**

of all descriptions to stock
or special design, apply to

The Canadian Office and School Furniture Co.,
Limited
Preston - Ontario

"Marconi" Wireless Telegraph Apparatus



THE WORLD WIDE WIRELESS

We supply installations on Land, Ship, Railway and Aeroplane. Sets range from 50 to 2,000 miles.

Demonstrated

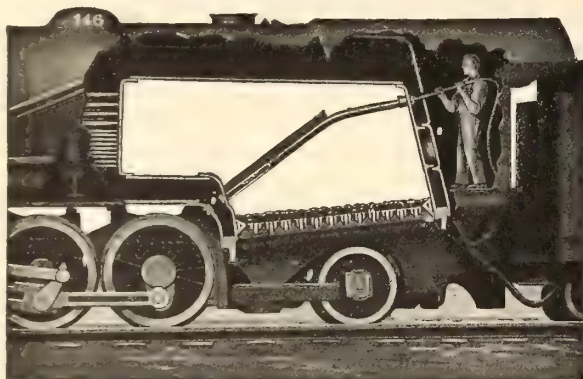
That Merchant and Pleasure Craft cannot afford to be without a MARCONI EQUIPMENT. Every passenger steamer worth the name is now equipped with Marconi Wireless. Over 2,000 vessels now equipped.

Canadian Marconi Company

137 McGill Street, MONTREAL



Lagonda Arch Tube Cleaner.



Lagonda Cleaner Removing Scale from Arch Tubes.

Lagonda Arch Tube Cleaners

Scale forms in the Water Arch Tubes of Locomotives, and it must be removed, as Government Inspection requires that these tubes be absolutely clean.

The Lagonda Arch Tube Cleaner will remove these scale deposits easily and quickly. They are built for all sizes of tubes and can be driven by either water, air or steam. Send for Catalogue W-1 describing the construction and operation of these Cleaners.

Other Lagonda Boiler Room Specialties are described in our General Catalogue L. Send for Copy.

Babcock and Wilcox, Limited

Head Office for Canada
St. Henry, MONTREAL

Toronto Office
Traders Bank Building

Portable Cylinders of Various Capacities for

Oxy-Acetylene Welding and Cutting

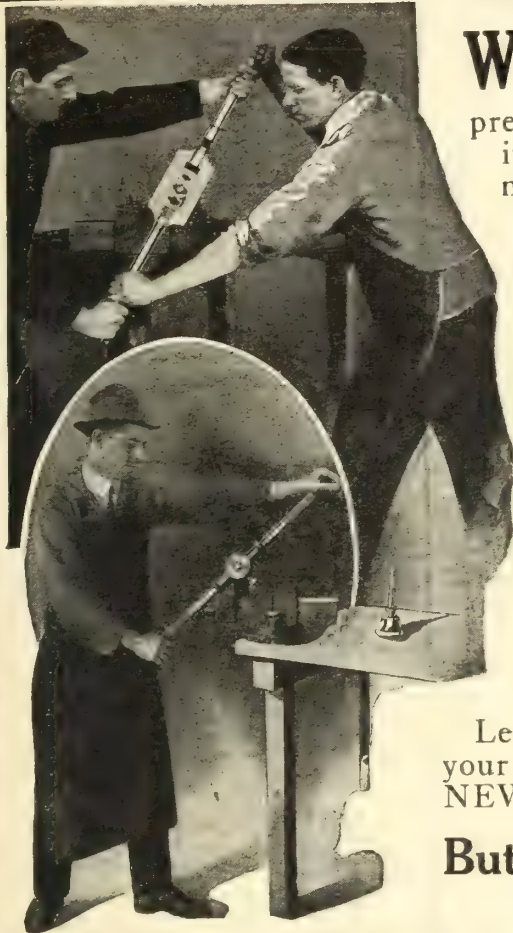
"The use of Commercial Acetylene insures the best possible results. It is Dry and Free from Impurities. That Counts."

Commercial Acetylene Welding Co., Inc.

103 Bay Street, Toronto

Main Office, 80 Broadway, New York

Branches, Atlanta, Boston, Chicago, San Francisco



Which Method

prevails in your plant? Does it take two men to do one man's work.

Why don't you replace that old antiquated tool with a new up to date

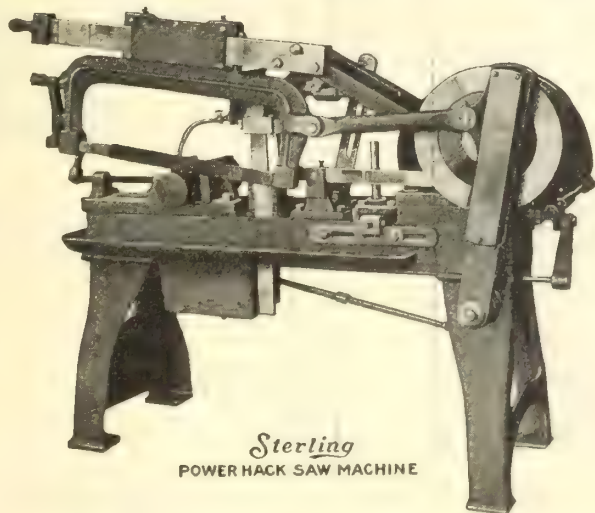
Reece's New Screw Plate

These pictures do not exaggerate conditions as you can actually see them, if you will visit Machine Shops throughout the country.

Lessen your cost by giving your mechanics a REECE'S NEW SCREW PLATE.

Butterfield & Co., Inc.
Rock Island, Que,

"STERLING" High Duty Power Hack Saw Machine



Sterling
POWER HACK SAW MACHINE

Cuts round material up to and including 6 in.

Manufactured by

Diamond Saw & Stamping Works,
Buffalo, N.Y., U.S.A.

INTERNATIONAL CORRESPONDENCE SCHOOLS
Box 8411, SCRANTON, PA.

Pass *The Undersigned*

to a full understanding of how he (or she) can qualify for advancement and success in the position before which is marked X.

- | | |
|---|---|
| <input type="checkbox"/> Locomotive Engineer | <input type="checkbox"/> Surveying and Mapping |
| <input type="checkbox"/> Locomotive Fireman | <input type="checkbox"/> R. R. Constructing |
| <input type="checkbox"/> Travelling Engineer | <input type="checkbox"/> Bridge Engineer |
| <input type="checkbox"/> Travelling Fireman | <input type="checkbox"/> Architect |
| <input type="checkbox"/> Air Brake Inspector | <input type="checkbox"/> R. R. Agency Accounting |
| <input type="checkbox"/> Air Brake Repairman | <input type="checkbox"/> R.R. Genl. Office Acct'g |
| <input type="checkbox"/> Round House Foreman | <input type="checkbox"/> Bookkeeper |
| <input type="checkbox"/> Trainmen and Carmen | <input type="checkbox"/> Stenographer and Typist |
| <input type="checkbox"/> Railway Conductor | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> Mechanical Engineer | <input type="checkbox"/> Advertising Man |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> Civil Service |
| <input type="checkbox"/> Machine Shop Practise | <input type="checkbox"/> Electrical Engineer |
| <input type="checkbox"/> Boiler Maker or Designer | <input type="checkbox"/> Telegraph Expert |
| <input type="checkbox"/> Steam Engineer | <input type="checkbox"/> Practical Telephony |
| <input type="checkbox"/> Steam-Electric Engineer | <input type="checkbox"/> Chemist |
| <input type="checkbox"/> Civil Engineer | <input type="checkbox"/> Automobiles |

Name _____

Occupation & Employer _____

Street and No. _____

City _____ State _____

"Here's Your Pass!"

Have you ever stopped to consider what this coupon may be worth to you? It is the offer of the largest educational institution in the world, having 25 years' experience in qualifying hundreds of thousands of people for better positions, to help YOU to obtain the advancement and promotion that you want and should have.

If YOU really want to better yourself, the International Correspondence Schools can help you, no matter how poor your circumstances, nor what your age, nor how scant your education may be. No time lost from your present work. No books to buy. Pay on terms you can afford. If you realize the worth of this coupon, mark it and mail it to the Schools. It puts you under no obligation. It is simply a free way to *find out* how to make a success of your life.

USE YOUR PASS NOW

Hunt-Spiller Gun Iron

IN

Locomotive Castings

SAVES MONEY

INCREASES: Engine Efficiency—Engine Mileage.

DECREASES: Engine Failures—Engine Repairs.

MADE ONLY BY

Hunt-Spiller Mfg. Corporation

W. B. LEACH, President and General Manager.

Office and Works,
383 Dorchester Avenue,
So. Boston, Mass.

J. G. Platt,
Sales Manager.

Canadian Representative,
Canuck Supply Company, Limited,
392 St. James St., Montreal, P.Q.

ENAMELED IRON SIGNS

The ideal signs for
Steam and
Electric
Railways,
Telegraph,
Telephone
and
Express
Companies.

We supply them
in any sizes and
colors, for station
names, door signs,
route numbers, etc,

Guaranteed not to
fade or be affected
by the weather in
any way.

Acton Burrows

Limited

Enameled Iron Signs

70 Bond Street - Toronto

Dominion Bridge Company, Limited

Head Office and Works,
MONTREAL, P.Q.

Branch Offices and Works,
TORONTO, OTTAWA and WINNIPEG



Lachine Bridge

Engineers, Manufacturers and Erectors of Steel Structures.
CAPACITY 135,000 TONS.

Railway and Highway Bridges, Swing and Bascule Spans, Buildings of all kinds, Hemispherical Bottom and other Tanks, Transmission Poles and Towers, Riveted Pipe, Caissons, Barges, Turntables, Electric and Hand Power Cranes, Hoisting Appliances, Lift Locks, Hydraulic Regulating Gates, etc. Gear Cutting and General Machine Work.

Large Stock of Standard Structural Material at all Works.

"Claude" Oxygen Oxy-Acetylene

WELDING AND CUTTING PLANTS
MADE IN CANADA

All large railway shops are applying our systems to numerous uses. Welding frames, building up tires, boiler patches, welding flues. Also for cutting up scrap.

Cut out coupon for interesting booklet.

L'Air Liquide Society

*Three Canadian Distributing
Stations*

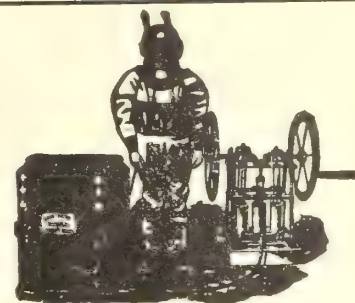
26 Boler Street, West Toronto
325 William Avenue, Winnipeg
Maisonneuve, Montreal

L'Air Liquide Society, Maisonneuve,
MONTREAL, P.Q.

Gentlemen,—Will you please send, without obligation to me, postpaid, your New Booklet?

Name
Address
Province Date
Business

R & M



JOHN DATE

Manufacturer of

Diving Apparatus

For Sale or Hire

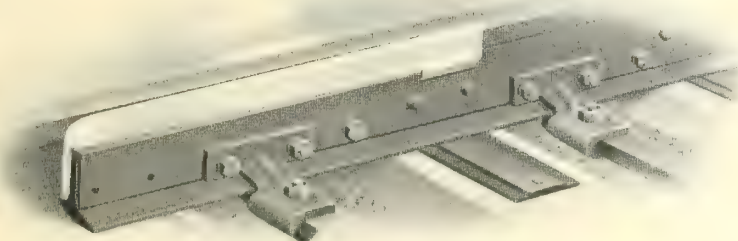
Brass Founder and Coppersmith
13-15 Concord St., Montreal

Insist on having

DREWRY'S American STYLE RICE BEER

The best beer—
without exception

E. L. Drewry, Ltd., Winnipeg



Ramapo Manganese Reinforced Switch Point

Note that the Switch Rail is continuous to the end of the Switch, leaving no joint to work loose. This construction in hard service will outwear all rail point five to one.

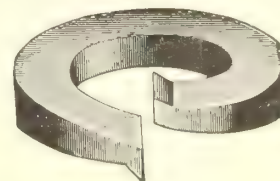
Canadian Ramapo Iron Works Limited

NIAGARA FALLS

ONTARIO

The Positive Lock Washer

is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks

The Positive Lock Washer Co.
Sole Mfrs., Newark, N.J.

F. H. HOPKINS & CO., Agents, Montreal

IMPERIAL BANK OF CANADA

Capital Authorized.....\$10,000,000
Capital Paid up.....7,000,000
Reserve Fund.....7,000,000

Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the World.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.

JOLIETTE STEEL CASTINGS

TRADE MARK REGD.

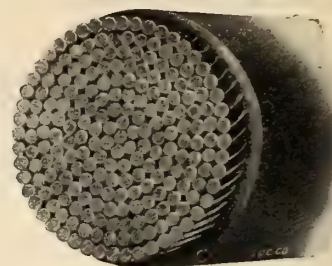
give a maximum of good service because each casting is made and treated especially for the work required of it. It will pay you to get acquainted and write us for prices. **Send in a trial order.** The uniformity and perfection of **Joliette Steel Castings** is your insurance against accidents and break-downs.

Joliette Steel Company Limited

Read Bldg.,
Montreal

Works :
Joliette, Que.

Allen General Supplies Limited
Toronto, Ont., Ontario Sales Agents.



5,000,000 C. M. Weatherproof Cable
(1/2 Actual Size)

Our Facilities

for the manufacture of electric wires and cables enable us to supply all kinds and sizes and in any quantity. No order is too small to merit our attention and none so large as to tax our facilities.

Write our nearest office about your requirements.

**Standard Underground Cable
Co. of Canada, Limited**
Hamilton, Ont.

Montreal, Que. Winnipeg, Man. Seattle, Wash.

**John Morrow Screw & Nut Co.,
Limited.**

BUSINESS AS USUAL

Set Screws
Cap Screws
Nuts, every variety
of finish
Twist Drills, etc.

Customers are requested to place their specifications with us as far ahead of their actual needs as possible so that we may give them good service.

INGERSOLL - ONTARIO

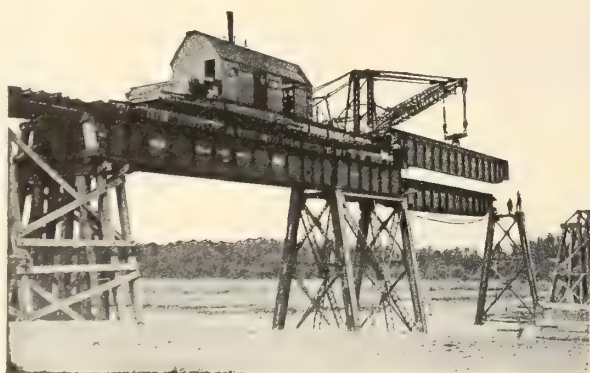
**Rails, Cars,
Locomotives**
and Contractors' Equipment

IMMEDIATE
SHIPMENT

John J. Gartshore
58 Front St. West
TORONTO

"BEATTY" HOISTS

For situation where the work is severe and the service exacting—"a Beatty always fills the bill"



Derrick car engined with an 8 x 12 four drum Beatty Hoist
placing an 80 foot deck plate girder span in Skugog
River Bridge.

Let us know your requirements for
Hoisting Engines, Steel Derricks, Derrick Irons, Electric Hoists, Clamshell
Buckets, Centrifugal Pumps, Dredges, Steel Scows, etc.

We will gladly send full information.

M. Beatty & Sons Limited - Welland

Agents: H. E. Plant, 1790 St. James St., Montreal. E. Leonard & Sons, St. John, N.B.
Robt. Hamilton & Co., Vancouver. Kelly Powell, McArthur Bldg, Winnipeg.

Engineers and ContractorsEdward F. Terry
PresidentFrederick Tench
V. P. & Treas.**The TERRY & TENCH CO., Inc.**
*Bridge Builders*General Contractors, Engineers and Designers
Grand Central Terminal NEW YORK**THE ARNOLD COMPANY**ENGINEERS—CONSTRUCTORS.
ELECTRICAL—CIVIL—MECHANICAL
REPORTS, DESIGN AND CONSTRUCTION
Complete Railway Shop and Terminal Properties—
Electrification of Steam Railroads.
OUR EXPERIENCE COVERS THIRTY-FIVE PLANTS
NEW YORK CHICAGO**ANGUS SINCLAIR, C.E.***Railway Contractor*Office: Imperial Bank Building,
King and Sherbourne Sts., Toronto.**Locomotive COALING STATIONS****ROBERTS AND SCHAEFER CO.**ENGINEERS AND CONTRACTORS
CHICAGO, U.S.A.**Patent Solicitors****PATENTS**

HERBERT J. S. DENNISON

Mechanical Engineer, Patent Attorney and Expert.
Patents, Trade Marks, Designs, Copyrights, and
Infringements, 20 Years experience in Patents
and Practical Engineering.Star Building, 18 King Street West, Toronto
WRITE FOR BOOKLET.**PATENTS SECURED OR OUR FEES RETURNED.**

Being next door to the Patent Office; we have personal interviews with Examiners, thus earlier allowance of your Patents. We have access to all Records and solicit the business of Manufacturers, Engineers and others who realize the advisability of having their Patent business transacted by Experts.

HAROLD C. SHIPMAN & CO.

Reg. Patent Attorneys. Ottawa, Canada

**BIG GAME
IN
CANADA****The Finest Hunting
Grounds in America**

ARE CONVENIENTLY REACHED VIA

CANADIAN PACIFICParticulars from Canadian Pacific Agents or
W. B. HOWARD, District Passenger Agent, Toronto.

Showing the construction of our geared jacks.

**Celebrated
"H & E"
Lifting Jack**Our Patent Ball-Bearing
Geared Jacks are Ideal in
Railroad and Heavy Construction Work.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

SHERBROOKE, QUE.

Sole Agents for Brakeshoes for Canada outside of B.C., Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for B.C., The B.C. Equipment Co., Vancouver, B.C. Sole Agent for Lifting Jacks for Canada, F. H. Hopkins & Co., Montreal.

High Grade Electric
STEEL CASTINGS
MANGANESE STEEL
For Crusher Jaws and Heavy
Wear Parts**BRONZE**

M.C.B. Standard Journal Bearings and Engine Bearings

Improved Reinforced Steel-Backed

BRAKESHOESLocomotive Driver and Truck
Shoes, Freight and Passenger
Car and Electric Car Shoes.ROBERT W. HUNT
THOS. C. IRVING JR.CHARLES WARNOCK
JAS. W. MOFFAT**Robert W. Hunt & Co., Limited****Consulting and Inspecting Engineers
Chemists and Metallurgists**Expert examination and tests of all steel and metal products;
Bridges, Buildings, Cement; Electrical and Mechanical Plant
Equipment; Rails and Fastenings; Cars; Locomotives; Pipe;
Castings; Forgings; Lumber; Paving Materials.Resident inspectors at all important manufacturing centres in
Canada, the United States and Great Britain.**REPORTS ON PROPERTIES AND PROCESSES.****Head Office and Laboratories:****McGill Building, - - - MONTREAL, QUE.****Branches: TORONTO VANCOUVER LONDON, ENGLAND****The Preston Car &
Coach Co., Limited****Preston, Ont.**

Manufacturers of

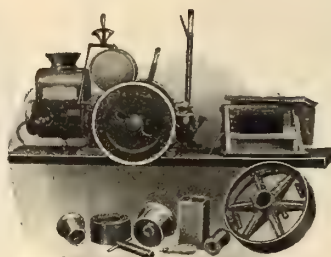
**Steam and Electric
Railway Cars and
Special Cars.**

ARE YOU ONE OF THE PUMPER

?

*A "Fairmont" on your car
makes the days work easy.*

FAIRMONT



ENGINES

Our catalogue of handcar engines, general purpose and roadmasters inspection cars tells you how to stop being a "pumper" and shows you how to save time for the company and work for yourself.

Thousands of section men, roadmasters and officials on Canadian, United States and South American railroads are now using FAIRMONT engines and motor cars.

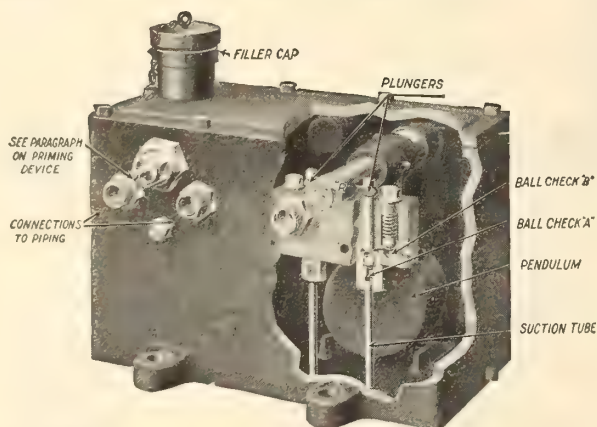
Our EASY PAYMENT plan makes it possible for you to own a Fairmont. Write for our catalogue and easy terms TODAY.

Quantity prices to railroads.

FAIRMONT GAS ENGINE & RAILWAY MOTOR CAR COMPANY

FORMERLY FAIRMONT MACHINE CO.

445 N. MAIN ST., FAIRMONT, MINN., U.S.A.



IT DOES NOT

- take up any room in the over-crowded cab.
- place any tax upon an over-loaded air pump.
- require frequent manipulation.

IT IS IT

- easily installed and can be placed where desired.
- absolutely automatic and simple.
- Decreases Flange Wear.
- Increases Tire Mileage.

WHAT ?

Detroit Automatic Flange Lubricator (Pendulum Type)

which is rendering satisfactory service, and saving dollars for so many leading railway systems.

Booklet FO-75 gives the facts boiled down for the busy railway man. Send for it.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.
WALKERVILLE, ONT.

Makers of the Stewart Carburetor.

The Ottawa Car Manufacturing Co., Limited

Builders of

Electric Cars, Snow
Sweepers and Plows

Also

Producers of Brass
Castings of Every
Description.

Slater Street - Ottawa

Electric Railway Supplies

Detroit Controller Checks.
Peerless Check Valves.
Hollis Safety Fender.
Bakelite Arch-leaves, Brush holders
Yokes and Rods.
Bakelite Washers and Asbestos
Board.
Gongs, Bells and Air Whistles.

Allen General Supplies, Ltd.
205 Yonge Street Toronto

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies.

AERATED WATERS

E. L. Drewry

AIR BRAKES AND FITTINGS

Canadian Westinghouse Co.

ALES

E. L. Drewry

ANGLE BARS

Steel Co. of Canada

ASBESTOS

Can. H. W. Johns-Manville Co.

AUTOMOBILES

Preston Car & Coach Co.

AXLES

Nova Scotia Steel and Coal Co.

Jas. W. Pyke & Co.

Steel Co. of Canada.

BATTERIES, DRY

Canadian National Carbon Co.

BATTERIES, SIGNAL

Canadian National Carbon Co.

BATTERIES, STORAGE

Canadian National Carbon Co.

BATTERIES, TRACK

Canadian National Carbon Co.

BATTERY SUPPLIES

Canadian National Carbon Co.

BATTERP SUPPLIES

Canadian National Carbon Co.

BOILER COMPOUND

Dearborn Chemical Co. of Canada

BOILERS

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

BOILERS, PORTABLE

Polson Iron Works

BOILERS, STATIONARY AND MARINE

Polson Iron Works

BOILERS, STEAM

Polson Iron Works

BOILERS, WATER TUBE

Babcock & Wilcox

Polson Iron Works

BOLTS AND NUTS

Steel Co. of Canada

BOLTS, TRACK

F. H. Hopkins & Co.

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

BORERS, CAR WHEEL

John Bertram & Sons Co.

BRAKE BEAMS

Buffalo Brake Beam Co.

BRAKE SHOES

Canada Iron Foundries

Canadian Brakeshoe Co.

Dominion Brakeshoe Co.

BRAKE SHOES, LOCOMOTIVE DRIVER

Canada Iron Foundries

BRIDGE BUILDERS

Terry & Tench Co.

BRIDGE NUMBERS

Acton Burrows, Limited

BRIDGES

Canadian Bridge Co.

Dominion Bridge Co.

BRUSHES, CARBON, GRAPHITE AND METAL COMPOSITION

Canadian National Carbon Co.

BUCKETS, COAL, ORE AND CONCRETE

M. Beatty & Sons

Brown Hoisting Machinery Co.

F. H. Hopkins & Co.

BUILDINGS, STEEL

Canadian Bridge Co.

Dominion Bridge Co.

BUMPING POSTS

F. H. Hopkins & Co.

CABLES, ELEC., RUBBER, PAPER, FIBRE INSULATED

Standard Und. Cable Co. of Can.

CARBONS, ARC LAMP, FLARE

ARC AND PHOTOGRAPHIC

Canadian National Carbon Co.

CAR CLEANER

Allen General Supplies, Ltd.

CAR SIGNAL SYSTEMS

Ohio Brass Co.

CARS

Eastern Car Co.

Hart-Otis Car Co.

National Steel Car Co.

Ottawa Car Mfg. Co.

Preston Car & Coach Co.

CASTINGS, BRASS

Canada Iron Foundries

Canadian Bronze, Limited

CASTINGS, CAR

Canada Iron Foundries

Dominion Brakeshoe Co.

CASTINGS, IRON

Canada Iron Foundries

Hunt-Spiller Manufacturing Corp.

CASTINGS, IRON AND STEEL

Dominion Brakeshoe Co.

Dominion Steel Foundry Co.

CASTINGS, MALLEABLE

Taylor & Arnold

CASTINGS, MANGANESE STEEL

Canadian Steel Foundries, Ltd.

CASTINGS, STEEL

Dominion Steel Foundry

Joliette Steel Co.

CATERINARY MATERIALS

Ohio Brass Co.

CHAINS

B. J. Coghlin Co.

F. H. Hopkins & Co.

CLOSETS, CAR

Duner Co.

COAL

Nova Scotia Steel and Coal Co.

COAL CHUTES

Roberts & Schaefer Co.

COAL DOCK BRIDGES

Roberts & Schaefer Co.

COAL MINING AND WASHING PLANTS

Roberts & Schaefer Co.

COALING STATIONS

Roberts & Schaefer Co.

COMPRESSORS, AIR

Canadian Ingersoll-Rand Co.

F. F. Hopkins & Co.

CONCRETE MIXERS & ROCK CRUSHERS

F. H. Hopkins & Co.

CONTRACTORS' SUPPLIES

F. H. Hopkins & Co.

Rice Lewis & Sons

CONVEYORS, COAL AND ASH

Babcock & Wilcox

COPPER, RODS AND WIRE

Standard Und. Cable Co. of Can.

COUPLERS, CAR & LOCOMOTIVE

Canadian Steel Foundries, Ltd.

Ohio Brass Co.

Taylor & Arnold

CRANES

Brown Hoisting Machinery Co.

CRANES, WRECKING

F. H. Hopkins & Co.

CRANES, ELECTRIC

Babcock & Wilcox

Dominion Bridge Co.

F. H. Hopkins & Co.

CRANES, TRAVELLING

F. H. Hopkins & Co.

CROWBARS

B. J. Coghlin Co.

CULVERTS

Pedlar People, Ltd.

CURTAINS AND FIXTURES, CAR

Du Pont Fabrikoid Co.

Preston Car & Coach Co.

CUTS

Acton Burrows, Limited

DERRICKS

F. H. Hopkins & Co.

DIES

Butterfield & Co.

DITCHERS

M. Beatty & Sons

F. H. Hopkins & Co.

DIVING OUTFITS

John Date

F. H. Hopkins & Co.

DOOR SIGNS

Acton Burrows, Limited

DRAFT GEAR

Standard Coupler Co.

DREDGES

M. Beatty & Sons

F. H. Hopkins & Co.

Polson Iron Works

DRILLS

Canadian Ingersoll-Rand Co.

John Morrow Screw & Nut Co.

DRILLS, AIR

F. H. Hopkins & Co.

Independent Pneumatic Tool Co.

DRILLS, WELL

F. H. Hopkins & Co.

DUMP CARS, CONTRACTORS'

Hart-Otis Car Co.

F. H. Hopkins & Co.

DYNAMO AND ELECTRIC CASTINGS

Dominion Brakeshoe Co.

ECONOMIZERS

Babcock & Wilcox

ELECTRIC CAR ROUTE SIGNS

Acton Burrows, Limited

Preston Car & Coach Co.

ENAMELED IRON SIGNS

Acton Burrows, Limited

ENGINEERS

Arnold Co.

Roberts & Schaefer Co.

Angus Sinclair & Co.

ENGINES, AUTOMATIC

Polson Iron Works

ENGINES, HOISTING

M. Beatty & Sons

Canadian Ingersoll-Rand Co.

F. H. Hopkins & Co.

Polson Iron Works

ENGINES, STATIONARY AND MARINE

Polson Iron Works

ENGINES, STEAM

F. H. Hopkins & Co.

EXPRESS OFFICE SIGNS

Acton Burrows, Limited

FARE BOX HOLDERS

Coleman Fare Box Co.

FARE BOXES, P.A.Y.E. OPERATION

Coleman Fare Box Co.

FARE BOXES, PORTABLE AND STATIONARY

Coleman Fare Box Co.

FILES

Nicholson File Co.

FORGINGS

Nova Scotia Steel & Coal Co.

Steel Co. of Canada

FROGS

Canadian Ramapo Iron Works

Drew Electric & Mfg. Co.

GAUGE COCKS

Ohio Brass Co.

GAUGES, LOCOMOTIVE

Taylor & Arnold

GEARS AND PINIONS

Allen General Supplies, Ltd.

GRATES, SHAKING

Babcock & Wilcox

Polson Iron Works

HAMMERS, CAST STEEL

Dominion Brakeshoe Co.

F. H. Hopkins & Co.

HANDCARS

F. H. Hopkins & Co.

Rice Lewis & Sons

HANGERS, CABLE

Standard Und. Cable Co. of Can.

HEADLIGHTS

Ohio Brass Co.

HEATING, CAR

Chicago Car Heating Co.

Consolidated Car Heating Co.

HOISTS, PNEUMATIC

Taylor & Arnold

HOISTS, STEAM

M. Beatty & Sons

HOOKS

Steel Co. of Canada

HOPPERS, CAR, WET OR DRY

Duner Co.

HOSE, AIR BRAKE & STEAM

Can. H. W. Johns-Manville Co.

ILLUSTRATIONS

Acton Burrows, Limited

INSPECTIONS

R. W. Hunt & Co.

INSULATORS, PORCELAIN

Drew Electric & Mfg. Co.

Ohio Brass Co.

INSURANCE, ACCIDENT

Imperial Guar. & Acc. Ins. Co.

INTERLOCKING PLANT AND SIGNALS

Canadian Steel Foundries, Ltd.

Gen. Railway Signal Co. of Can.

"DREW" Electric Railway Specialties

Overhead Materials
Frogs
Samson Splicers

Curve Suspensions
Drew Safety Mirrors
Drew Pole Sleeves

Feed-in Hangers
Strain Plates
Cable Insulation

Cable Splicing
Cable Insulators
Strain Insulators

Each spells Electric Railway Economy and Better Service. OUR CATALOG tells why you need these better operation devices. Write for your copy today.

DREW ELECTRIC & MFG. COMPANY, Indianapolis, Ind.

C. E. A. CARR CO.

Canadian Representatives :
2 Toronto Street

TORONTO, ONT.

The Imperial Guarantee and Accident Insurance Co. of Canada

Imperial Protection Accident and Sickness Insurance
Guarantee Bonds Plate Glass and Automobile Insurance
Automobile Fire Insurance

A Strong Canadian Company

Head Office, 44 King St. W., Toronto, Ont.

Branch Offices:

Montreal, Que., Canada Life Bldg.

Winnipeg, Man., Merchants Bank Bldg.

Calgary, Alta., Canada Life Bldg.

Vancouver, B.C., 546 Pender St. W.

Sessions-Standard Friction Draft Gear

Simplest and Best

Both
Made by
Standard Coupler Co.
30 CHURCH STREET, NEW YORK

Standard Steel Platforms

Used by all Canadian Railways

CHICAGO CAR HEATING CO.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES

Canadian Factory and Office—61 Dalhousie St., Montreal A. D. BRUCE, Agent

GENERAL OFFICES:
RAILWAY EXCHANGE, CHICAGO, U.S.A.
NEW YORK, GRAND CENTRAL TERMINAL BLDG.
ATLANTA GA., CANDLER BLDG.
WASHINGTON, D.C., MUNSEY BLDG.

C. W. Sherman, Pres. and Gen. Mgr.

F. W. Ballie, Vice-Pres.

A. G. Wright, Secy.

Dominion Steel Foundry Company, Limited, Hamilton, Ont.

Locomotive Frames

Car Bolsters

Car Castings

Heavy Machinery Castings

Consolidated

The ORIGINAL electric heater.
Patented ventilated core. Glazed.
Patented return lead with connections at one end.
Light pressed steel construction.
Rust-proofed.
In use on 70,000 out of 90,000 cars now operating.

Consolidated Car-Heating Co.
New York — Albany — Chicago
DAWSON & CO., Agents, MONTREAL

JOHNS-MANVILLE PRODUCTS

Roofing and Sill Coverings
Packings Gaskets
Pipe Coverings Hair Felt
Transite Smoke Jacks
Transite Asbestos Wood
Waterproofing
Cork
Fibre Conduit
Steam Traps



Magnesia & Fire Felt Locomotive Lugging
Flexible Armored Squirt
Suction, Tank, Hose
Air Brake Expander Ring
J-M Manual Slack Take-up for Air Brakes
Steel Car Insulation
Underground Conduit

Asbestos Cements
Brake Linings and Asbestos
Metallic Blocks
Electrical Supplies
Mastic Flooring
Fire Extinguishers
Vitribestos Stack Lining
Refrigerator Car Insulation
Asbestos Fire Felt

THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED

TORONTO

MONTREAL

WINNIPEG

VANCOUVER

N I C K E L



Shot—High and low carbon.

Ingots—Two sizes, 25 lbs., 50 lbs.

Electrolytic Nickel—99.80 p.c.

Prime Metals for the Manufacture of Nickel Steel, German Silver, Anodes and all remelting purposes. Our Nickel is produced as Rods, Sheets, Strip Stock, Wire and Tubes.

We are SOLE PRODUCERS of this natural stronger-than-steel, non-corrodible alloy. Manufactured forms are Rods, Castings, Tubes, Sheets, Strip Stock and Wire.

Send Inquiries Direct to Us.

The International Nickel Co., 43 Exchange Place, N.Y.

Car Closets

Flush or Dry

DUNER CO.

101 S. CLINTON ST.
CHICAGO

MARINE PAINTS AND VARNISHES

Toch Bros.
MARINE REPAIRS
 Goldschmidt Thermit Co.
MARINE SUPPLIES
 Rice Lewis & Sons
METALS
 Goldschmidt Thermit Co.
METAL WORK, STRUCTURAL
 Canadian Bridge Co.
 Dominion Bridge Co.
 Jas. W. Pyke & Co.
MILEPOST NUMBERS
 Acton Burrows, Limited
MONEL METAL
 International Nickel Co.
MOTOR CARS
 Fairmont Gas Engine and Ry.
 Motor Car Co.
MOTORS, TURNTABLE
 Taylor & Arnold
NAILS, CUT AND WIRE
 Steel Co. of Canada
NICKEL, SHEET, ROD, WIRE & TUBE
 International Nickel Co.
NUMBERS
 Acton Burrows, Limited
NUT LOCKS
 Positive Lock Washer Co.
OFFICE FITTINGS
 Can. Office & School Furn. Co.
OFFICE SIGNS
 Acton Burrows, Limited
OILS
 Galena-Signal Oil Co.
PACKING
 Canuck Supply Co.
 Garlock Packing Co.
PAINTS
 Toch Bros.
PATENT ATTORNEYS
 H. J. S. Dennison
 H. C. Shipman & Co.
PILE DRIVERS, RAILWAY
 F. H. Hopkins & Co.
PIPE, STEAM
 Babcock & Wilcox
PIPE STOCKS
 Butterfield & Co.
PIPE, WROUGHT, LEAD AND GALVANIZED
 Steel Co. of Canada
PLANERS
 John Bertram & Sons Co.
 Canada Machinery Corporation
PLATFORMS, STEEL
 Standard Coupler Co.
PLOUGH, CONTRACTORS'
 F. H. Hopkins & Co.
PORTER
 E. L. Drewry
PUMPS
 F. H. Hopkins & Co.
PUMPS, CENTRIFUGAL
 M. Beatty & Sons
 F. H. Hopkins & Co.
 R. D. Wood & Co.
PUTTY
 Steel Co. of Canada
RAIL BONDS
 Ohio Brass Co.
 Elec. Railway Improvement Co.
RAIL BENDERS
 Canadian Steel Foundries, Ltd.
RAIL JOINTS
 Goldschmidt Thermit Co.
 The Rail Joint Co. of Canada
RAILS, NEW
 Algoma Steel Corporation
 Dominion Iron & Steel Co.
 J. J. Gartshore
 F. H. Hopkins & Co.

RAILS FOR RELAYING

J. J. Gartshore
RAILWAY SUPPLIES
 Can. H. W. Johns-Manville Co.
 Franklin Railway Supply Co.
 F. H. Hopkins & Co.
 Rice Lewis & Son
 The Hiram L. Piper Co.
REAMERS
 Butterfield & Co.
REPLACERS, CAR AND LOCOMOTIVE
 F. H. Hopkins & Co.
RIVETS
 Steel Co. of Canada, Ltd.
RIVETTERS
 Canadian Ingersoll-Rand Co.
ROCK CRUSHERS
 F. H. Hopkins & Co.
ROPE, DERRICK
 Dominion Wire Rope Co.
ROOFING, CAR
 Franklin Railway Supply Co.
 F. H. Hopkins & Co.
RUBBER GOODS
 Can. Consolidated Rubber Co.
SANDERS, PNEUMATIC
 Ohio Brass Co.
SAWS, HACK
 Diamond Saw & Stamping Co.
SCOWS, DUMP AND DECK
 M. Beatty & Sons
SCREW PLATES
 Butterfield & Co.
SCRAPERS, WHEEL AND DRAG
 F. H. Hopkins & Co.
SCREWS, WOOD AND MACHINE
 John Morrow Screw and Nut Co.
 Steel Co. of Canada
SEMAPHORE ARMS
 Acton Burrows, Limited
SHEET PILE DRIVERS
 Canadian Ingersoll-Rand Co.
SHIPS
 Polson Iron Works
SIGNAL HOUSE NUMBERS
 Acton Burrows, Limited
SIGNALS
 Gen. Railway Signal Co. of Can.
 The Hiram L. Piper Co.
SIGNS
 Acton Burrows, Limited
SNOW PLOUGHS
 F. H. Hopkins & Co.
SPIKES, RAILWAY, SHIP OR PRESSED
 Nova Scotia Steel and Coal Co.
 Steel Co. of Canada
SPLICING TUBES AND COMPOUNDS
 Drew Electric & Mfg. Co.
 Standard Und. Cable Co. of Can.
SPREADER CARS
 F. H. Hopkins & Co.
SPRINGS
 Canadian Steel Foundries, Ltd.
 B. J. Coghlin & Co.
SPRINKLERS, ELECTRIC
 Preston Car & Coach Co.
STAPLES
 Steel Co. of Canada
STATION NAME SIGNS
 Acton Burrows, Limited
STAYBOLT IRON
 Taylor & Arnold
STAYBOLTS, FLEXIBLE
 Flannery Bolt Co.
STAYBOLTS, LOCOMOTIVE
 Flannery Bolt Co.
STAYBOLT TAPS
 Butterfield & Co.
STEAM HAMMERS
 John Bertram & Sons Co.

STEAM SHOVELS

M. Beatty & Sons
 F. H. Hopkins & Co.
STEAMSHIP SIGNS
 Acton Burrows, Limited
STEEL
 Nova Scotia Steel and Coal Co.
STEEL FIRE BOX
 Taylor & Arnold
 Canadian Steel Foundries, Ltd.
STEEL FOR AXES
 Canadian Steel Foundries, Ltd.
STEEL FOR SAWS
 Canadian Steel Foundries, Ltd.
STEEL FOR TIRES
 Steel Co. of Canada
STEEL SHAFTING
 Nova Scotia Steel and Coal Co.
STEEL PLATES
 Jas. W. Pyke & Co.
STEEL, TOOL
 Canadian Steel Foundries, Ltd.
 F. H. Hopkins & Co.
STOKERS, MECHANICAL
 Babcock & Wilcox
STRAINERS
 Babcock & Wilcox
SUPERHEATERS
 Babcock & Wilcox
 Locomotive Superheater Co.
SWITCH TARGETS
 Acton Burrows, Limited
SWITCHES
 Canadian Ramapo Iron Works
TACKS
 Steel Co. of Canada
TANKS AND TANK FIXTURES
 F. H. Hopkins & Co.
 Polson Iron Works
TAPS
 Butterfield & Co.
TELEGRAPH AND TELEPHONE OFFICE SIGNS
 Acton Burrows, Limited
TERMINALS, JUNCTION BOXES
 Standard Und. Cable Co. of Can.
THERMIT
 Goldschmidt Thermit Co.
TIE PLATES
 Algoma Steel Corporation
 B. J. Coghlin
 Nova Scotia Steel and Coal Co.
 Steel Co. of Canada
TICKET CASES
 Canadian Office & School Fur. Co.
TIRES, STEEL
 Jas. W. Pyke & Co.
TOOLS AND SUPPLIES
 F. H. Hopkins & Co.
 Pratt & Whitney Co.
TOOLS, CAST STEEL
 Dominion Brakeshoe Co.
TOOLS, TRACK
 John Bertram & Sons Co.
 Canadian Steel Foundries, Ltd.
 B. J. Coghlin Co.
 F. H. Hopkins & Co.
TOOLS, PNEUMATIC
 Canadian Ingersoll-Rand Co.
 Independent Pneumatic Tool Co.
TRAMWAY EQUIPMENT
 J. J. Gartshore
TRACK EQUIPMENT
 Canadian Ramapo Iron Works
 F. H. Hopkins & Co.
TROLLEY BASES
 Allen General Supplies, Ltd.
 Ohio Brass Co.
 Trolley Supply Co.
TROLLEY CATCHERS
 Allen General Supplies, Ltd.
 Ohio Brass Co.
 Trolley Supply Co.
TROLLEY GUARDS
 Ohio Brass Co.
 Trolley Supply Co.

TROLLEY RETRIEVERS

Allen General Supplies, Ltd.
 Ohio Brass Co.
 Trolley Supply Co.
TROLLEY WHEELS
 Star Brass Works
TRUCKS, ELECTRIC CAR
 Canadian Steel Foundries, Ltd.
TRUSSES, ROOF
 Canadian Bridge Co.
 Dominion Bridge Co.
TUBES, BOILER
 F. H. Hopkins & Co.
TUBE CLEANERS
 F. H. Hopkins & Co.
TURNBUCKLES
 Canadian Steel Foundries, Ltd.
TURNABLES
 Canadian Bridge Co.
 Dominion Bridge Co.
UPHOLSTERY, CAR
 Du Pont Fabrikoid Co.
VALVES
 Canadian Detroit Lubricator Co.
 R. D. Wood & Co.
VALVES, ANGLE AND GLOBE
 Ohio Brass Co.
VALVES, BRASS GATE
 Ohio Brass Co.
VALVES, LOCOMOTIVE POP
 Taylor & Arnold
VARNISHES
 Berry Bros.
VESSELS
 Polson Iron Works
WASHERS
 Steel Co. of Canada
WASTE
 B. J. Coghlin Co.
WATER SOFTENERS AND PURIFIERS
 Babcock & Wilcox
 Dearborn Chemical Co. of Can.
WELDING
 Goldschmidt Thermit Co.
 L'Air Liquide Society
WHEELBARROWS
 F. H. Hopkins & Co.
WHEEL GRINDERS
 Griffin and Brinkerhoff
WHEELS, CAR
 Canada Iron Foundries
 Jas. W. Pyke & Co.
WHEELS, LOCOMOTIVE
 Canada Iron Foundries
WHITE LEAD
 Carter White Lead Co.
 Steel Co. of Canada
WIRE AND WIRE ROPE
 Dominion Wire Rope Co.
WIRE, BARE COPPER
 Standard Und. Cable Co. of Can.
 Steel Co. of Canada
WIRE, BRASS, IRON AND STEEL
 Steel Co. of Canada
WIRE, INSULATED COPPER
 Standard Und. Cable Co. of Can.
 Steel Co. of Canada
WIRE GOODS, BRIGHT
 Steel Co. of Canada
WIRE, TELEGRAPH AND TELEPHONE
 Standard Und. Cable Co. of Can.
 Steel Co. of Canada
WIRE, TELEGRAPH AND TROLLEY
 Standard Und. Cable Co. of Can.
WRENCHES, CAST STEEL
 Dominion Brakeshoe Co.
YACHTS
 Polson Iron Works

The Canadian Bridge Co., Limited

Walkerville, Ontario

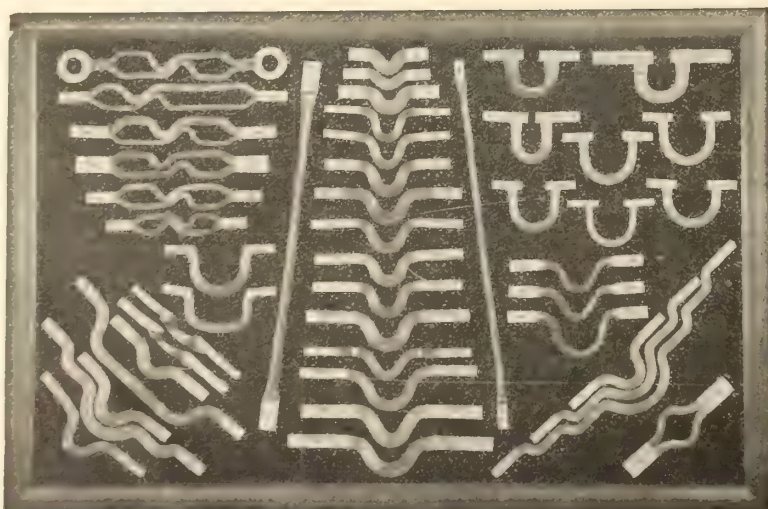
Locomotive
 Turntables
 Roofs
 Steel Buildings

Manufacturers of
 Railway and Highway
BRIDGES

Structural
 Iron Work
 of all
 Descriptions

Alphabetical List of Advertisers

A		M	
Algoma Steel Corporation	21	Midland Dry Dock Co.	18
Dearborn Chemical Co. of Canada ..	2	Montreal Locomotive Works	12
Dennison, H. J. S.	79	Morrow, John, Screw & Nut Co. .	78
Allen General Supplies, Ltd.	80	N	
Arnold Co.	79	National Steel Car Co.	8
B		Nicholson File Co.	19
Babcock & Wilcox	74	Norton, A. O., Inc.	13
Beatty, M. & Sons, Co.	78	Northern Electric Co.	9 and 70
Berry Bros.	17	Nova Scotia Steel & Coal Co. ...	85
Bertram, John, & Sons, Co.	1	O	
Bradstreet Company	73	Ohio Brass Co.	11
Brown Hoisting Machinery Co. .	4	Ottawa Car Manufacturing Co. .	80
Buffalo Brake Beam Co.	25	P	
Burrows—Acton Burrows, Ltd. .	76	Pedlar People, Ltd.	12
Butterfield & Co.	75	Piper, The Hiram L., Co.	71
C		Polson Iron Works	14
Canada Iron Foundries, Ltd. ...	23	Positive Lock Washer Co.	77
Canadian Brakeshoe Co.	79	Pratt & Whitney Co. of Canada .	24
Canadian Bridge Co.	83	Preston Car & Coach Co.	79
Canadian Bronze, Ltd.	71	Pyke, J.W., & Co.	77
Canadian Consolidated Rubber Co.	26	R	
Canadian Detroit Lubricator Co.	80	Rail Joint Co. of Canada	20
Canadian Fairbanks-Morse Co. .	71	Roberts & Schaefer Co.	79
Canadian Government Railways .	25	S	
Canadian H. W. Johns-Manville		Shipman, Harold C., & Co.	79
Co.	82	Sinclair, Angus	79
Canadian Ingersoll-Rand Co. .	11	Standard Coupler Co.	82
Canadian Marconi Co.	74	Standard Underground Cable Co.	
Canadian National Carbon Co. .	21	of Canada	78
Canadian Northern Railway	19	Star Brass Works	23
Canadian Office & School Furni-		Steel Co. of Canada	5
ture Co.	73	Steel Equipment Co.	16
Canadian Pacific Railway	79	T	
Canadian Ramapo Iron Works .	77	Taylor & Arnold	23
Canadian Steel Foundries, Ltd. .	17	Terry & Tench Co.	79
Canadian Westinghouse Co.	2	Toch Bros.	73
Canuck Supply Co.	3	Trolley Supply Co.	22
Carter White Lead Co.	16	W	
Chicago Car Heating Co.	82	Western Dry Dock & Shipbuild-	
Coghlin, B. J., Co.	24	ing Co.	72
Commercial Acetylene Weldin Co.	74	Wood, R.D., & Co.	69
Consolidated Car Heating Co. ...	82	*Advertisements. marked. with. an	
D		asterisk appear in alternate issues.	
Date, John	71		
Diamond Saw & Stamping Works	75		
Dominion Brakeshoe Co.	24		
E			
Eastern Car Co.	86		
Electric Railway Improvement Co.	84		
F			
Fairmont Gas Engine & Ry. Mo-			
tor Car Co.	80		
Flannery Bolt Co.	13		
Franklin Railway Supply Co.	14		
G			
Galena-Signal Oil Co.	6		
Garlock Packing Co.	18		
Gartshore, J. J.	78		
Geenal Ry. Signal Co. of Canada	7		
Goldschmidt Thermit Co.	15		
Graand Trunk Railway	15		
Griffin & Brinkerhoff	77		
H			
Hart-Otis Car Co.	10		
Hopkins, F. H., & Co.	10		
Hunt, Robert W. & Co.	79		
Hunt-Spiller Mrg. Corporation ..	76		
I			
Imperial Bank of Canada	77		
*Imperial Guar. & Acc. Ins. Co. .	82		
Independent Pneumatic Tool Co. .	25		
International Correspond. Schools	75		
International Nickel Co.	82		
J			
Joliette Steel Co.	78		
L			
L'Air Liquide Society	77		
Lewis, Rice, & Son	20		
Locomotive Superheater Co.	22		



Electric Weld Rail Bonds

meet every condition.

Neither do they corrode at the terminals.

The Electric Railway Improvement Co.

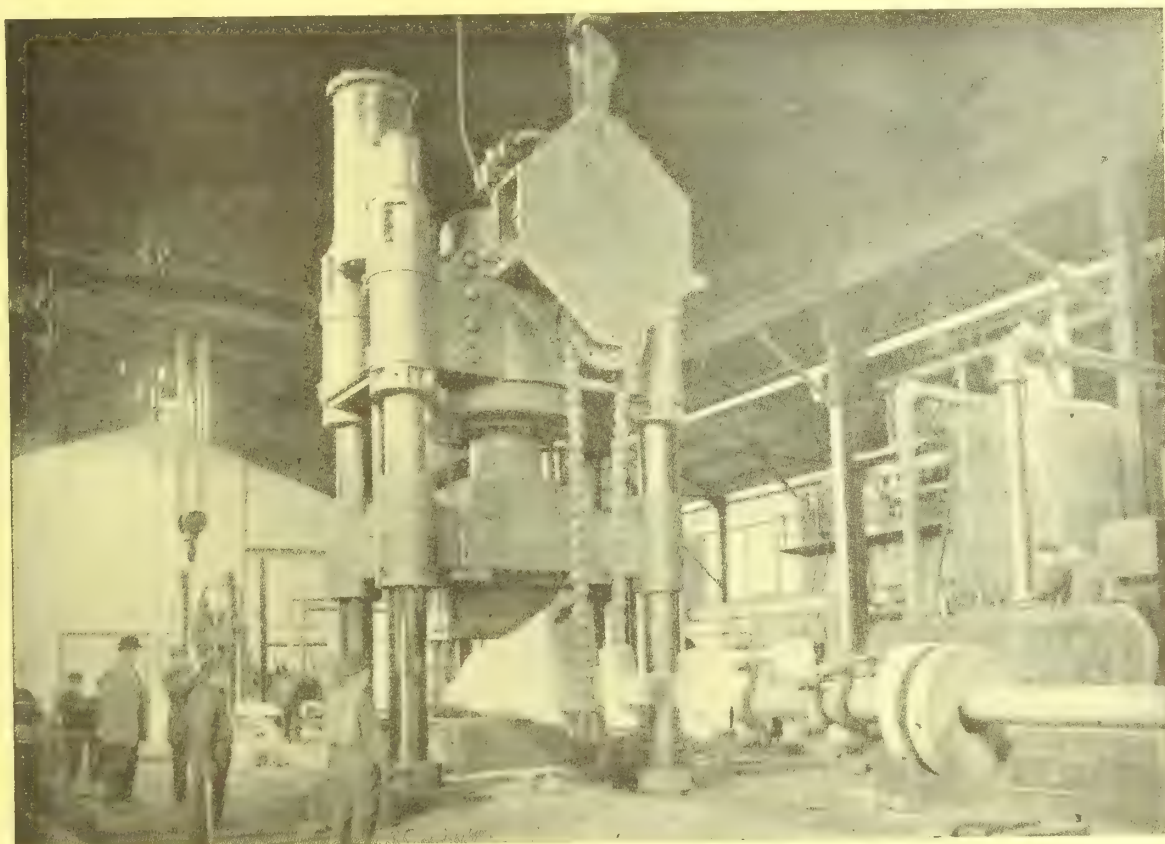
Cleveland, Ohio

Nova Scotia Steel & Coal Company

LIMITED

Manufacturers of Steel for Shrapnel Shells and Admiralty Forgings | Only Company in Canada producing Steel Ingots by the "Harmet" liquid process

Can supply Forgings up to 40 Tons in weight to all Admiralty and Lloyd's Tests and Specifications



FORGING A RUDDER FRAME

Why "Harmet" Liquid Process Steel Ingots are Superior to Ordinary Steel Ingots:—

1. Prevention of cracks due to shrinkage; of internal stresses and resulting cracks and fissures.
2. Early cessation in the crystallization of the metal, and the production of fine crystallization without cleavage planes.
3. Lessening of segregation, i.e., reduction of tendency of carbon and other impurities to concentrate in the central and upper parts of the ingot.
4. Prevention of "pipes" or interior cavities, and thus preservation of absolute solidity in the ingot.
5. Improvement in physical properties.
6. Reduction in waste of ingot.

OUR modern Steam Hydraulic Forge Shop at New Glasgow, N.S., part of which is shown above, and our large Steel Plant at Sydney Mines, N.S., equal the very best in America.

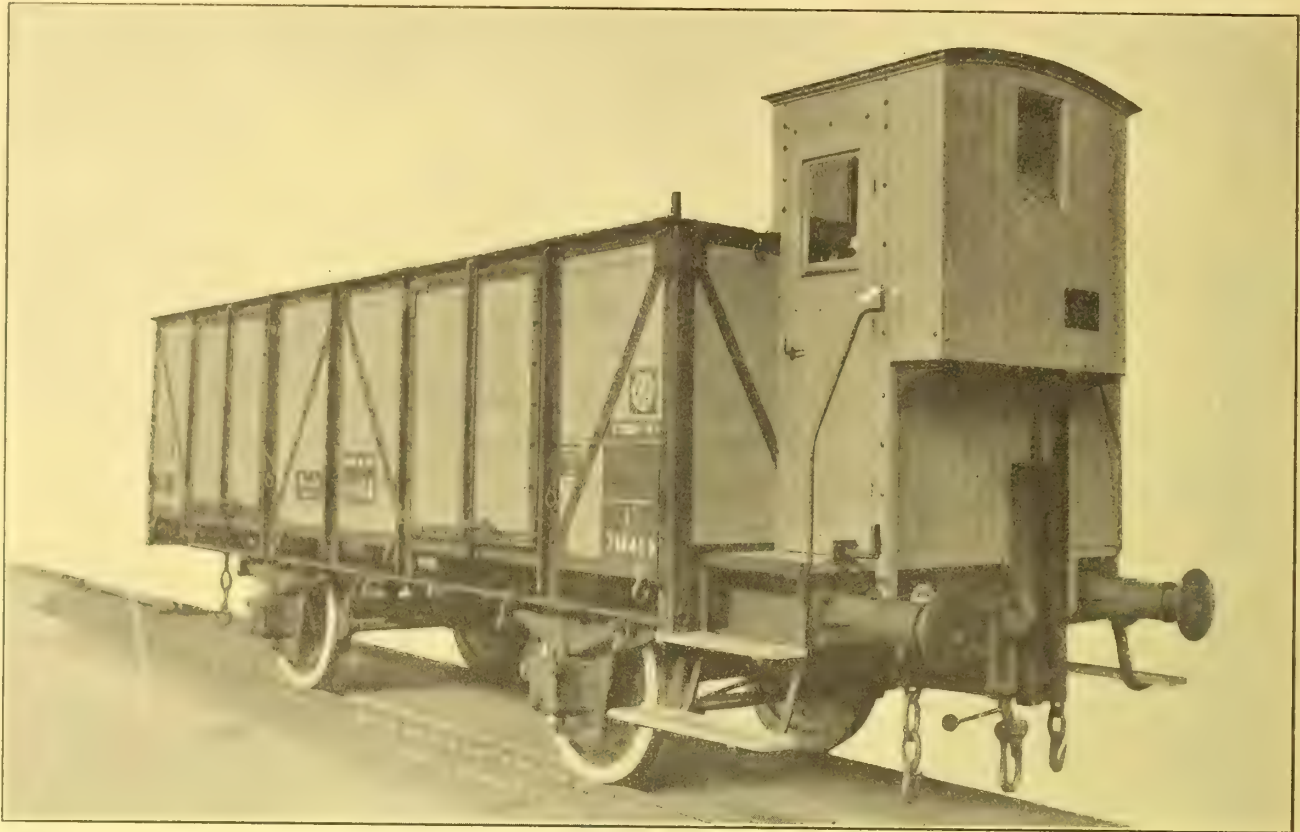
On the shortest notice, we can supply forgings of all shapes and sizes, made of ordinary or "Harmet" fluid compressed open-hearth steel, and satisfying the most severe specifications.

Our forges are modern in every respect—designed and installed after close study of the latest developments in all countries. Moreover, we produce the highest grades of steel by the most approved methods. It has always been the policy of "Scotia" to hold a position in the front rank of trade, and by the recent additions to plant, this policy has been maintained in a practical manner, bringing "Scotia's" equipment abreast of the best foreign forges.

For prices and full particulars, write to

Head Office, NEW GLASGOW, N.S.

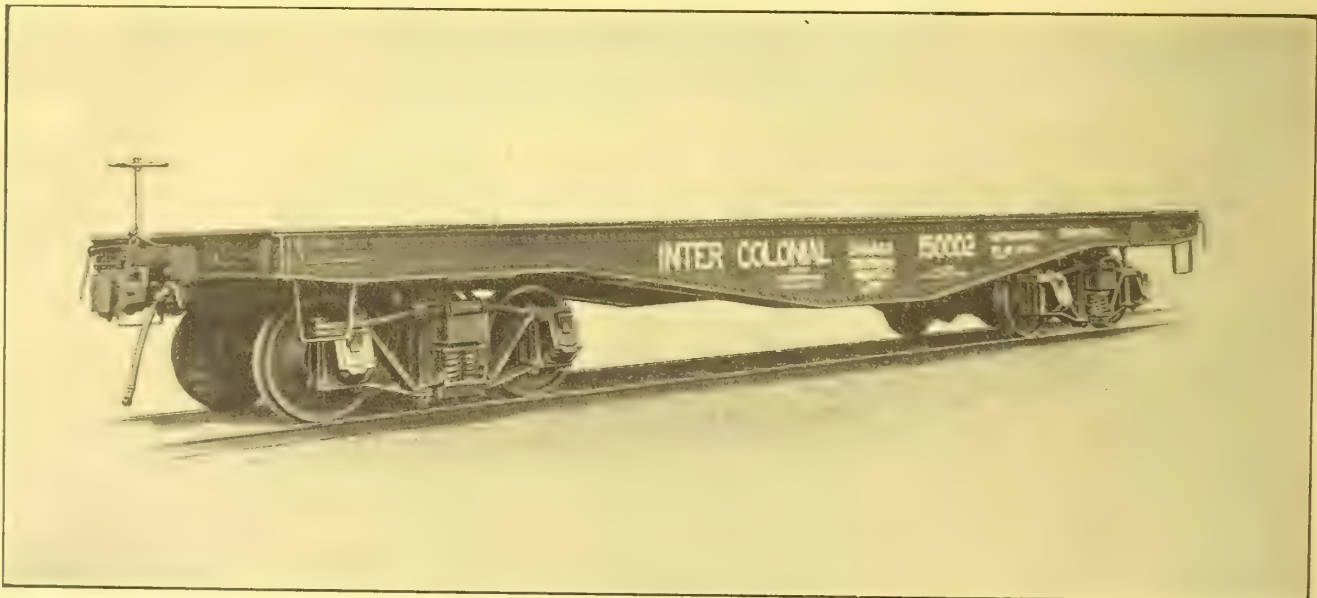
Western Sales Office, Room 14, Windsor Hotel, Montreal



ONE OF 2,000 GONDOLA CARS NOW UNDER CONSTRUCTION FOR THE FRENCH GOVERNMENT.

FREIGHT CARS TO FOREIGN ORDER

We have unexcelled water and rail shipping facilities for the export of freight cars of all types abroad or to United States markets. Our manufacturing capacity reaches to 40 cars per day. Although fully employed in filling and conducting negotiations for further foreign orders, our exceptional output facilities enable us both to take care of these and others in the order in which they are received.



75 TON SPECIAL PIT CAR FOR CANADIAN GOVERNMENT RAILWAYS.

FLAT CARS, CABOOSES, AND MINE CARS

We make a specialty of Flat Cars, Caboose and Mine Cars for both Home and Foreign Markets in Wood, Steel Frame or "All-Steel" and shall be pleased to quote against all capacity requirements and quantities.

Eastern Car Company, Limited

General Offices and Works, New Glasgow, N.S.

Montreal Office, Room 14 Windsor Hotel

